

recommended

2475/3929

(Vol. 1)

Anderson Thesis

2 Vols

buy

No. of Items 3  
Lorraine Davies  
said there were  
only 2 Vols

MONASH UNIVERSITY

THESIS ACCEPTED IN SATISFACTION OF THE  
REQUIREMENTS FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY

ON..... 8 October 1999 .....

.....  
Sec. Ph.D. and Scholarships Committee

Under the Copyright Act 1968, this thesis must be used only under the normal conditions of scholarly fair dealing for the purposes of research, criticism or review. In particular no results or conclusions should be extracted from it, nor should it be copied or closely paraphrased in whole or in part without the written consent of the author. Proper written acknowledgment should be made for any assistance obtained from this thesis.

# ADDENDUM

- p. 15, paragraph two: *vocabulary many*, should be *vocabulary, many*
- p. 24, paragraph two: *relatedness*, should be *relatedness*
- p. 26, paragraph four: *is has four sections* should be *has three sections*
- p. 40, paragraph two: *since in general personality has occupied as* should be *since, in general, personality has occupied a*
- p. 43, paragraph one: *Allport was on the same wavelength as Kelly but Kelly did not articulate this clearly* should be *Allport was on the same wavelength as Kelly; however, Kelly did not make plain their shared preference for idiographic and nomothetic methods.*
- p. 55, paragraph one: *pare excellence* should be *par excellence*
- p. 63, paragraph one: *perhaps not as effective because of its contrived nature* should be *perhaps not as effective as everyday conversation because of its contrived nature.*
- p. 64, paragraph two: *He tried to encompass more richness into models* should be *He tried to enrich models*
- p. 64, paragraph two: *experts* should be *experts'*
- p. 84, paragraph one: *they are be related* should be *are related*
- p. 101, paragraph three: *E*, which should be *E*, which
- p. 114, paragraph one: *Example 6* should be *Example 7* and *membership for* should be *membership values for*
- p. 114, equation (3.33):  $\mu_{INT(C_1)}$  should be  $\mu_{INT(\tilde{C}_1)}$  and  $(e_4, 0.1)$  should be  $(e_4, 1.0)$
- p. 115, equation (3.34):  $\alpha_n c_{i,\alpha_i}$  should be  $\alpha_q c_{i,\alpha_q}$
- p. 116, paragraph four: *again the fuzzy* should be *again a fuzzy* and  $\tilde{C}_1$  should be  $\tilde{C}_1$
- p. 117, paragraph two: *research inclusion* should be *research, inclusion*
- p. 120, paragraph two:  $\alpha_7$  and  $\alpha_8$  should be  $\alpha_8$  and  $\alpha_9$
- p. 128, paragraph three: *himself [sic]* should be *himself*
- p. 138, equation (4.4):  $<$  should be  $< \alpha_i$  and *when  $i = 1$*  should be *when  $l = 1$*
- p. 141, paragraph two: *course* should be *coarse*
- p. 142, equation (4.9):  $2K_{\alpha_1}^c$  and  $2K_{\alpha_2}^c$  should be  $2K_{\alpha_2}^c$  and  $2K_{\alpha_3}^c$
- p. 144, paragraph one:  $A_c [H_k^c, H_k^c]$  should be  $A_c [H_k^c, H_k^c]$
- p. 145, paragraph two:  $\tilde{G}^t$  should be  $G^t$
- p. 145, paragraph three:  $\tilde{G}^t$  should be  $G^t$
- p. 167, paragraph two: *Huston*, *Mchale* should be *Huston, Mchale*
- p. 167, paragraph four: *If married* should be *If married,*
- p. 169, paragraph one: *events following* should be *events immediately following*
- p. 170, paragraph one: *glitches* should be *problems* and *ironed out* should be *rectified*
- p. 170, paragraph four: *chapter* should be *Chapter*
- p. 174, paragraph one: *High scores were interpreted as indicative of a progressive attitude towards women* should be *High scores are interpreted as indicative of a modern attitude towards the roles of women*
- p. 176, paragraph four: *However Abidin* should be *However, Abidin* and *that that* should be *that*
- p. 179, paragraph two: *so as to protect the identity of participants whilst at the same time maintaining the integrity of each case reported.* should be *so as to protect the identity of participants.*
- p. 182, paragraph five: *mailed to,* should be *mailed to*
- p. 190, paragraph two: *a section,* should be *a section*
- p. 190, paragraph three: *amenable multidimensional* should be *amenable to multidimensional*
- p. 191, paragraph one: *to practice the process of writing* should be *to practice writing*
- p. 191, paragraph three: *the method* should be *the method,*
- p. 192, paragraph one: *experiences since* should be *experiences for the researcher since*
- p. 193, paragraph two: *an impression* should be *an opinion*
- p. 199, paragraph three: *This accords with the impression of the researcher* should be *This accords with the opinion of the researcher*
- p. 199, paragraph three: *common sleep* should be *common, sleep*
- p. 201, paragraph one: *warrior* should be *physically strong one*
- p. 207, paragraph two: *hard sciences* should be *sciences*
- p. 267, paragraph three: *Gareth's* should be *David's*
- p. 269, paragraph three: *where Gareth or Gareth's appears read David or David's*
- p. 309, paragraph three: *Peter,* should be *Peter*
- p. 319, paragraph three: *(AWS) Spence* should be *(AWS) Spence*
- p. 371, paragraph one: *epistemological.* should be *epistemological character.*
- p. 372, paragraph one: *skin' research* should be *skin', research*
- p. 372, paragraph two: *his theory.* should be *Kelly's theory. Kelly's theory* should be *his theory*
- p. 373, paragraph two: *one the other* should be *one or the other*
- p. 378, paragraph three: *current exhibit* should be *current work exhibit*

**THE REPRESENTATION OF PERSONAL CONSTRUCTS AS FUZZY SUBSETS  
DEVELOPING A MODEL AND TESTING ITS EFFICACY**

Alastair Andrew Anderson  
BEc, MBA (Mon) Grad Dip Ops Rsch (RMIT)

Thesis submitted in fulfilment of the requirements  
for the degree of Doctor of Philosophy

Faculty of Business and Economics  
Department of Management  
Monash University  
March 1999

## SUMMARY OF CONTENTS FOR VOLUME 2

Appendix I	— Preliminary Field Interviews . . . . .	1
Appendix II	— Sample FUZZYGRID Output . . . . .	17
Appendix III	— The Pilot Study – Additional Cases , . . . .	39
Appendix IV	— Statistical Analysis of the Questionnaire Data . . . . .	64
Appendix V	— The Main Study – Additional Cases . . . . .	134
Appendix VI	— Questionnaires and Forms . . . . .	203
Appendix VII	— Publications . . . . .	252
Bibliography	. . . . .	276



## VOLUME 1 — CONTENTS

<b>1 Research Outline</b>	<b>1</b>
Introduction	1
Work and Nonwork	1
The Research Question	10
Justifications for the Research	10
Methodology	16
Outline of the Thesis	21
Definitions	27
Limitations and Assumptions	30
Presentation	31
Conclusion	31
 <b>PART ONE — THE THEORETICAL AND METHODOLOGICAL FRAMEWORK</b>	 <b>32</b>
<b>2 Critique of Personal Construct Psychology</b>	<b>33</b>
Introduction	33
An Overview of Personal Construct Psychology	34
The Insular Nature of Kelly's Work	39
Subjective Versus Objective Approaches to Research	53
Evaluating Methods of Construct Elicitation	62
Cognitive Structure	68
Conclusion	82

<b>3 Representing Personal Constructs as Fuzzy Subsets</b>	<b>84</b>
Introduction	84
Personal Constructs as Classical Sets	86
Personal Constructs as Fuzzy Subsets	99
Decomposing Fuzzy Subsets	115
Elements as Fuzzy Subsets	121
Conclusion	126
 <b>4 The Fuzzy PCP Model</b>	 <b>128</b>
Introduction	128
The Fuzzy-PCP Model	131
The Mathematics of the Fuzzy-PCP Model	136
An Overview of FUZZYGRID	157
Conclusion	159
 <b>PART TWO — THE EMPIRICAL STUDIES</b>	 <b>161</b>
 <b>5 The Research Design</b>	 <b>162</b>
Introduction	162
The Research Design	163
Ethics	177
Recruitment of Participants	184
Conclusion	188
 <b>6 The Pilot Study</b>	 <b>190</b>
Introduction	190
Case 1: Stephen and Emma	192
Case 2: William and Anna	207
Developing the Repertory Grids	218
Analyzing Grids with the Fuzzy-PCP Model	228
Case 3: David and Victoria	229
Multidimensional for Further Resolution of Data	237
The Analysis of David's Grid	243
Conclusion	248

<b>7 The Main Study . . . . .</b>	<b>250</b>
Introduction . . . . .	292
Summary of Aggregate Results . . . . .	251
Case 4: Peter and Maria . . . . .	256
Measuring Change in the Form of a Cognitive Structure . . . . .	270
Using Directional Statistics to Compare Subject Vectors . . . . .	290
Case 5: Len and Anne . . . . .	329
Conclusion . . . . .	367
 <b>PART THREE – RESUME . . . . .</b>	 <b>369</b>
 <b>8 Conclusions and Implications. . . . .</b>	 <b>370</b>
Introduction . . . . .	370
Reprise of Part One . . . . .	371
Reprise of Part Two . . . . .	377
Conclusions about Key Issues . . . . .	378
The Case Studies . . . . .	384
The Contributions of the Research . . . . .	395
Implications for Policy and Practice . . . . .	397
Implications for Future Research . . . . .	399

## FIGURES

6.1	- Construct Consensus by Alpha Value . . . . .	235
6.2	- Construct Map for David's Work-Nonwork Activities Grid . . . . .	245
6.3	- Element Map for David's Work-Nonwork Activities Grid . . . . .	247
7.1	- Changes in Stress and R-Square with Dimensionality . . . . .	265
7.2	- Construct Map for Peter's Work-Nonwork Activities Grid . . . . .	266
7.3	- Element Map for Peter's Work-Nonwork Activities Grid . . . . .	268
7.4	- ALSCAL Syntax for Deriving a Reference Configuration . . . . .	278
7.5	- Construct Maps for First Occasion Work-Nonwork Activities Grid . . . . .	280
7.6	- Syntax for Deriving a Configuration for second Occasion Data . . . . .	281
7.7	- FPWMDS Weight Space for Peter's Work-Nonwork Activities Grid . . . . .	284
7.8	- Construct Maps for Work-Nonwork Activities Grid . . . . .	286
7.9	- WMDS Weight Space for Peter's Work-Nonwork Grids . . . . .	288
7.10	- Construct Map for Peter's Work-Nonwork Grid under WMDS . . . . .	289
7.11	- Normalised Weights and Angular Variation for the Constructs . . . . .	293
7.12	- Element Maps for Peter's Work-Nonwork Activities Grid . . . . .	296
7.13	- Construct Maps for Peter's Work-People Grid . . . . .	301
7.14	- Construct Maps for Peter's Revised Work-People Grid . . . . .	304
7.15	- Element Maps for Peter's Work-People Grid . . . . .	306
7.16	- Construct Maps for Peter's Nonwork-People Grid . . . . .	312
7.17	- Element Maps For Peter's Nonwork-People Grid . . . . .	315
7.18	- Construct Maps for Len's Work-Nonwork Activities Grid . . . . .	336
7.19	- Element Map for Len's Work-Nonwork Activities Grid . . . . .	339
7.20	- Construct Maps for Len's Work-People Grid . . . . .	346
7.21	- Element Maps for Len's Work-People Grid . . . . .	349
7.22	- Construct Maps for Len's Nonwork-People Grid . . . . .	354
7.23	- Element Maps for Len's Nonwork-People Grid . . . . .	356

## TABLES

3.1	- Partial Grid for Four Politicians . . . . .	90
3.2	- Hypothetical Grid for Four Politicians . . . . .	93
3.3	- Agreement Matrix for Hypothetical Grid . . . . .	94
3.4	- Agreement Matrix using Bieri's Criteria . . . . .	95
3.5	- Agreement Matrix using Bannister's Criteria . . . . .	96
3.6	- Construct Types and Rating Schemes . . . . .	102
3.7	- The Decomposition of Fuzzy Construct Subsets . . . . .	118
3.8	- The Decomposition of Fuzzy Element Subsets . . . . .	124
4.1	- Fuzzy Grid for Politicians . . . . .	144
4.2	- Transposed Fuzzy Grid . . . . .	145
4.3	- Similarity Matrix for Construct Pairs . . . . .	152
4.4	- Similarity Matrix for Element Pairs . . . . .	157
5.1	- Median Breakpoints for Masculinity and Femininity Scale . . . . .	173
5.3	- Benchmarks for Parenting Stress Index . . . . .	176
6.1	- Biographical Data for Stephen and Emma . . . . .	192
6.2	- Stephen's Descriptions of his Ideal Self . . . . .	194
6.3	- Work Related Data for Stephen . . . . .	195
6.4	- Stephen's Satisfaction with Time Available for Nonwork Activities . . . . .	197
6.5	- Stephen's Contributions to Household Work . . . . .	197
6.6	- Stephen's Descriptions of Self as a Father . . . . .	200
6.7	- Stephen's Contributions to Babycare . . . . .	202
6.8	- Relationship and Role Salience Data for Stephen . . . . .	203
6.9	- Stephen's Marital Satisfaction Levels and Spouse Relations . . . . .	204
6.10	- Parenting Stress Measures for Stephen . . . . .	205
6.11	- Stress Ratings Reported by Stephen . . . . .	205
6.12	- Biographical Data for William and Anna . . . . .	207
6.13	- William's Descriptions of his Ideal Self . . . . .	208
6.14	- Work Related Data for William . . . . .	209
6.15	- William's Satisfaction with Time Available for Nonwork Activities . . . . .	210
6.16	- William's Contributions to Household Work . . . . .	211
6.17	- William's Descriptions of Self as a Father . . . . .	212
6.18	- William's Contributions to Babycare . . . . .	213
6.19	- Relationship Characterisation and Role Salience Data for William . . . . .	214

6.20	– Williams Marital Satisfaction Levels and Spouse Relations . . . . .	216
6.21	– Parenting Stress Measures for William . . . . .	216
6.22	– Stress Ratings Reported by William . . . . .	217
6.23	– Element Types and Configuration for Work-Nonwork Activities . . . . .	222
6.24	– Element Types and Configuration for Work-People Grid . . . . .	222
6.25	– Element Types and Configuration for Nonwork-People Grid . . . . .	223
6.26	– Biographical Data for David and Victoria . . . . .	229
6.27	– David's Work-Nonwork Activities Grid . . . . .	231
6.28	– Transposed Work-Nonwork Activities Grid for David . . . . .	232
6.29	– David's Work-Nonwork Constructs as Level-Sets ( $\alpha_{0.20}$ ). . . . .	232
6.30	– David's Work-Nonwork Constructs as Level-Sets ( $\alpha_{0.90}$ ). . . . .	233
6.31	– Construct Consensus by Alpha Value . . . . .	234
6.32	– Construct Consensus Matrices at Different Alpha Values . . . . .	236
6.33	– The Similarity Matrix for David's Work-Nonwork Constructs . . . . .	237
6.34	– Analysis of Constructs in David's Work-Nonwork Activities Grid . . . . .	244
6.35	– Analysis of Elements in David's Work-Nonwork Activities Grid . . . . .	246
7.1	– Biographical Data for Peter and Maria . . . . .	256
7.2	– Peter's Descriptions of his Ideal Self . . . . .	257
7.3	– Peter's Work-Nonwork Activities Grid . . . . .	259
7.4	– Consensus Coefficients for Peter's Work-Nonwork Activities Grid . . . . .	261
7.5	– CMDS Model Statistics for Peter's Work-Nonwork Grid . . . . .	265
7.6	– CMDS and WMDS Results for Peter's First Occasion Grid . . . . .	279
7.7	– FPWMDS – Model Statistics for Peter's Work-Nonwork Grids . . . . .	283
7.8	– Differences Between Weights for FPWMDS Configuration . . . . .	283
7.9	– Model Statistics – Standard WMDS of Peter's Work-Nonwork Grids. . . . .	287
7.10	– Weight Vectors and Lengths for the Constructs in Peter's Grids . . . . .	292
7.11	– Vector Directions, Lengths and Angular Variation for the Constructs . . . . .	293
7.12	– Weight Vectors and Lengths for the Elements In Peter's Grids . . . . .	294
7.13	– Vector Directions and Angular Variation for the Elements . . . . .	295
7.14	– Peter's Work-People Grid . . . . .	299
7.15	– Golden Section and FUZZYGRID Results for Peter's Work-People Grid . . . . .	300
7.16	– FPWMDS Model Statistics for Peter's Work-People Grid . . . . .	300
7.17	– Measures Based on Negative Poles for Peter's Work-People Grid . . . . .	303
7.18	– FPWMDS Results for the Constructs Based on Negative Poles . . . . .	303
7.19	– FPWMDS Results for the Elements Based on Negative Poles . . . . .	305
7.20	– Peter's Nonwork-People Grid . . . . .	309

7.21	– Golden Section and FUZZYGRID Results for Peter's Nonwork-People Grid . . .	310
7.22	– FPWMDS Results for Peter's Nonwork-People Grid . . . . .	311
7.23	– Dissimilarity of Constructs for Nonwork-People (First Occasion) . . . . .	313
7.24	– Dissimilarity of Constructs for Nonwork-People (Second Occasion) . . . . .	314
7.25	– Work Related Data for Peter . . . . .	317
7.26	– Peter's Contributions to Household Work . . . . .	319
7.27	– Peter's Descriptions of Self as a Father . . . . .	322
7.28	– Peter's Contributions to Babycare . . . . .	323
7.29	– Relationship and Role Salience Data for Peter . . . . .	324
7.30	– Peter's Marital Satisfaction Levels and Spouse Relations . . . . .	325
7.31	– Parenting Stress Measures for Peter . . . . .	326
7.32	– Stress Ratings Reported by Peter . . . . .	326
7.33	– Biographical Data for Len and Anne . . . . .	330
7.34	– Len's Descriptions of his Ideal Self . . . . .	330
7.35	– Len's Work-Nonwork Activities Grid . . . . .	332
7.36	– FUZZYGRID and CMDs Results for Len's Work-Nonwork Activities Grids . . .	334
7.37	– FPWMDS Model Statistics for Len's Work-Nonwork Activities Grid . . . . .	335
7.38	– Len's Work-People Grid . . . . .	342
7.39	– FUZZYGRID AND CMDs Results for Len's Work-People Grid . . . . .	343
7.40	– FPWMDS Model Statistics for Len's Work-People Grids . . . . .	344
7.41	– Len's Nonwork-People Grid . . . . .	351
7.42	– FUZZYGRID and CMDs Results for Len's Nonwork-People Grid . . . . .	352
7.43	– FPWMDS Model Statistics for Len's Nonwork-People Grid . . . . .	353
7.44	– Work Related Data for Len . . . . .	358
7.45	– Len's Contributions to Household Work . . . . .	359
7.46	– Len's Descriptions of Self as a Father . . . . .	361
7.47	– Len's Contributions to Babycare . . . . .	362
7.48	– Relationship and Role Salience Data for Len . . . . .	363
7.49	– Len's Marital Satisfaction Levels and Spouse Relations . . . . .	364
7.50	– Parenting Stress Measures for Len. . . . .	365
7.51	– Stress Ratings Reported by Len. . . . .	365
8.1	– The Contributions of the Research to the Theory and Methods of PCP. . . . .	396

## SUMMARY

This thesis reports on the constructions of work and nonwork by a group of professional men during the transition to fatherhood. Whilst this is the empirical focus of the work the thesis is presented as three parts. This structure makes plain the methodological development that was undertaken in order to give full expression to the philosophy underpinning the research. Moreover it shows how theory and method grounded in a philosophical position were operationalised and tested in the field.

The philosophy underlying the research is that of *constructive alternativism* promulgated by George Kelly (1955). That philosophy, which was fundamentally opposed to the prevailing *behaviourist paradigm*, was that individuals are not passive agents but actively involved in construing the world around them and behaving on the basis of those constructions. Thus arises Kelly's notion of the *personal construct* which is a basis for patterning experience. Personal constructs are *bipolar* dimensions of similarity and contrast which in the aggregate make up cognitive structures and substructures. Knowledge about the form and content of these structures is useful in helping to understand others. If one can understand the frame of reference that another uses in the different contexts in which he or she is involved then some basis for inferring their behaviour in those contexts is achieved.

Kelly's work was appealing because he promoted a philosophy that was accepted by the researcher, developed a theoretical position founded on that philosophy and also a methodology that was intimately connected with that theoretical position. The



methodology was the *Repertory Grid* and it was ultimately used as the platform for the conduct of the field research. However, a problem presented itself in that Kelly's theory required retrospective integration with similar work so that it was defensible. An opportunity was also presented by what seemed to be an omission by Kelly in so far as he did not adequately address the important distinction between *bipolarity* and *dichotomy*. The first half of this thesis provides a critique of Kelly's theory and also presents a new basis for representing personal constructs as *fuzzy construct subsets*. This alternative specification is not at odds with the *dichotomy corollary*. Rather it embraces it in a specification of constructs as sets in which elements have *graded membership*. Thus, full membership (membership value of 1) and non-membership (membership value of 0), which represent the dichotomy corollary are represented, as are intermediate positions.

This methodological innovation which has been represented in the *FUZZY-PCP* model and the software **FUZZYGRID**, was tested extensively by using it to analyse constructions about work and nonwork from a sample of first time fathers. Substantive issues related to the work and family debate were investigated. A primary conclusion of the research is that the transition to parenthood appears to resolve roles into a traditional pattern at least in the short term. However, the research suggests that men and women behave in traditional ways, particularly in relation to the division of household labour, irrespective of their parental status. Therefore doubt exists about whether deeply held sex-role attitudes of women and men are changing. Moreover, in terms of shifts it would appear that men need to redress the significant imbalance in the division of household labour since this inhibits the capacity of women to pursue career goals in the same way that men are free to do.

The research presented here offers a new methodology for researching attitudes in a range of areas and is the basis for further large scale research to test the propositions that have been made.

## DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university and to the best of my knowledge and beliefs, this thesis contains no material previously published or written by another person except where due reference is made in the text of the thesis.

.....

## ACKNOWLEDGEMENTS

This thesis is dedicated to the memory of my father Michael Anderson. I owe him gratitude for always encouraging me to articulate my ideas.

I would like to thank the participants who volunteered their time and gave generously of themselves at a very important stage in their lives. The thesis could not have been completed without the long-suffering support and encouragement of my wife Julianne for which I will always be grateful. I also owe many thanks to Associate Professor Mike Knowles who provided supervision, critical feedback, and encouragement throughout the period of the research. I wish to also convey my thanks to Dr Roger Wallace of Deakin Univerisity who provided valuable critiques of the early work and to Mr George Nowara for providing the programming support necessary to create the FUZZYGRID software. My gratitude is also extended to Ms Annegret Goold who provided additional programming assistance.

Thanks again to Julianne who spent many hours reading drafts of the thesis and to Helen Hobbs, Mona Black, Nicky Meintjes, Jane Acramann, Debbie Lyttle and Sue Harris each of whom proofread parts of the thesis.

## **CHAPTER 1**

### **RESEARCH OUTLINE**

#### **Introduction**

This chapter describes the purposes of this research which are twofold. The first aim, which lies within the field of *Personal Construct Psychology* (PCP), is to represent *personal constructs* (Kelly, 1955), as *fuzzy subsets* (Kaufmann 1975). The second aim is to apply this methodology to a sample of professional men, in order to portray how they construe work and nonwork during the transition to fatherhood. The purpose is to demonstrate the power of this approach in gaining insights into both the form and content of their cognitive structures. The thesis, which is structured as three parts, is presented in Volume 1. Reflecting the first aim, part one elucidates the theoretical basis of the research and the justifications for the methodological direction. Reflecting the second aim, part two shows how the methodology was implemented in the field. Part three integrates the thesis into a cohesive whole. Volume 2 contains appendices, which are complementary to the thesis. In particular appendix IV contains an in-depth analysis of the questionnaire data collected during the research.

#### **Work and Nonwork**

The research is undertaken within the wider context of work and nonwork in which the work-family systems are situated. Alluding to the importance of work and family Engels (1884) wrote narrowly of '*production*' and '*reproduction*' as the twin bases of human

existence' VAN DEN Berghe 1984, p. 31). Similarly Freud (1985) spoke of human needs in terms *work* and *love*, and it has been argued that work-family systems represent two of the most important aspects of adult life (Zedeck, Maslach, Mosier & Skitka 1989; Frone, Russell & Cooper 1992; Zedeck 1992). The workplace is a domain where the primary objective is to achieve a particular productive goal. In contrast the family exists to provide physical and emotional care and nurturance to its members (Googins 1991, p. 7). This is not to deny the existence of personal relationships at work. However it may be argued that such relationships have a different character to those that exist within the nonwork domain. Casey (1995) wrote that the team family culture of the contemporary workplace is a company-provided 'simulated sociality'. White-collar workers 'suspect that the workplace is not a family, but are confused and frustrated by the rhetoric that claims it to be so and their wish to believe in it'. In contrast 'blue-collar workers have retained a stronger class-based remnant of an organic social life at work. Many of them continue to socialize with each other and play company organized team sport' (Casey 1995, pp. 150-4).

Thus the essence of the workplace is to demand and reward instrumental behaviours. In contrast the family is an expressive domain. This is not to imply that people's behaviour in the nonwork domain is always congruent with requirements. One form of work-family conflict is 'behavior-based in which the behaviors that are functional in one role are dysfunctional in another role' (Greenhaus 1989, p. 25). For example 'logical, analytical, detached and judgmental behavior' may be functional at work but inappropriate and unappreciated at home (Greenhaus 1989, p. 27). Similarly one who is 'psychologically present' (Kahn 1990, p. 692) at work but physically present at home

may experience conflict in terms of attempting to fulfill the demands of nonwork roles (Frone, Russell & Cooper 1992, p. 67).

### **Separate Worlds and the Polarisation of Roles**

In historical terms it may be seen that industrialisation resulted in a separation of work and nonwork. Work was differentiated in time and space, and socially differentiated from other role systems of kinship, religion, politics and education (Kabanoff 1980, p. 60). In concert with this was the emergence of polarised roles that reflected and reinforced the notion that the female role was 'predominantly in household management and childcare'. The ideology of femininity justified women's exclusion from the workplace and their 'subservience to and dependency upon men'. Thus emerged the 'true cult of womanhood' which portrayed women as ill suited to the hard, competitive world of work but well suited to homemaking through the synergy of biology and a natural ability for child rearing. The home was the most suitable arena in which to express the female virtues of softness, passivity and altruism and less demanding of an inferior intellect (Fowlkes 1987, p. 4).

By the nineteenth century the economic system reflected the 'separate spheres' ideology for the two sexes. Breadwinning was seen not only as the father's main activity but their primary function' (Burgess 1997, p. 16). It was underwritten by women's economic subordination that supplied men with an exclusive status on which masculine identity had traditionally relied. Moreover, the role of the sole provider gained 'widespread acceptance as the definition of good fathering'. However, the confluence of these developments was that fathers lost their grip on family life, fatherhood was

steadily de-skilled and women and others gradually took over the day-to-day functions in the home (Burgess 1997, p. 17).

In summary industrialisation represented the very end of a long and complex process that led to the separation of work and family (Pleck 1983, p. 315). Deeply held *gender* role ideologies became embedded within the social fabric. These ideologies sanctioned and rewarded behaviours, which were congruent with them. The term *gender* not *sex* is used here to indicate that gender refers not only to biological sex, but also to psychological, social and cultural features and characteristics strongly associated with the biological categories of male and female' (Gilbert 1993, p. 11). It alerts one to be cognisant of 'psychological processes, cultural values and male power' (Arendell 1997, p. 141) which shape the commitments of men and women to work and nonwork roles.

Maintaining the 'myth of separate worlds' (Kanter 1977) industrial and organisational researchers focussed their attention on the work domain, ignoring the family. Family researchers addressed family interactions without explicitly recognising the interface between work and family (Orthner & Pittman 1986, p. 574; Kline & Cowan 1989, p. 62; Zedeck & Mosier 1990, p. 240; Fallon & Sycamore 1997, p. 3). Whilst the research in these two fields reflected the view that work and family environments are independent of one another, only partial support has been found for the segmentation model which underlies it (Zedeck & Mosier 1990, p. 241; Loscocco & Roschelle 1991, p. 203). On the other hand, whilst Zedeck (1992, p. 3) reported the emergence of the view that work and family systems are not independent but 'permeable' (Pleck 1977), the spillover and compensation models have not been completely supported by the research (Zedeck 1992, p. 9). However, it is now widely accepted that work and family systems should not



be studied in isolation. There is moreover, a 'reciprocal interdependence' not a 'unidirectional' relationship between work and family. Work concerns influence family but family concerns also influence work (Brinkerhoff 1984, p. 6).

### **The Multiple Roles of Women**

In concert with the acceptance of the permeable boundaries between work and family, social and demographic changes have affected and have been effected by women. The 'feminine mystique' and the highly elaborated role of the suburban housewife who is concerned only about her husband, her children and her home (Fowlkes 1987, p. 5) represent only traditional views of the role of women. Apart from economic pressures, which have necessitated that families have two wage earners, women are responding to a social psychological need to develop their identity (Duxbury & Higgins 1991, p. 60; Gilbert 1993, p. 6; Arendell 1997, p. 145). Many more women now choose to pursue tertiary education, to defer marriage and childbirth and then combine career, marriage and family. However, from the 'beneficial effects' perspective, which is that multiple roles enhance psychological wellbeing, it has been suggested that when women combine career, marriage and family roles they are handicapped by a variety of problems. Two of these are the continued responsibility for unpaid household work and childcare (Thoits 1987, p. 13). In an Australian study Bittman (1995) showed that women still carry the 'double load' of meeting the demands of paid and family work. The implication is that men have not altered their behaviour to accommodate the additional demands of the *dual-income* family. The term "dual-income" is used here in recognition of the fact that there are families in which the dual-income status primarily reflects economic necessity whereas in others both partners are *careerists* such that income earning may not be the dominant driver. The *asymmetry* of the traditional sex-typed

division of labor (Fowlkes 1987, p. 8) in dual-income families is evidenced by the differences in the pattern of participation in full time work by men and women. Women in couple families with children under five are much more likely to use part-time work as a way of combining work and family responsibilities (Wolcott 1995, p. 1).

### **Rediscovering Fatherhood**

Lamb (1981, pp. 3-6) argued that after being lost to the effects of industrialisation and the acceptance of a biological imperative which devalued the paternal role, fatherhood had been through a period of 'rediscovery' that was first evidenced in the late 1960s. However, in Australia, Russell (1983a, p. 2) observed that it was difficult 'to find examples in the media and popular culture of men caring for children and that there were few models of highly participant fathers and even fewer examples of this model of fathers being given any status'. In contrast Pease and Wilson (1995, p. 61) argued that because of social changes there was 'a context in which some men can potentially explore and develop their nurturing capacities'. These changes included the active involvement of men with pregnancy and birth, increased opportunities for men to engage in nurturing occupational roles, more debate about gender roles, increased tolerance of non-traditional family forms and a plurality of masculine identities and models of fatherhood. Thus, despite the slow pace of change in men's domestic behaviour, it is now acceptable to suggest that fathers can behave like mothers and maintain their gender identity (Burgess 1997, p. 24). For example,

The initial ILO document, Recommendation 123, was titled, "Concerning the Employment of Women with family Responsibilities". ... [However] ILO 156 replaced the term women workers with *men and women workers*, emphasizing that the issues addressed ...do not concern women alone they; they concern all workers (Wolcott 1990, p. 292).

However a sceptical view put forward by Wajcman (1996) was that:

The fact is that these family-friendly policies have been defined as relevant only to women employees, as if only women are parents and as if men have no concerns other than work. So just as family revolves around assumptions about gender role, so too does the workplace (Wajcman 1996, p. 57).

Despite this there are indications that the dichotomy between the cultural norms of fatherhood and motherhood is no longer viable. It appears that men are expected to maintain or share the provider role and at the same time become increasingly involved in a more androgynous family role so that:

The emergence of a new perspective about fatherhood has led some men to face a number of tensions in their own lives, since contradictory social forces and pressures are operating (Pease & Wilson 1995, p. 62).

Button (1993) wrote that:

Once, being a "good Provider" was enough. But today, the seams of male certainty have been unstitched, and much of this has been women's work. Feminism is not some passing fashion, nor, except in the nuances of academic theory, a plaything of the educated middle class (Button 1993, p. 36).

Knijin (1995, p. 1) said that 'fatherhood is in a state of crisis...The foundations of fatherhood — the father's status and position and male gender identity — are no longer indisputable'. However, LaRossa (1991) argued that:

The institution of fatherhood includes two related but distinct elements. There is the *culture of fatherhood* (specifically the shared norms, values, and beliefs surrounding men's parenting, and there is the *conduct of fatherhood* (what fathers do, their paternal behaviors). This distinction between culture and conduct is worth noting because although it is often assumed that the culture and conduct of a society are in sync, the fact is that many times the two are not synchronized at all. ... The culture of fatherhood has changed more rapidly than the conduct (LaRossa 1991, p. 307).

Similarly Knijn (1995, p. 2) wrote that the 'symbolic representation' of fatherhood has changed such that fathers are now being presented as 'committed and concerned about their children'. However, a more cynical view is that 'fathers do not really care for their children but that females friends and relatives are charmed' by this new incarnation of fatherhood (Knijn, 1995, p. 3).

## **The Transition to Parenthood**

For a couple, the transition to parenthood is a major marker in the individual and the family life cycle, which has long term consequences (Kalmus, Davidson & Cushman 1992, p. 516; Crohan 1996, p. 933). LeMasters (1957) initiated the research on the transition to parenthood (Belsky & Rovine 1990, p. 5). Drawing on the crisis research in the field of family sociology he conceptualised the family as a small social system. The addition of a new member could force a reorganisation of the system as drastic (or nearly so) as does the removal of a member. Thus the birth of the first child could be construed as a crisis event, after which roles have to be reassigned, status positions shifted, values reoriented, and needs met through new channels (LeMasters 1957, p. 352). Reporting on the experience of the fathers in his study LeMasters (1957) wrote that they felt:

Economic pressure resulting from the wife's retirement plus additional expenditures necessary for the child; interference with social life; worry about a second pregnancy in the near future; and general disenchantment with the parental role (LeMasters 1957, p. 354).

The traditional view of husband as provider and wife as caregiver can be distilled from this extract. The subliminal message is that the birth of the first child polarised roles and constrained choices. Fathers would resign themselves to breadwinning indefinitely whilst women would retreat from the world of work to fulfil the caregiver role.

Commenting on the mother's experience of the transition LeMasters (1957, p. 354) wrote:

The mothers with professional training and extensive professional work experience suffered "extensive" or severe crisis in every case. In analyzing these cases, it was apparent that these women were really involved in two major adjustments simultaneously: (1) they were giving up an occupation which had deep significance for them; and (2) they were assuming the role of mother for the first time.

Today the notion of women 'retiring' following the birth of the first child has far less acceptance. Furthermore, many women would take umbrage to the implication that motherhood is in some way a kind of retirement activity. However, there is evidence that a significant proportion of women withdraw from the workforce for an extended period while their children are below school age. In June 1996 51% of mothers whose youngest child was under five years of age were not in the labour force (ABS 1997, p. 31). In contrast Edgar (1995, p. 8) reported that three-quarters of working women returned to paid work within eighteen months after the birth of a child, although the preference was for part-time work. Figures reported for June 1996 showed that among working mothers with children under five years, 66% worked part-time. Among women whose youngest child was aged 10-14 years 72%, were working and only 48% worked part-time (ABS 1997, p. 31). Thus it appears that the age of the youngest child is one factor affecting women's employment preferences. A preference for part-time work appears to be most likely when the youngest child is under school age. In contrast the labour force pattern of fathers is unaffected by the age of their children (ABS 1997, p. 31).

Dyer (1963) found support for the crisis hypothesis of LeMasters (1957). However both of these studies have been discounted because they were based on retrospective accounts. More recent investigations using longitudinal and more ecologically based methodologies have led to the development of a new perspective, which is that the transition to parenthood can result in both positive and negative changes (Wallace & Gotlib 1990, p. 21). After reviewing the research in the area, Belsky and Rovine (1990, p. 6) concluded that the transition is not the same for all individuals and couples. Whilst

some may experience a crisis this represents only the extreme end of a range of adjustment patterns (Crawford & Huston 1993, p. 39).

### **The Research Question**

The research question addressed in this thesis is as follows:

***To investigate how men construe both work and nonwork as well as their behaviour in these domains during the transition to fatherhood.***

Implicit in this question is a *cognitive mediational* perspective (Russell, 1983a). The term *construe* reflects the belief that psychological meaning moderates the work and nonwork behaviour of the individual. The individual is located within the dual context of work and nonwork such that 'the place of employment and the home are environments that jointly affect the development of job satisfaction, and of individual, marital and parental well-being' (Russell 1983b, p. 20). Thus, the interdependence between the work and nonwork domains is recognised. The family system that comprises individuals, the couple relationship and parenting roles is recognised as the central focus of the nonwork domain. Family work is acknowledged as an element of that system (Kline & Cowan 1989, pp. 64-7). The term *transition* indicates that the research will be based on longitudinal rather than cross-sectional data.

### **Justifications for the Research**

#### **A New Context for Research**

A new context for research is provided by acceptance of the interdependence between work and family spheres, changes in the gender composition of the workforce and changing perceptions about sex roles (Lobel 1991, p. 507).

Changes in family composition and assumptions about family life have focused attention on the interconnections between work and family life, between the private and the public spheres of activity (Wolcott 1990, p. 290).

Many employers no longer subscribe to the segmentalist view of work and nonwork. Thus there is interest in the ways in which non-work activities may complement, compensate or compete with work activities (Knowles & Taylor 1990, p. 735). There is a growing acceptance that job performance, job satisfaction and organisational commitment can be improved by providing for the nonwork needs and responsibilities of employees.

Responsiveness to work and family issues in the face of changing workforce demographics is being increasingly recognized as excellent business practice. Such practices by exemplary Australian and overseas businesses show dramatic changes in business performance including increased productivity, improved retention rates, and reduction in absenteeism and turnover rates. Internationally this tends to be part of a broad trend by successful businesses to accommodate demographic and workforce changes, to improve organizational flexibility, and to manage human resources effectively. In doing so businesses develop and maintain a leading edge (Adie & Carmody 1991, p.vii).

Terms such as *dual-career families*, *work-family balance*, and *family friendly* have become part of the corporate vocabulary. They signify the increasing interest in the area. An increase in the frequency of articles about work and family in the popular press has also contributed to a growing awareness of issues.

Nowadays parliament debates childcare rebates and paid maternity leave. Major newspapers feature articles on workers with family responsibilities. Widespread discussion on childcare facilities, shared parenting and family leave to care for sick children is common. Enterprise bargaining agreements contain family-oriented clauses. Corporations vie for awards for providing family-supportive policies and benefits (Wolcott 1995, pp. xiii-xvii).

However this research is not undertaken under the supposition that there has been some revolution in the way men perceive and act out their roles. Whilst there have been shifts towards greater equality in the workforce, there is no evidence of any dramatic change in the balance of care giving given by mothers and fathers (Pease & Wilson 1995, p. 62).

## Augmenting the Research on Work and Family

Griswold (1993) described breadwinning as the 'unifying element in fathers' lives. Its obligations shape their sense of self, manhood, and gender'.

Supported by law, affirmed by history, sanctioned by every element in society, male breadwinning has been synonymous with maturity, respectability and masculinity (Griswold 1993, p. 2).

However men's preoccupation with breadwinning alone is being challenged (Griswold 1993, p. 4). The predominance of the *dual career/earner* family (Wajcman 1996, p. 56) requires that both men's and women's roles must change if a more fair, equitable and workable social contract is to emerge (Lamb 1993, p. 1048). However, recent Australian research has reported 'the division of housework and childcare is inequitable' (Dempsey 1997, p. 217). The current research will augment the research on work and family by reporting the experience of dual career couples as they negotiate the transition to parenthood. Particular foci of the research will be the patterns of labour force participation for the couples in the study, the household division of labour before and after the birth of the baby, and relative contributions to *babycare*.

Lamb (1975, p. 245) reported that Carmichael's (1954) *Comprehensive Manual of Child Psychology* failed to list "father" in the index. Lamb (1975) described fathers as 'the forgotten contributors to child development' (Lamb, 1975, p.245). Only recently has it been established empirically that men can be competent carers of newborns, that at least some are centrally involved in the rearing of their children, and that fathers have distinct positive effects on their children's development (Cowan & Cowan 1987, p. 45).

Relative to the research on motherhood little is known about the male experience of fatherhood (Riach 1981, p. 29; Berman & Pedersen 1987, p. 217). Research has also reflected old stereotypes, in which women were aligned with family and men with work.



Studies of men's participation in the family have often been explained through accounts given by women and there are few studies reported in which men were interviewed (Backett 1987, p. 74; Barkley 1993, p. 144).

Whilst the experience of women who occupy multiple roles is well documented, less research has addressed the issues which confront men in their multiple roles. Research on the relationship between multiple roles and mental health has been limited almost exclusively to women. Several streams of literature, both theoretical and empirical, treat the job role as central to men's psychological well being and the family role as peripheral (Barnett, Marshall & Pleck 1992, p. 358).

For these reasons the way in which men respond to and manage their roles following the birth of the first child becomes an important issue worthy of and requiring investigation.

### **Innovations in Theory and Method**

Kabanoff and O'Brien (1980) and Greenhaus (1989) advocated approaches other than causal investigations to research about work and nonwork. Brook and Brook (1989) initiated a new research direction by eliciting constructs about work and nonwork using the theory and methods of PCP. Further developments were reported in Knowles and Taylor (1991) and Brook and Brook (1993).

Kelly (1955) devised a methodology described as the Repertory Grid Test (Reptest) to give expression to his theory. The Reptest is three things in one. It is a method for

eliciting *personal constructs*, for representing them in a quantitative form, and the basis for a number of analytical methods that can be used to infer a cognitive structure.

In the current research innovations will be made to the way constructs are elicited. A substantial change will be initiated by representing personal constructs as *fuzzy subsets*. The result is the formulation of a new methodological approach that is incorporated in a mathematical model, the *Fuzzy-PCP* model. This model forms the basis for the analysis of repertory grids that is ultimately extended to incorporate the methods of Multidimensional Scaling (MDS). These methods are used to represent the form of cognitive structures as spatial maps and to provide statistics that can be used to assess the quality of those representations. A new MDS method is proposed for the purpose of assessing change or stability in the form of cognitive structures over time.

A software program named FUZZYGRID that was written to automate the analysis of repertory grid data is also presented and tested extensively with case study data.

Appendix VII contains two papers that were published during the course of the research for this thesis. The first paper *The Marriage of Personal Construct Psychology and Fuzzy Logic* (Anderson 1996) outlines the theoretical basis of the Fuzzy-PCP model and presents the model itself.

The second paper *A Model for Fuzzy Personal Construct Psychology* (Anderson 1998) presents an application of the model to a case study. This paper also shows how the FUZZYGRID output was used to develop Multidimensional Scaling Models in SPSS. Thus, these papers span the principal theoretical and methodological contributions of this thesis, which are presented in chapters 2, 3, 4 and 6. In the second paper the

proposed direction was to develop methods for examining temporal changes in perceptions. A detailed exposition of how this was achieved is presented in chapter 7.

Following Brent (1984, p. 10), the current research defines cognitive structure as comprising both *form* and *content*. Form is expressed in the relationship between the constructs. Content pertains to the semantics underlying the constructs. Whilst the poles of constructs often reflect a common vocabulary many, are idiosyncratic such that the meaning can only be understood through a dialogue with the participant. This was effected in the current research.

Thus in terms of methodology there are innovations spanning the elicitation, the representation and the analysis of repertory grids. Each of these will be achieved without compromising Kelly's theoretical position or affecting the validity of the repertory grid as a research instrument. Nosofsky (1992, p. 26) said that to understand cognitive models it is necessary to 'specify not only an underlying similarity representation, but also the cognitive processes that act upon that representation. Kelly's theory is attractive since it provides a basis for understanding both the processes underlying a cognitive structure as well as a means of representation. Construing is about *process* and the repertory grid is a vehicle for achieving mathematical and graphical *representations* cognitive structures

### **Transition in an Inclusive Context**

As indicated, the notion that the birth of a first child always initiates a crisis (LeMasters 1957) has been replaced by the concept of transition. The transition is marked by changes in mothers' and fathers' work lives and family relations, and often by overload,

conflict, strain, dysphoria and even at times inroads into parents' self esteem (Berman & Pederson 1987, p. 239). Much of the literature on the transition to parenthood places a heavy emphasis on relationship issues with peripheral references to other concerns. This research will address the transition to fatherhood within the inclusive context of the permeable domains of work and nonwork. Issues relating to the job role, the husband role, the father role, and leisure as they are affected by the birth of the first child will each be given explicit treatment.

### **A Contribution to Management Practice**

If managers can understand the variation in meanings which individuals attribute to their work and how the work-family issue can be managed more effectively. Thus it is hoped that this research will show promise by developing an approach which managers can use to explore work-family concerns with their staff either individually or in a group setting.

## **Methodology**

### **The Case Study Approach**

Individual case studies will be used as the framework within which to gather data for this research. The decision to use case studies is consistent with Yin's (1989) definition of this method.

A case study is an empirical inquiry that:

- Investigates a contemporary phenomenon within its real-life context; when
- The boundaries between the phenomenon and context are not clearly evident, and; in which
- Multiple sources of evidence are used (Yin 1989, p. 23).

The case study approach is ideally suited to research problems where the researcher has no control over behavioural events (Yin 1989, p. 17).

## Personal Construct Psychology

George Kelly was an engineer turned psychologist who became frustrated in his attempts to help clients recognise and understand their problems. Personal Construct Psychology is the outcome of his attempt to resolve that frustration. Kelly believed that each person actively construes the 'stream of events' which manifest in their lives (Kelly 1955, p. 4). He emphasised the capacity of human beings to represent the environment, not merely respond to it, thus separating his position from that of the behaviourists. Kelly was interested in the way in which constructs mediate behaviour.

Man looks at his world through transparent patterns or templates which he creates and then attempts to fit over the realities of which the world is composed. The fit is not always very good. Yet without such patterns the world appears to be such an undifferentiated homogeneity that man is unable to make any sense out of it. Even a poor fit is more helpful to him than nothing at all. Let us give the name *constructs* to these patterns that are tentatively tried on for size. ...They are what enables man ... to chart a course of behavior (Kelly 1955, p. 9).

Kelly felt that if one could elicit personal constructs from an individual it would be possible to use them in a client-therapist dialogue. He ascribed constructs with characteristics which rendered them amenable to formal analysis. He assumed that they were dichotomous abstractions of similarity and contrast (Kelly 1955, p. 61). He termed this the *Dichotomy Corollary*. Kelly also assumed that people will choose to employ one or the other pole of a construct depending on which one they think permits the possibility for extension and definition of their system (Kelly 1955, p. 64). He termed this the *Choice Corollary*.

The *Personal Construct* and the *Semantic Differential* (Osgood, Suci & Tannenbaum 1957) share common features. Each is a dimension of contrast. Some might argue that the resemblance between them stops there. In Kelly's theory constructs are personal and thus are often idiosyncratic. Semantic differentials are more general in character. However, Kelly argued that after examining individual cases it should be possible,

through a process of further abstraction, to produce constructs which underlie people in general (Kelly 1955, p. 43). This is similar to the nomothetic route taken by Osgood when he wrote about the generality of affective meaning (Osgood 1962). Furthermore, a reading of Kelly's work suggests that the assumption of dichotomy was an accommodation to the limits imposed by computer technology. Kelly said:

The Dichotomy Corollary assumes a structure of psychological processes, which lends itself to binary mathematical analysis...The practical task of reducing information to a form, which can be handled by electronic computing machines, has forced scientists to reconsider the mathematical structure of knowledge itself (Kelly 1955, pp. 61-2).

Sometime later Kelly alluded to the accommodation as the following indicates:

This problem of interpreting intermediate range data is always perplexing. Looking at the problem psychologically, this writer is inclined toward the use of dichotomous constructions with all items omitted, rather than assigned an intermediate scalar value when they cannot be clearly identified with one construct pole or the other (Kelly 1963, p. 125).

The effect of Kelly's accommodation was to force people to use extreme positions a *scale-checking style* (Osgood, Suci and Tannenbaum 1957) which Arthur (1966) found was not indicative of normal subjects but related to the severity of psychiatric illness (Arthur 1966, p. 103). Moreover, since dichotomous (categorical) rating represents the lowest level of measurement analysis flowing from it produces 'degradation in the "true" structure of relationships between concepts – both elements and constructs' (Cary 1988, p. 397). Cary (1988) also wrote that:

When measuring changes in grid structures over time, categorical data are unlikely to give an acceptable level of result because the larger error associated with the location of any concept at different time points will preclude an accurate assessment of the true movement over time (Cary 1988, p. 400).

These deficiencies of categorical rating schemes were subsequently mitigated by the extensive use of the interval level of measurement for scaling constructs. This eliminated the difference between the Personal Construct and the Semantic Differential in so far as the level of measurement was concerned.

Notwithstanding the similarities between the Semantic Differential and the Personal Construct, there are three reasons for employing Kelly's approach in the current research. Firstly his work was founded on a reasoned philosophy and his theory has considerable validity. Secondly his theory and the methodology he devised to give expression to it promote mutuality in research; the participant contributes his/her own perspective. The third reason is that Kelly's methodology is rigorous and amenable to structured methods of analysis. However, as indicated, this research will implement significant modifications to the Reptest and demonstrate a new analytical method.

In all three, grids have been designed to span the *socio-cultural* (Brinkerhoff 1984, p.14) *life space* (Lewin 1951) which comprises, the *work world*, the *family world* and the *personal world* (Sekaran 1986, p. 22). Whilst two of the grids are focused on people in the work and nonwork domains the third addresses activities in those domains. The rationale for eliciting constructs about activities is that whilst constructs about other people are very important they are not the sole indicator of personality. Shaw (1985, p. 29) described the concept of 'P (psychological) -Individuals' which represents the individual 'as a person with a number of roles' such as 'husband, a sales vice-president of his [sic] company, a backpacker, and a fisherman'. Much can be learned from investigating the way people construe the activities in which they are involved. Thus, the current research addresses people as psychological individuals in terms of the people and the activities with which they are involved in their socio-cultural life space.

### **The Questionnaires**

Two questionnaires have been devised to gather other objective and subjective data relevant to the investigation.

The first questionnaire covers a range of issues including:

- (a) biographical details;
- (b) employment history;
- (c) hours of work;
- (d) satisfaction and commitment issues related to work, organisation and relationship;
- (e) intended return to work after the birth of the baby;
- (f) household division of labour;
- (g) indicators of attitudes to women and instrumental and expressive characteristics.

The second questionnaire is administered subsequently to follow up on:

- (a) hours of work;
- (b) satisfaction and commitment issues related to work, organisation and relationship;
- (c) the salience of roles;
- (d) household division of labour;
- (e) baby care;
- (f) parental and relationship stress.

In summary the preferred research strategy is individual case studies. Repertory grid data spanning the work and nonwork domains will be supported by the data emanating from the questionnaires which also span those domains.



## Outline of the Thesis

Part one comprises three chapters which are outlined below.

### Chapter 2 — Critique of Personal Construct Psychology

Chapter 2 is organised in four sections. Section 1 traces the background to the development of Kelly's theory and discusses the criticisms that have been levelled at it. It examines the common threads between the work of Kelly and three other writers, McDougall (1931), Allport (1937), and Lewin (1951).

Section 2 discusses philosophical issues and the implications they have for methodology. It is concluded that the interpretive paradigm, which focuses on the subjective experience of the individual, fits well with Kelly's philosophy of *Constructive Alternativism* from which his theory emanated.

Section 3 reports on methods of construct elicitation and also the outcome of two preliminary interviews that were conducted as a basis for making a decision regarding the use of the repertory grid or some other construct elicitation method.

Much of the research in *Personal Construct Psychology* has been concerned with the derivation of measures of cognitive structure. In that research, cognitive structure has been defined only as form as indicated by the relationship between the constructs. A highly differentiated system is interpreted as an indicator of cognitive complexity. Low differentiation is interpreted as indicating cognitive simplicity. Citing the preoccupation with form in the research, the purpose of section 4 is to elaborate on the concept of cognitive structure as both form and content.

### Chapter 3 — Representing Constructs as Fuzzy Subsets

Chapter 3 comprises three sections. Section 1 demonstrates that Kelly's conceptualisation of constructs renders them as classical sets. The complementary rule is shown to be indicative of the Kelly's *Dichotomy Corollary*. Section one also demonstrates that the intersection rule can be used to derive a measure of cognitive complexity based on the relatedness of every distinct pair of constructs in a grid. This measure bears some resemblance to the cognitive *complexity* measure derived by Bieri (1955) and the cognitive *intensity* measure developed by Bannister (1960,1962). This is illustrated by example.

The focus of section 2 is the conceptualisation of constructs as *fuzzy construct subsets*. Central to this is the important distinction between bipolarity and dichotomy. Bipolarity indicates only that a construct has two poles that stand in contrast to each other. Dichotomy represents but one way in which one might rate an element against the poles. Consequently new procedures for construct elicitation that recognise this distinction are introduced. Examples demonstrate the mathematical operations that can be performed when constructs are represented as fuzzy construct subsets.

Section 3 presents the *Decomposition Theorem* and the related principle of *inclusion*. This opens the way for the development of relatedness measures for the constructs in a repertory grid. Section 3 also demonstrates that only a slight change in orientation is required such that the elements in a repertory grid can be represented and analysed as *fuzzy element subsets*. This renders them amenable to all of the operations described for the constructs including decomposition and inclusion.

## **Chapter 4 — The Fuzzy-PCP Model**

Chapter 4 reports the development of a model that embodies the theory of Personal Construct Psychology, the Reptest and Fuzzy Set Theory. The chapter begins by arguing for an amalgamation of the core concepts in Personal Construct Psychology and Fuzzy Set Theory. The chapter then proceeds by introducing the Fuzzy-PCP Model. The mathematical features of the model are elaborated to show how they can be used to derive a measure of construct relatedness, which is an indicator of the form of a cognitive structure. It is also shown that by introducing procedures, which exploit the *loose duality* in a repertory grid, relatedness measures for the elements can be derived. The chapter concludes by describing the software program FUZZYGRID that was written to automate the mathematical procedures contained in the Fuzzy-PCP model.

## **Chapter 5 — The Research Design**

Chapter 5, which begins part two of the thesis, describes the research design used to conduct the field research. The rationale for employing the case study method is presented, as are the selection criteria used to enlist participants. The repertory grids and the questionnaires used in the research are described. Ethical issues as they affected the conduct of the study are discussed. The chapter concludes by describing the protocols used to enlist participants in the research.

## **Chapter 6 — The Pilot Study**

Chapter 6 comprises six sections. The first section shows how the questionnaire material was written up so as to be meaningful and complementary to the repertory grid data.

Section 2 describes the process that resulted in the ultimate configuration of the repertory grids used for the field research. The rationale behind the type, number and configuration of the elements used in each of the three grids is presented. The protocols that were devised for the elicitation of the grids are described. Details are provided; of the procedures that were implemented for the coding and tracking of the data collected, and also the maintenance of its integrity and security throughout the period of the research and thereafter.

The material in section 3 shows how the Fuzzy-PCP model was applied to a repertory grid elicited from one of the participants in the research. An extended discussion demonstrates the logic of the relatedness, measure for the constructs in a repertory grid. As well as a global measure of construct relatedness, the Fuzzy-PCP model permits the production of similarity and dissimilarity matrices for the construct pairs in a repertory grid.

The fourth section shows how dissimilarity matrices produced by FUZZYGRID can be used to perform MDS such that the form of a cognitive structure underlying a grid can be estimated and represented in spatial maps. Issues connected with the use of MDS such as whether to use the metric or non-metric model are discussed, as are the criteria used in estimating the appropriate number of dimensions to employ when analysing a particular grid. This completes a discussion in which the capabilities of the Fuzzy-PCP model that are embedded in FUZZYGRID have been related to a specific case. A basis for the further resolution of grid data through MDS has been proposed.

The fifth section discusses additional aspects of grid analysis. The *Golden Section Hypothesis* and the classification of construct poles as "positive" or "negative" are discussed.

The sixth and final section in chapter 6 shows the way in which the results emanating from FUZZYGRID were used for MDS so that a composite picture of the form of a cognitive structure underlying a repertory grid could be derived. By exploiting the duality in a grid other meaningful results can be derived through an analysis of the elements using consensus measures and MDS. This is also demonstrated in section five. At the conclusion of Chapter 6 a method for the analysis of the case study data that combines material extracted from the questionnaire responses with the analysis of repertory grid data has been resolved.

## **Chapter 7 — The Main Study**

Chapter 7 comprises five sections. In section 1 a summary is presented of the main findings after the questionnaire data pertaining to the participant group was analysed.

In section 2 a case from the main study is presented. The style of presentation for the case represents the ultimate template that was derived for the analysis of material collected in the field.

Section 3 presents a discussion of the problems encountered when trying to measure change or stability in the form of a cognitive structure over time. A significant issue was that in order to maintain the idiographic thrust of the research a method was required which would allow assessments to be made on a case by case basis. Arguments and

analyses are presented to support a view that there are deficiencies in the methods of MDS that are traditionally used to measure differences in the form of cognitive structures. Flowing from that is the development and testing of a new method for measuring change or stability in the form of cognitive structures over time at the level of the individual. This is the culmination of the theoretical and methodological advances initiated in the first part of the research and developed in the field.

In section 4 analyses are presented for two other repertory grids that relate to the first case presented in the chapter.

In section 5 a contrasting case is presented which is a synthesis of the methodology developed and tested in the thesis.

## **Chapter 8 — Conclusions and Implications**

Chapter 8 in part three presents a resume of the thesis. Chapter 8 is has four sections. Section 1 is a reprise of part one. It reiterates that the philosophical position adopted by Kelly (1955) was accepted and set the ground plan for the current research. The remainder of section one reviews the methodological innovations that were implemented to address the distinction that was not made explicit by Kelly or others. That distinction was the difference between bipolarity and dichotomy. Section 1 concludes by showing that the synergies between PCP and Fuzzy-Set theory ultimately provided a basis for the expression of that difference. The outcome was the development and testing of the Fuzzy-PCP model and its ultimate incorporation in the FUZZYGRID software.

In section 2 a reprise of part two of the thesis is presented. The aim is to show how a research design was developed that would ultimately permit the substance of the Fuzzy-PCP model to be tested in the field. Conclusions about key issues, which relate to the transition to fatherhood, are presented, as are conclusions about each of the nine cases that were written up.

In section 3 the distinct contributions of the current research to the theory and methods of PCP are presented and discussed. Also discussed is the specific contribution made to multidimensional scaling methods in respect of evaluating the similarities or differences in the form of cognitive structures.

The thesis is concluded in section 4, which presents the implications of the research for policy and practice and future research directions.

### **Definitions**

(a) **Work** is the spatial, social, temporal and psychological domain of activities, responsibilities and relationships in which an individual is involved while performing a role in an organisation. The organisation is generally considered to be a work organisation if an agreement is made to supply the individual with monetary rewards in return for his or her services to the organisation. The boundary between the work and nonwork domain may be described in terms of its spatial, social, temporal and psychological characteristics.

The first part of this definition is related to the task-based definition of work by Kabanoff (1980, pp. 67–8). However, work is more than 'a set of prescribed tasks' (Kabanoff 1980, p. 67). To describe it as such is too narrow. It implies that a worker has little control over, or responsibility for, the way in which work is carried out, and that all work is rather simple in character. All employees are under the ultimate jurisdiction of the organisation for which they work, but some have more autonomy and responsibility than others do. All work has prescriptive aspects but many jobs are complex with the result that the prescriptive elements are of least significance. Furthermore to focus on a task-based definition alludes to work as only a physical space where those tasks are carried out. As the Hawthorne Experiments showed work is much more than this; it is also a social and psychological space. This definition of work resolves these concerns.

(b) **Nonwork** is the spatial, social, temporal and psychological domain of activities, responsibilities and relationships in which an individual is involved outside the work organisation. Nonwork includes maintenance activities such as shopping, housework and home maintenance, relationships (including the relationship with a partner, children, other family and friends), community activities and leisure. These activities, responsibilities and relationships vary in the extent to which they are obligatory or discretionary in nature.

The boundary between the work and nonwork domain may range from being very hard to permeable. Thus the person "married to the job" may be so absorbed in work that there is no boundary between work and nonwork. Small and Riley (1990, p. 51) used the term *psychological absorption* as an indicator of a preoccupation with work, which results in negative spillover into the nonwork domain. In contrast a person may choose



to impose a hard boundary between work and nonwork such that work is always spatially, temporally, socially and psychologically separate from nonwork.

These definitions of work and nonwork are complementary. Each is defined in terms of activities, responsibilities and relationships in a domain that can be described in terms of spatial, temporal, social and psychological characteristics. The definitions permit a bi-directional (Greenhaus & Beutell, 1985) relationship between the work and nonwork domains. Following Sekaran (1986) they encompass the notion of *psychological overflow*, which can occur from work to home and from home to work. Sekaran (1986) said:

Usually, the workplace is spatially and temporally discrete from the family home, but emotionally, psychologically, and structurally the two overlap considerably. People do not simply shed the feelings, sentiments, and emotions that they have experienced at home once they step into the organizational world in the morning, nor do they cast off the anxieties, tensions, irritations, joys and satisfactions experienced at the workplace when they return home from work in the evening (Sekaran 1986, p. 23).

Unlike Greenhaus and Beutell (1985) conflict is not presumed to be the only outcome. Following Kirchmeyer (1993), positive and negative effects are entertained.

The definitions below draw on the three theoretical perspectives on the work-nonwork interface, namely spillover, compensation and segmentation (Zedeck 1992, pp. 8-10). However, the definitions presented are linked to the way in which the work and nonwork domains have been defined above.

(c) **Spillover** describes effects that can be transmitted from the work to the nonwork domain and also in the direction of nonwork to work. These effects can be positive and/or negative. They may be expressed in spatial, temporal, physical, psychological or social terms.

- (d) **Compensation** is a response to negative outcomes in either the work or nonwork domains. People will disengage from work or nonwork roles which are unrewarding and seek compensation in the alternative domain.
- (e) **Segmentation** is a response in which the work and nonwork domains are viewed as discrete. Thus efforts are made to differentiate the domains spatially, socially, temporally, physically and psychologically.
- (f) A **personal construct** is a bipolar dimension. The relationship between the poles is one of contrast (Bannister and Mair 1968, p. 220).

### **Limitations and Assumptions**

The intention in this research is to develop a new methodology for exploring the work and nonwork constructs and experience of men during the transition to fatherhood. The research is founded on the philosophical position that the subjective experience of the individual is meaningful and helpful in explaining the transition to fatherhood. Thus subjective accounts are relied on as data.

This is not research predicated on nomothetic principles. There is no large random sample, no regression analysis. Nor is there any attempt to generalise the findings to the wider population. This does not mean that these issues were not properly evaluated in deciding on the approach to the research. Nor does it mean that common statistical tests have been avoided. They have been used and qualified where necessary.

The research outcomes may reflect volunteer bias. As will be seen in the results section the participants in the study were largely tertiary educated and highly articulate. All research is limited to some extent by the capacities of the participants. The issue has not been overlooked here and is discussed within the thesis.

The research would have been enhanced if more than one follow-up interview had been possible. However the time demand which this would have placed on the participants precluded this.

For ethical reasons it was not permissible that partners be involved in the research. This compromised triangulation.

### **Presentation**

There are many tables and figures in the thesis. Following the *Style Manual* (AGPS 1994, p. 255) the font size has been reduced to accommodate larger tables. However, where it has not been possible to display these on a single page, page breaks have been inserted. Similarly for the purposes of interpretation scaling maps are usually presented as a pair on a single page.

### **Conclusion**

This chapter has laid the foundation for the current research. The research question has been stated and the methodology described and justified. The structure and content of the thesis has been described, and the limitations of the work have been identified. Key terms and concepts have been defined.

## **PART ONE – THE THEORETICAL AND METHODOLOGICAL FRAMEWORK**

## **CHAPTER 2**

### **A CRITIQUE OF PERSONAL CONSTRUCT PSYCHOLOGY**

#### **Introduction**

There are four objectives in this chapter. Each of them is addressed in a separate section.

In section one the objective is to provide an overview of PCP. Its cognitive character is contrasted with behaviourist approaches in psychology. Criticisms that have been levelled at Kelly for his lack of attribution are discussed. The common threads between his work and a number of notable figures in psychology are presented.

In section two the focus is on philosophical issues as they affect methodology. Kelly's theory is classified in terms of its ontological and epistemological character, and its assumption about human nature.

Section three moves to practical issues. It discusses the outcomes of a process that was used to evaluate construct elicitation methods.

The objective of section four is to define cognitive structure as form and content.

## **An Overview of Personal Construct Psychology**

The publication of the *Psychology of Personal Constructs* (Kelly 1955) signalled the birth of a 'fledgling' known as Personal Construct Psychology (Neimeyer 1985, p. 17). Neimeyer's imagery is appealing since Kelly incubated the theory over a period of twenty years (Dalton & Dunnett 1990, p. 1). Darwin's notion of fitness for survival springs to mind as a metaphor for the robustness of the theory. It was presented in embryonic form in a handbook for clinical psychologists. The purpose of the handbook was to assist them in uncovering and understanding their client's perspective of themselves and others. By Kelly's own admission it was less effective than it might have been as the question of 'why kept insistently rearing its puzzling head' (Kelly 1955, p. ix). As a consequence Kelly began to formalise his thinking with a specific emphasis on the why as well as the how. Ultimately the work appeared as two volumes. Volume 1 articulated the philosophical position from which the theory is to be understood, the theory itself and the basis of the Repertory Grid Test. Volume 2 addressed 'the implications of the psychology of personal constructs in the field of clinical practice' (Kelly 1955, p. xvi).

Kelly readily acknowledged that as soon as he began to address the whys it became apparent that he had 'wandered far off the beaten paths of psychology'. He attributed this to 'years of relatively isolated clinical practice' (Kelly 1955, p. ix). This may explain why he formed the group of 'Thursday nighters'. These willing critics met weekly for a period of three years prior to the publication of the work (Neimeyer 1985, p. 19). In the United States three of them, Landfield, Maher and Bieri emerged as significant contributors to the promulgation and development of the theory. Bieri is notable for his work on cognitive complexity (Bieri 1955, 1966). Whilst he provided the greatest impetus for the subsequent research, Jones (1954) was the first to develop a measure of cognitive complexity.

The measure deriving from a factor analysis of a repertory grid was based on the explanatory power of the first factor (usually indicated by the size of the eigenvalue) and the number of factors derived (Bonarius 1965, p. 14).

### **PCP as a Modern Cognitivism**

Kelly departed from the environmental determinism of radical behaviourism and the intrapsychic determinism of classical psychoanalysis (Neimeyer 1985, p. 2). When he presented his work mechanistic theories dominated psychology (Nystedt 1983, p. 370). His psychology resonated with cognitive concepts, which had been used by theorists before him using different terms (Nystedt & Magnusson 1982, p. 41). Concepts such as *schema* (Bartlett 1932) and *cognitive map* (Tolman 1948) were clearly divorced from stimulus response conceptions of behaviour.

Cognitive psychology was the antitheses of behaviourism that relegated cognitive phenomena to the status of epiphenomena (Forgas 1981, p. 10). It emphasised 'the privacy of experience, depth in personality and mechanisms within the person that are responsible for motivation' (Butt 1996, p. 58).

From this perspective, a person's re-construing of their life involves self-searching and "getting in touch with feelings" that are the product of individual cognitions. Now there is a lot about Kelly that resonates with this general theory (Butt 1996, pp. 58-9).

Bieri (1966, p. 13) described Kelly's theory as 'purely cognitive'. He aligned Kelly with Bartlett, Piaget, Lewin and Tolman whose work assumed that 'the person's encounters with the world about him are mediated by the operation of cognitive structures, which have been variously labeled as schema, controls or styles'. Forgas (1981, p. 11) cited Kelly's theory as an example of 'a cognitive view which sought to formulate a theory of social behaviour based on cognitive principles'.

Shaw and Gaines (1992, p. 2) described PCP as taking an alternative path to behaviourism that was similar in many respects to what later became known as *cognitive science*.

Rules allow a cognitive system to be anticipatory in containing structures which from one set of distinctions made about an event will imply that others should be made leading to prediction or action (Shaw and Gaines 1992, p. 9).

The emphasis of Shaw and Gaines (1992) on the cognitive character of constructs and construct systems is warranted since they have linked Kelly's 'original intuitions' to the field of knowledge acquisition from experts. One expects the construct systems of experts to exhibit a cognitive rather than an affective character.

Eden (1989) interpreted Kelly as a cognitive theorist as evidenced by the following:

This particular body of psychological theory is a *cognitive* theory. It argues that human beings are continually striving to "make sense" of their world in order to "manage and control" that world. In this way it implicitly sees the individual as a problem finder [and] problem solver, using concepts rather than emotion to guide action (Eden 1989, p. 25).

However, Kelly (1966) rejected interpretations of his theory as cognitive. Nor would he entertain notions that his was a theory of affect or conation. So adamant was he about it that he planned another book to repudiate such claims. Kelly said:

I have been so puzzled over early labeling of pct as 'cognitive' ... that I set out to write another short book to make it clear that I wanted no part of cognitive theory (Kelly 1979, p. 216 reported in Butt 1996, p. 59).

Kelly emphasised the person as a form of motion. Thus, constructs were not merely interpretative templates. The person does not think, perceive then act, but construes in action (Butt 1996, p. 61).

As has been shown above there has been a tendency to interpret Kelly's work as a purely cognitive theory. Certainly he did not intend that this occur. Jahoda (1988) aptly described Kelly's approach as a *modern cognitivism*. He said:



All psychological phenomena rest on symbolic representations in the mind, including perceiving, learning, thinking and remembering but also desire and feeling (Jahoda 1988, p. 3).

However, more important than a debate about the character of Kelly's work is the fact that Kelly's theory 'created an opening in the positivist, realist framework' which dominated psychology at the time (Sarbin & Kitsuse 1994, p. 5). It was attractive, particularly to those who wanted to unbridle themselves from the mainstream behaviourist psychology.

When Kelly emphasized internal psychological functioning, rather than the external parameters of action, he joined a minor faction of the world's psychological scientists. Piaget (1952, 1971, a, b), whose long and prolific career totally spanned Kelly's professional career, provided a similar alternative to mechanistic behaviorism ... Piaget and Kelly were in accord with Bartlett (1932) whose pioneering contributions to the understanding of perception, memory and thinking fared poorly in the mechanistic ambience until they were incorporated into the influential works of Miller, Galanter and Pribram (1966) and Neisser (1967) (Mancuso & Adams Weber 1982, pp. 8-9).

Kelly's work was alluring particularly to those frustrated by the 'strict framework in which behaviorist scientific activity' took place and the 'interdependence' between behaviorism as a 'philosophy of science' and as a 'philosophy of mind' Zuriff (1985, p. 2).

Given the assumptions of the behaviorist philosophy of mind, the kinds of methods, theories, and explanations favored by [a] behaviorist philosophy of science appear most appropriate. Conversely, the behaviorist philosophy of science supports its philosophy of mind. A science restricted to a limited set of methods and explanations will tend to confirm a particular conception of mind (Zuriff 1985, p. 2).

However, it would be unfair to attribute self-perpetuation and isolationism only to behaviourism since even Kelly's theory is couched within the philosophy of *constructive alternativism*. In his review of *Inquiring Man* (Bannister and Fransella 1971),

Pervin (1973) said:

The major limitation of the book is that the constructs used by the authors are at time ... so tight and preemptive as to preclude incorporation of valuable insights from other theoretical points of view (Pervin 1973, p. 112 quote.) in Neimeyer 1985, p. 113).

Moreover, the connection between philosophy and method is more intimate in the case of PCP since Kelly derived the repertory grid technique to give expression to his philosophical stance.

An early convert to Kelly was Don Bannister. His recollection of his first encounter with Kelly's work and his acceptance of it has the hallmarks of a conversion experience. The following extract illustrates this:

I was looking for a framework ... that would enable me to fight and survive in the middle of what was a very unsympathetic [behaviorist] setting. And sometime during the '50's' I got to "Kelly." Thank god his name wasn't Ziminsky! But I finally got to the K's and Kelly. I remember getting the two volumes, finding them at the library and taking them back to my office ... It was a Sunday morning and I read straight through the day, until about 8 or 9 in the evening ... I went back Monday and I read faster and harder ... And that would have been my first day's encounter. That would have been about the middle of 1957, I suppose (Reported as a personal communication in Neimeyer 1985, p. 41).

Bannister was battle weary. He had already rejected behaviourism and was searching for an alternative, defensible, philosophical position when he chanced upon Kelly's work. The enthusiasm with which he embraced it evidenced his readiness for conversion. Bannister introduced PCP into Great Britain (Neimeyer, 1985, p. 40). His wider contribution is evidenced by the number of publications that he achieved which were directly related to PCP. Winter (1992) lists twenty-one articles of which Bannister was the sole author and sixteen joint publications. Three publications *The Evaluation of Personal Constructs* Bannister and Mair (1968), *Inquiring Man* (Bannister and Fransella, 1971) and *A Manual for Repertory Grid Technique* by (Fransella and Bannister, 1977) are mandatory introductory reading for anyone seeking to understand Kelly and his work.

## The Insular Nature of Kelly's Work

### Kelly's Lack of Attribution to Others

The originality of Kelly's work is acknowledged. It appeared as an alternative approach to understanding human behaviour 'at a time when American academic psychology was in the grip of behaviourism that recognized only external, not psychological reality' (Jahoda 1988, p. 2). However, it is easy to be lulled into a less than critical stance by the 'honesty innocence' and 'fun loving irreverence' of Kelly (Holland 1970, p. 111). There are common threads between Kelly's work and that of McDougall (1931), Allport (1937), and Lewin (1951). Each of them developed concepts which, although largely unacknowledged by Kelly found expression in *The Psychology of Personal Constructs* (Kelly, 1955). Synergies with the work of Bartlett (1932) can also be found. Thus, Kelly can be criticised for failing to make appropriate attributions in his work. However, his philosophy of *constructive alternativism* expressed in the metaphor of the individual as a *personal scientist* was, an 'adequate foundation for a true psychological epistemology well-grounded philosophically and capable of being developed into both 'theory and technology' (Gaines and Shaw 1981, pp. 147-8).

Kelly may have been heralded more widely if he had consulted more about his work or referred to those who went before as well as to his contemporaries. He could have mounted his challenge to behaviourism through a more critical analysis of the philosophical and theoretical differences in his approach. Moreover, he could have made it explicit that his theory was reviving concepts about human behaviour that had been obliterated by the emergence and ultimate dominance of behaviourism.

As Mancuso and Adams-Weber (1982, p. 9) noted:

In 1919 J. B. Watson systematized a position that focused on the proposition that behavioral scientists could adequately explain all human action in terms of the mechanics of "stimulus response" relationships. From this position psychologists went on to develop the principal tenets of the school of psychology known as "radical behaviorism" (Fodor 1981). In a very short time psychologists all over the earth vigorously pursuing behaviorist formulations pushed aside extant constructivist conceptions and elevated mechanism to the leading position. The implications of behaviorism have been developed most completely, both methodologically and philosophically, in the work of B.F. Skinner (1938, 1957).

Reviewing fifty years of development in personality psychology Craik, Hogan and Wolfe (1993) aligned its origins with the publication of two textbooks, *Personality: A Psychological Interpretation* by Allport (1937) and Stagner's *Psychology of Personality* published in the same year. In the review Kelly achieves a mention in several places but there is little elaboration on his work. This is typical of the pattern found in reading much of the literature in psychology. One repeatedly sees only passing references to Kelly. However, this observation should be tempered since in general personality has occupied a dissident role in the development of psychology. It has been more global in its orientation and concerned not so much with specific behaviour(s) but with the person as a whole, with function and dysfunction (Hall & Lindzey 1978, p. 4).

McAdams (1997) said:

Whereas American psychology tended toward the elementaristic, personality was holistic, taking the *whole person* as the primary unit of study. Whereas American learning theory focused on the relations between external stimuli and publicly observable responses in rats and other animals, personality psychology concerned itself with the problem of human motivation, conceived in terms of unobservable dynamics and promptings from within ... With its triple emphasis on the whole person, motivation, and individual differences, personality psychology has always held a rather tenuous and ambiguous position in American psychology (McAdams 1997, pp. 4-5).

Nevertheless Kelly was not intent on appending his work to that of others as the following indicates:

if we stopped to pay our respects to all the thinking, which has preceded and influenced what we had to say, we would never get it said. While we do not wish to appear to be historically unoriented, our plan is mainly to delineate a theoretical position for what it is and not for what its ancestry may be (Kelly 1955, p. 42).

At a subsequent conference on personality psychology he reiterated his position in stronger terms.

I am a fellow who has sworn off using most of the psychological constructs that have been tossed around during the last three days. For example, some time ago I discarded "motives" and have been living quite happily without recourse to "motivation" ever since. "Affect" makes no sense to me anymore; nor do "drives," "reinforcement," "stimuli," "responses," "emotion," or "cognition." As a matter of fact, I decided to abandon "learning" some years ago, a bold step that opened up a whole exciting new world to me (Kelly 1963, p. 221).

Avant-gardism may profit those who are in the realm of the artistic but certainly not those engaged in academic psychology. Kelly's dismissive approach did not serve him well.

### **Allport and Kelly**

Allport recognised personality psychology as a 'coherent and distinctive field of inquiry' (Craig, Hogan & Wolfe 1993, p. 5). His 'vision for personality psychology' was like Kelly's, 'a humanistic alternative to the prevailing mechanistic paradigms of stimulus-response psychology in the 1930s' (McAdams 1997, p. 7). Like Stagner (1937) he distinguished between psychological and the sociological levels of analysis. However, he differed from him in the degree of influence that he attributed to the interactions between persons and their society. Culture was important to Allport only to the extent that it became '*interiorized* within the person as a set of personal ideals, attitudes, and traits' (Craig, Hogan & Wolfe 1993, p. 11). Kelly's theory did not have a vocabulary, which allowed individual psychological functioning to be directly related to large-scale events and processes. It was a theory of individual processes whose range of convenience did not include social psychology (Jahoda 1988, pp. 11-12). Thus, Kelly

was closer to Allport than Stagner. Like Kelly Allport elevated the individual to pride of place. He said:

Thus there are many ways to study man psychologically, yet to study him most fully is to take him as an individual. He is more than a bundle of habits; more than a nexus of abstract dimensions; more too than a representative of his species is. He is more than a citizen of the state and more than a mere incident in the gigantic movements of mankind. He transcends them all (Allport 1937, pp. 566-7).

Allport criticised nomothetic methods concerned only about the discovery of regularities and uniformities characteristic of a whole class of objects. He equated such with attempts to come up with the 'generalised mind' that has nothing to do with the mind. It lacks 'locus, organic quality, reciprocal action of parts and self consciousness' (Allport 1937, p. 5). Just as Kelly (1955, p. 55) said in his individuality corollary that 'persons differ from each other in their construction of events' Allport (1937, p. 3) said that man is:

Separated spatially from all other men, he behaves throughout his own particular span of life in his own distinctive fashion.

However, whilst Allport was critical of unbridled attempts to apply nomothetic methods he did advocate the use of them in conjunction with idiographic techniques. The following extract indicates this:

In the field of medicine, diagnosis and therapy are idiographic procedures, but both rest intimately upon knowledge of common factors in disease determination by the nomothetic sciences of bacteriology and biochemistry. Likewise, biography is clearly idiographic, and yet in the best biographies one finds an artful blend of generalization with individual portraiture. A complete study of the individual will embrace both approaches (Allport 1937, p. 22).

Similarly Kelly (1955) said:

After he has conceptualized each of his cases, he [*the psychologist*] next has the task of further abstracting the individual constructs in order to produce constructs which underlie people in general (Kelly 1955, p. 43).

Thus, Kelly indicated a similar inclination to Allport.

Allport's concern was that psychology had appropriated methods from the 'austere elder sciences' (Allport 1937, p. 5). However, he argued strongly for both idiographic and nomothetic methods of enquiry to ensure that the investigation of individual lives did not become remote from 'psychological fact' representing only 'mathematical artifacts' (Allport 1937, p. 245). Allport was on the same wavelength as Kelly but Kelly did not articulate this clearly (Kelly, 1955, p.41). This is what causes frustration in working with Kelly's theory. One has to retrospectively assimilate it with earlier work as well as that which was contemporaneous.

### Critics of Kelly

Bruner (1956) said that Kelly's was 'a genuine and spirited contribution to the psychology of personality.' However, he also noted that:

With respect to ancestry Kelly cared little for it. One misses references to such works as Piaget's *The Child's Construction of Reality*, the early work of Werner and the writings of Harry Stack Sullivan, Lewin and Allport ... all of whom are on his side and good allies to boot (Bruner 1956, p. 356).

Appelbaum (1969) was particularly scathing as the following illustrates:

We are regularly offered a self-advertised avant-garde, which all too often is merely reactionary and uninformed. Kelly apparently believed he had to make up his own system, to start anew, to gather around him those who had the same complaints he had. He was a prophet with honor but little prophesy, a spokesman more than a speaker, his eminence an accident of time (Appelbaum 1969, p. 25).

In this quotation are veiled comments about Kelly's lack of academic propriety. He is castigated for his uncritical appraisal of other work and his apparent belief that none of that which had preceded him was of any relevance. Also implied is Kelly's avoidance of peer review except by those with similar inclinations. The title of Appelbaum's paper *The Accidental Eminence of George Kelly* says much about the regard he had for him.

Ryle (1985) argued that:

[PCT's] main weakness is in its isolation, its self-isolation. Kelly's rather cavalier dismissal of everybody else, particularly psychoanalysis and behaviorism, seems to have been taken on board by most personal construct theorists, and a serious attempt to relate the theory to other attempts at dealing with human behavior has not taken place (pers. comm in Neimeyer 1985, p. 113).

### **Absolving Kelly's Omissions**

Neimeyer (1985) suggested that an insight into the reasons for Kelly's omissions could be gained by understanding something of the man and his background. He reported that Kelly was born and brought up in the frontier farming community of Perth near Kansas where:

The rural isolation of the tiny farming community cultivated in its inhabitants a resourcefulness and sense of self-reliance that might have been less important in a more populous social environment (Neimeyer 1985, p. 10).

Kelly's self-reliance appeared to be reflected in

The *form* of his theorizing as well as its *content*. This is especially apparent in Kelly's failure to find intellectual support in compatible phenomenological and existential thinkers, while at the same time reinventing a homespun version of their philosophy for inclusion in his own theory (Neimeyer 1985, p. 13).

Neimeyer (1985) argued for a 'benign' interpretation of Kelly's approach. He concluded that Kelly was not purposely misrepresenting such work but that he had firsthand awareness of such 'kindred traditions'. He also indicated that Kelly's academic background, a 'bootstrap' education which included a 'patchwork of degrees in physics, mathematics and education before studying psychology - for a single year - and completing his PhD' may have inhibited his critical capacities (Neimeyer 1985, p. 13). In reading Kelly the feeling is not that he was deliberately setting out to misrepresent the work of others. However, he must stand convicted for hinting at a critique without any in-depth argument and for minimal attribution to others.



## Parallels with McDougall

Consider for example the work of William McDougall (1931). He defined an instinct as

An inherited or innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or, at least to experience an impulse to such action (McDougall 1931, p. 25).

Thus, the *instinctive response* is similar to *construing* which Kelly defined as 'placing an interpretation on what is construed' (Kelly 1955, p. 50).

Kelly argued that events are not necessarily duplicated but that there are aspects of them which are 'replicative' (Kelly 1955, p. 53). Construing then is the recognition or remembering of these replicative patterns in events. Similarly Bartlett (1932) said:

The first notion to get rid of is that memory is primarily or literally reduplicative, or reproductive. In a world of constantly changing environment literal recall is extraordinarily unimportant (Bartlett 1932, p. 204).

Remembering is 'an imaginative reconstruction or construction' based on an 'attitude towards a whole active mass or organised past reactions or experiences, and to a little outstanding detail which commonly appears in image or language form' (Bartlett 1932, p. 213). The parallels between Kelly's argument and those of Bartlett (1932) about remembering are striking. However, there was no mention of this in Kelly's work.

McDougall (1931) also recognised the significance of replication as the following indicates:

The oftener the object of the sentiment becomes the object of any one of the emotions comprised in the system of the sentiment, the more readily will it evoke that emotion again, because in accordance with the law of habit, the connections of the psycho-physical dispositions become more intimate the more frequently they are brought into operation (McDougall 1931, p. 109).

McDougall (1931) did not agree that instinctive processes were only conative. He said:

In view of the persistent tendency to ignore the inner or psychical side of instinctive processes, it seems to me important to insist upon it, and especially to recognize in our definition its cognitive and affective aspects as well as its conative aspect (McDougall 1931, p. 26).

Similarly Kelly said:

The classical threefold division of psychology into cognition, affection and conation has been completely abandoned in the psychology of personal constructs (Kelly 1955, p. 130).

### The Similarity of Sentiments and Constructs

McDougall (1931) said:

Emotional dispositions tend to become organized in systems about the various objects and classes of objects that excite them. Such an organised system of emotional tendencies is not a fact or mode of experience, but is a feature of the complexly organized structure of the mind that underlies all our mental activity. To such an organized system of emotional tendencies centered about some object [I] propose to apply the name "sentiment" (McDougall 1931, p. 105).

He also suggested that sentiments such as *love* and *hate* were organised such that they subsumed related affective and conative dispositions (McDougall 1931, pp. 107-8).

These ideas can be linked directly to Kelly's *Organization Corollary* which is that 'each person characteristically evolves, for his convenience in anticipating events, a construction system embracing ordinal relationships between constructs' (Kelly 1955, p. 56) and to the notion of superordinate constructs which subsume others (Kelly 1955, p. 57).

In discussing the structure of character McDougall (1931) said:

Well-developed character, I would say, is an integrated system of sentiments, a system that is a hierarchy dominated by a single master-sentiment and integrated by that dominance (McDougall 1931, p. 433).

Similarly constructs are organised in an ordinal manner such that:

A construct like *good-bad* occupies a relatively superordinate position within many people's systems and it subsumes many other constructs, ranging variously through actions, intentions, foods, clothes, paintings and so on (Bannister & Mair 1968, p. 29).

A subtle difference between these two statements is the former alludes only to positive dispositions as indicated by the use of the words 'Well-developed character' whereas the latter is open such that positive and negative dispositions are entertained.

Extending the notion of ordinancy Dalton and Dunnett (1990, pp. 9–10) likened the structure of construct systems to a scaffolding in which there can be *lateral* as well as ordinal relationships between constructs. Some constructs may be laterally implicated in a number of construct subsystems within the larger system. Others exhibit only an ordinal relationship to a relatively small number of constructs within a subsystem. Thus, construct systems can be described in terms of *ordinancy* and *scope*. However, all constructs are ultimately constrained by the *Range Corollary* which is that 'a construct is convenient for the anticipation of a finite range of events only' (Kelly 1955, p. 68).

McDougall (1931) preempted what Kelly termed the *bipolar* nature of constructs. He said:

We have the names love, liking, affection, attachment denoting those sentiments that draw one towards their objects, generally in virtue of the tender emotion with its protective impulse which is their principal constituent; and we have the names hate, dislike and aversion, for those that lead us to shrink from their objects, those whose attitude or tendency is one of aversion, owing to the fear or disgust that is the dominant element in their composition (McDougall 1931, p. 138).

Perhaps without realising it McDougall had expressed three distinct constructs, *love-hate*, *like – dislike* and *attachment – aversion*. Kelly stated explicitly that there can be no similarity without contrast, they are inherent in the same construct (Kelly 1955, p. 51). However, McDougall (1931) regarded love and hate as 'natively independent of one another or unconnected' (McDougall, 1931, p. 107). In this respect Kelly and McDougall appear to be at variance with one another.

However, if McDougall's remark is read in the context of Kelly's *Dichotomy corollary* which assumes a binary preference for one or the other pole of a construct (Kelly 1955, p. 63) then the two apparently different viewpoints can be reconciled. This is because the practical outcome of the corollary is the representation of construct poles as mutually exclusive sets whose members are the elements construed under each pole.

McDougall also alluded to *slot rattling* which is the tendency to oscillate between the two poles of a construct. McDougall discusses jealousy as an exemplar.

Jealousy arises when the object of the sentiment (love in this case) gives to another, any part of the regard thus claimed for the self. It is thus an unstable state of emotion, of which the most constant element is the painfully checked positive self-feeling, and which tends to oscillate between two poles, *revenge* and *reproach* according as one or the other person is prominently before consciousness (McDougall 1931, p. 119).

McDougall (1931, p. 109) acknowledged that emotional dispositions might be an organic constituent of an indefinitely large number of sentiments. He alluded to *fragmentation* when he discussed happiness. He said:

Happiness arises from the harmonious operation of all the sentiments of a well organized and unified personality, one in which the principal sentiments support one another in a succession of actions all of which tend towards the same closely aligned and harmonious ends. Hence the richer, the more highly developed the more completely unified or integrated is the personality, the more capable is it of sustained happiness in spite of the inter-current pains of all sorts. In the child or in the adult of imperfectly developed and unified personality, the pleasure or the pain of the moment is apt to fill or dominate the whole of the consciousness as a simple wave of feeling, whereas in the perfected personality it appears as a mere ripple on the surface of a strong tide that sets steadily in one direction (McDougall 1931, pp. 134-5).

From a personal construct perspective this statement suggests that happiness is attainable when construct subsystems are sufficiently independent and robust that they can withstand shocks without any threat of disintegration. This was the essence of the *Fragmentation Corollary* which assumes that construct subsystems which are 'inferentially incompatible with each other' (Kelly 1955, p. 83) can coexist without

producing conflict. Cognitively simple individuals may exhibit a degree of dependence between their construct subsystems that renders them more vulnerable when incompatibilities arise. On the other hand cognitive simplicity may provide a curious clarity.

Evidence of further congruence between Kelly and McDougall is indicated by the following remarks about the cognitive capacities of individuals:

We must recognize the existence of sentiments of all degrees of development from the most rudimentary upward; these may be regarded as stages in the formation of fully-grown sentiments, although many of them may never attain any degree of complexity or strength ... The sentiments may also be classified according to the nature of their objects; they then fall into three main classes, the concrete particular, the concrete general, and the abstract sentiments ... Their development in the individual follows this order, the concrete particular sentiments being, of course the earliest and most easily acquired (McDougall 1931, pp. 139-140).

Similarly Kelly (1955) recognised that people differed in their capacity to employ *abstract* versus *concrete* constructs. Dalton and Dunnett (1990, p. 10) described abstract constructs as those which subsume others that are concrete. There will tend to be less abstract/superordinate constructs than concrete/subordinate ones, such that a construct system will tend to look pyramidal in shape. Kelly (1955) said:

But we do see some individuals who are much more concretistic in their outlooks than are others. They have difficulty making the bridge from element to element unless the elements are laid out physically side by side. But even so, they must abstract the elements in some degree, else their lives would be hopelessly kaleidoscopic and there would be no possibility of internal organization (Kelly 1955, p. 110).

However, he also acknowledged that 'those who were more prone than others to use abstract approaches in one area might be less prone than others to use abstract approaches in another area' (Kelly 1955, p. 152). Thus, it is possible to observe people who exhibit both abstract and concrete construing depending on the domain under consideration.

McDougall (1931) argued that behaviour was motivated by goals that vary in clarity and in the extent of their realisation (McDougall 1931, p. 308). Kelly (1955) sidestepped the motivation issue. He argued that there was no need to entertain *push* theories which ascribed energetic properties to stimuli or *pull* theories which ascribed energetic properties to the person himself and called them needs. Man was 'delivered fresh into the psychological world alive and struggling' (Kelly 1955, pp. 36-7). The question is alive and struggling for what, towards what goal? To only accord agency to the individual does not adequately address the issue of motivation.

In summary it is evident that there were considerable synergies between the ideas of McDougall and those of Kelly. Therefore, it is surprising that Kelly did not acknowledge them.

### Kelly and Lewin

Kelly acknowledged field theory but failed to relate his work to Lewin's in a concrete manner. Clearly he was attracted to it. Alluding to field theory he said:

The directionality of man's behaviour is described at a higher level of abstraction than in our current theories, and some provision is made for the way the man himself structures his field (Kelly 1955, p. 39).

Field theory was not a system of psychology limited to a specific content. It was a set of concepts by means of which one could represent psychological reality. The concepts were broad enough to be applicable to all kinds of behaviour but also specific enough to represent a definite person in a concrete situation (Hall & Lindzey 1978, p. 386). Thus it is easy to see why Kelly could relate to Lewin. Their philosophical positions were similar.

Their theories were 'thoroughly psychological in character, which contrasted sharply with the more physical and physiological orientation of behaviorism' (Hall & Lindzey 1978, p. 342).

Lewin's theory helped to make a subjective frame of reference respectable at a time when objectivism was the dominant voice in psychology. The so-called inner determinants of conduct, such things as aspirations, values, and intentions, had summarily been cast out by an "objective" psychology in favour of conditioned reflexes, rote learning, and the automatic stamping in and out of stimulus-response bonds. Behaviorism had almost succeeded in reducing a human being to an automaton, a mechanical puppet who danced to the tune of external stimuli or jerked to the promptings of internal physiological drives, a robot bereft of spontaneity and creativity, a hollow person (Hall and Lindzey 1978, p. 342).

Lewin resurrected the individual 'as a complex energy field motivated by psychological forces and behaving selectively and creatively' (Hall & Lindzey 1978, p. 342). The person uses a map or conceptual representation of reality, which like any map functions as a guide to the user. This map also serves to acquaint the person with new facts about reality (Hall & Lindzey 1978, p. 389). The *life space* comprises a differentiated person surrounded by a differentiated psychological environment (Hall & Lindzey 1978, p. 393). Conceived in this way the life space is an ideal tablet upon which to inscribe personal constructs and their structural relationships. Construing is about erecting a structure. 'Constructs are those pieces of scaffolding comprising the structure itself' (Dalton & Dunnett 1990, p. 7). Like a map it acts as a guide to the interpretation of that which is observed. The basis of Kelly's theory would have been strengthened considerably if he had made theoretical linkages to Lewin's concept of the life space.

## Rehabilitating Kelly

It is reasonable to criticise Kelly for his lack of propriety. He came to psychology comparatively late and his background in the discipline appears to have been rather limited. Thus, his critique of rival approaches to personality psychology and the integration of his ideas with related work is thin. He may have been more widely acknowledged and his work would have been strengthened had he linked it more directly with earlier as well as contemporary developments. Kelly's omissions are a concern. However, his work and subsequent developments that demonstrate its versatility strengthen it as a basis for enquiry. Moreover, as noted by Eden (1988):

Kelly had enough respect for his own theory that, based on the theory, he designed a technique that would influence his own professional practice as a psychotherapist. There are few theorists who manage to match their theories to their practice and those that do command my respect (Eden 1988, p. 2).

Neimeyer (1985, p. 3) cautioned that his survey of PCP was affected by his position as a clinical psychologist. Similarly the review of PCP by Winter (1992) was primarily confined to a discussion of Kelly's work within the counseling context. However Kelly's theory and the repertory grid method have found avenues for expression in other fields such as cognitive mapping, knowledge acquisition, expert systems and management. Examples of contributions in these areas are Shaw and Gaines 1981; Gaines and Shaw 1981, Stewart and Stewart 1981; Eden 1988; Huff 1990 and VAN DEN Berg, Heiser & Commandeur, 1992. The happy coincidence of interests and the marriage of Mildred Shaw and Brian Gaines have been extremely productive. Together they have done much to promote Kelly's work and endeavoured to secure a central place for it in the field of knowledge acquisition and expert systems. Whilst Kelly's work predates the emergence of the interest in this area his theory and the repertory grid are as if they were purpose built for this line of inquiry. Examples of the diversity of contributions are papers on culture shock by McCoy, 1980, 1983; a paper concerning Austria's image as



a vacation destination by Embacher and Buttle 1989; and one on managers construing of a diversified business by Ginsberg 1989.

In this section Kelly's work has not only been criticised but also strengthened by retrospectively integrating it with Allport, McDougall's earlier work and with the work of Bartlett and Lewin. Based on the evidence it seems that Kelly was somewhat of a nonconformist. He wanted to stand alone to strike out on his own even though the price he paid for this was relative obscurity. His work should have achieved greater prominence but it did not. It had and still has much to commend it.

In the next section it will be demonstrated that Kelly's philosophy and his theory provides a sound basis for an idiographic methodology.

### **Subjective versus Objective Approaches to Research**

In social science research the subjectivist approach to research is often aligned with qualitative research methods and non-numeric modes of data gathering such as interviews. In contrast the objectivist approach is typically associated with quantitative methods. These methods emanate from the natural science approach that is founded on universal laws of cause and effect. However, these associations are narrow (Henwood & Pidgeon 1992, p. 98) and may lead to a unidimensional argument about subjectivity versus objectivity in research. Moreover, since disciplines such as psychology have appealed to the natural sciences to establish their bona fides, there have also been attempts to justify the subjective character of a qualitative approach by using assessment criteria, which apply only to so called objective or quantitative

methods. Yin (1989) provides a framework for case study research, which is compromised in this way. Instead of locating the methods within a philosophical context and allowing this election to give support to them, the text attempts to evaluate the case study approach against inappropriate criteria that have been excised from the quantitative tradition. Similarly Miles and Huberman (1984) parallel the conventional reliability and validity criteria of the hypothetico-deductive method with the notion of 'trustworthiness'. However since the naturalistic paradigm challenges the dualistic notion of the *knower* and the *known*, the criteria for judging the quality of research cannot be reduced to tactics for eradicating observer bias. The personal is always present in the research (Lincoln & Guba 1985, pp. 104-5).

Burrell and Morgan (1989) discuss assumptions which have 'direct implications of a methodological nature' (Burrell & Morgan 1989, p. 2). They concern ontology, epistemology, and human nature and are evaluated in relation to the subjectivist-objectivist approach to research in the social sciences. This broader conceptualisation which differentiates qualitative and quantitative research methods in a more rigorous and functional manner is discussed below.

### Ontology

Ontology can be characterised as the tension between nominalism, the idea that reality is constructed, and realism, the idea that reality is a given and has an objectively verifiable quality (Burrell & Morgan 1989, p. 3). This thesis adopts the nominalist position, which is primary thrust of the Psychology of Personal Constructs (Kelly 1955). What is important is how people construe the world rather than how it may be described in some objective sense. 'Everyday life presents itself as a reality interpreted by men

[sic] and subjectively meaningful to them as a coherent world' (Berger & Luckmann, 1975, p. 33). It is 'the reality *pare excellence*' (Berger & Luckmann 1975, p. 35).

The following evidences that Kelly (1955) might be interpreted as a realist:

The three prior convictions about the universe are ... that it is real and not a figment of our imaginations, that it all works together like clockwork, and, that it is something that is going all the time and not merely something that stays put (Kelly 1955, p. 7).

However, Kelly also said:

Man [sic] looks at his world through transparent patterns or templates, which he creates and then attempts to fit over the realities of which the world is composed. The fit is not always very good. Yet without such patterns the world appears to be such an undifferentiated homogeneity that man is unable to make any sense out of it. Even a poor fit is more helpful to him than nothing at all (Kelly 1955, p. 9).

These statements appear to be contradictory in respect to the opposition between nominalism and realism. However, whilst Kelly embraced both nominalism and realism he gave precedence to the former. He argued that individuals were not reactive to the environment, they possessed the capacity to represent it in terms of their personal constructs and to be creative. Kelly encapsulated this notion of creativity with his philosophy of *constructive alternativism*.

We assume that all of our present interpretations of the universe are subject to revision or replacement ... No one needs to paint himself [sic] into a corner; no one needs to be completely hemmed in by circumstances; no one needs to be the victim of his biography. We call this philosophy constructive alternativism (Kelly 1955, p. 15).

In short Kelly acknowledged the existence of a real world, its interconnectedness and its dynamic character. People attempt to grasp the real world but in fact only construct their own version of it. However, the constructions which individuals make are real to them (Dalton & Dunnett 1990, p. 3). The ontological character of Kelly's theory is not dichotomous with respect to nominalism or realism but one within which nominalism can exist within a realist framework. Nominalism finds expression in the construction systems of individuals and groups and may be likened to the Brunswik's *lens* analogy

(Brunswik 1934). The lens can be equated to the construct systems which individuals use to interpret the world.

Kenny (1988) argued that since Kelly recognised an objective and a subjective reality he was a 'trivial constructivist'. That is, one who endorses the notion that we invent or construct our own reality but at the same time believes in an 'objective ontological reality'. This would appear to be evidenced by Kelly's notion of validation. Kelly said:

What follows from our Fundamental Postulate is a particular notion of the kind of pay-off man expects from his wagers. Let us use the term validation. A person commits himself to anticipate a particular event. If it takes place, his anticipation is validated. If it fails to take place, his anticipation is invalidated. Validation represents the compatibility (subjectively construed) between one's prediction and the outcome he observes. Invalidation represents incompatibility (subjectively construed) between one's prediction and the outcome he observes (Kelly 1955, p. 158).

Kenny's argument might be accepted at face value since as cited earlier Kelly accepted that there was a real world out there. However, it would be better to liken Kelly to Maturana who described himself as a 'radical radical constructivist'. He and Kelly shared the same view in so far as both employed the notion of closure with regard to one's perceptions of the world.

For Maturana at the moment of perception there are no other possible constructions to be brought forth other than the construction actually made ... The personal system is 'organizationally closed' to the point where at the moment of experiencing we are constitutionally unable to distinguish between what we call a perception and a hallucination. We avoid the solipsist trap only through languaging in a community of co-observers who, retrospectively, decide whether we hallucinated or not ... Kelly also insisted on 'closing' the construct system in order to make sense of it and defined many of his theoretical constructs from 'inside' the person rather from the point of view of an observer. The following quote illustrates Kelly's use of closure: 'he can never make choices outside the world of alternatives he has erected for himself' (Kelly 1969, p. 8). (Kenny 1988, pp. 37-8).

Whilst Maturana relied on the dialogue with others for validation Kelly appealed to an internal consistency criterion of validity which Pepper (1942) identified as the standard test of 'truth' among contextualist theorists (Mancuso & Adams-Webber 1982, pp. 30-31). This is a significant point of difference between them. Bartlett (1932) argued that

the input from events is transposed onto existing schemata that have been constructed on the basis of past but similar events. If this was so, how can anticipations ever be 'invalidated' if the environment is assessed in terms of the same system of constructs that had been used to formulate those anticipations (Mancuso & Adams-Webber 1982, p. 31).

Warren (1964) provided an answer as the following indicates:

He (Kelly) makes the business of validation of constructs also a matter of construing, either at a different level of construing from the original construing or by employing different but systematically related constructs ... [the] criterion for a person's assessment of the outcome of his anticipations [is] the internal consistency of the present constructions within the person's construction system. Truth becomes a matter of coherence within a system rather than a correspondence with reality (Warren 1964, p 11, reported in Mancuso & Adams-Webber 1982, p. 31).

This search for internal consistency and coherence can be likened to Festinger's (1957) idea of *cognitive dissonance* which Kelly incorporated as an aspect of the change process by redefining guilt, anxiety, threat, fear, aggression and hostility within the context of personal construct theory. Kelly acknowledged that his conceptualisation of these psychological constructs was narrow and different to the 'current and common meanings attributed to the terms'. However, his was an attempt at a unifying 'reinterpretation of these important ideas consistent with the language of his theoretical position' (Bannister & Mair 1968, p. 31).

Kelly also used the concept of validation to further distinguish his work from the behaviourist paradigm, which had achieved almost universal acceptance in the 1950's. It illuminated the mechanistic character of behaviourism as an expression of realism. In this connection the term behaviourism is used to describe 'attempts to extend behaviorist principles to all aspects of human life' (Schwartz & Lacey 1982, p. x). The intention is not to demean the contributions which behaviourist research done in well-controlled laboratory settings have made to the understanding of human behaviour.

However, the viewpoint as exemplified by Skinner (1971), that behaviourist principles can hope to offer a *complete* account of human behaviour is rejected (Schwartz & Lacey 1982, p. ix).

Kelly said:

Sometimes it is said the living thing is "sensitive," in contrast to the nonliving thing, or that it is capable of "reaction." This is roughly the same distinctive characteristic of life that we envision. But we like our formulation better because it emphasizes the creative capacity of the living thing to represent the environment, not merely to respond to it. Because he can represent his environment, he can place alternative constructions upon it and, indeed, do something about it if it doesn't suit him. To the human living creature, then, the universe is real, but it is not inexorable unless he chooses to construe it in that way (Kelly 1955, p. 8).

Overall it makes sense to interpret Kelly's ontological position as fundamentally nominalist. This marks his work as anti-behaviourist. It also helps to explain why Kelly achieved only a passing mention in the psychology literature. However, as was shown in the previous section, Kelly exiled his own work by failing to erect it on a suitable and defensible platform.

### Epistemology

Epistemology, 'the grounds of knowledge', can be understood from two standpoints, positivism and anti-positivism.

*Positivism.* The essence of positivist epistemology is on the application methods emanating from the natural sciences (Burrell & Morgan 1989, p. 5). Detachment and impersonality are typical of such approaches. Smith (1986) said:

Logical positivism arose ... as an affirmation of the natural scientific world-view ... Most of its proponents ... were trained as scientists, mathematicians and logicians rather than as philosophers. ... the assertions of traditional philosophy could purportedly be shown to belong to logic (if analytic), to science (if empirically verifiable), or else to not be a genuine assertion at all (Smith 1986, p. 3).

Pearson (1951) exemplified the positivist position of the late nineteenth and early twentieth century. In describing the scientist he said:

He will scarcely be content with merely superficial statement, with vague appeal to the imagination, to the emotions, to individual prejudices. He will demand a high standard of reasoning, a clear insight into facts and their results, and his demand cannot fail to benefit the community at large (Pearson 1951, p. 14).

Brent (1984) argued that the hierarchical ordering of the sciences was derived from late nineteenth and early twentieth century logical positivism. On this basis physics acquired the status of 'queen of the sciences' followed by chemistry and biology. Psychology appeared as one of the 'stepsisters', a Cinderella 'the legitimacy of whose birth was at best uncertain' (Brent 1984, p. 3). He also argued that the boundary between the so-called hard and soft sciences 'began to crumble' in the early twentieth century. However, apparently those promoting psychology as a science still felt the need to prove its legitimacy. Consequently much of the empirical work in psychology was carried out using the 'statistical-dragnet' (Kelly 1955, p. 32).

The statistical-dragnet method provides a quick and sure exploitation of ideas that have already been expressed or applied. It tends to be sterile from the standpoint of developing new ideas, and is commonly falls into the error of assuming that the greatest volume defines the greatest truth (Kelly 1955, p. 34).

Factor analysis, multiple regression and path analysis reflected efforts to imbue the soft disciplines with the authority of the natural sciences such as physics. Similarly the application of calculus methods in economics is a striking example of how mathematics has been applied to the study of human behaviour.

*Anti-positivism.* Anti-positivism rejects the notion of the researcher as a detached 'observer' who makes inferences about human understanding and behaviour from that standpoint.

Polanyi (1949) highlighted the need to recognise the diversity in human behaviour as indicated by the following:

The most important pair of mutually exclusive approaches to the same situation is formed by the alternative interpretations of human affairs in terms of cause and reasons. You can try to represent human affairs in terms of their natural causes. This is in fact the program of positivism to which I have referred before. If you carry this out and regard the actions of men, including the expression of their convictions, as a set of responses to a given set of stimuli, then you obliterate any grounds on which the justification of those actions or convictions could be given or disputed (Quoted in Schwartz, 1974, p. 57).

From an anti-positivist viewpoint the researcher can only understand another by occupying his or her frame of reference (Burrell & Morgan 1989, p. 5). Kelly reflected this perspective drawing on the phenomenological tradition to support his position.

The neophenomenological point of view is perhaps best expressed by Syngg and Combs, whose basic postulate is: "All behaviour, without exception, is completely determined by and pertinent to the phenomenal field of the behaving organism." The position emphasizes the fact ... that the outlook of the individual person is itself a real phenomenon, no matter how badly he may misrepresent the rest of reality to himself ... the psychologist ... should not assume that an erroneous view lacks any substance of its own. Moreover, the psychologist should not necessarily infer that what one person thinks has to be like what another would think in the same circumstances, nor can he accurately infer what one person thinks from what is publicly believed to be true (Kelly 1955, p. 40).

Kelly refined this statement by stating:

We cannot of course crawl into another person's skin and peer out at the world through his eyes. We can, however, start by making inferences primarily upon what we see him doing, rather than upon what we have seen other people doing ... This means of course that each study of an individual becomes a problem in concept formation for the psychologist. After he has conceptualized each of his cases he next has the task of further abstracting the individual constructs in order to produce constructs which underlie people in general (Kelly 1955, p. 43).

In reading the last part of this extract one might align Kelly with the behaviourists. He was advocating a search for generalities or laws that could be used to explain human behaviour. Like Skinner he accepted the epistemological position that relates the truth statements in the behavioural sciences to success in prediction and control. However Kelly said, 'it is not that man is what Skinner makes of him, but rather what Skinner can do, man can do - and more' (Kelly 1969, p. 136). Kelly's model of human behaviour was not a behaving organism which Bannister (1966) characterised as a 'ping pong ball



with memory'. Kelly viewed the people as personal scientists whose processes are channelled by their attempts to predict and control events using their system of personal constructs. Kelly's theory is self-referential (Mancuso & Adams-Webber 1982, p. 10).

One might pre-judge researchers who use the grid elicitation method as positivists. The method itself has a clinical and detached feel. However, those who are committed to the philosophy of personal construct psychology see this as a necessary requirement to maximise the participant's opportunity for self-expression. The clear intention is to be directive but unobtrusive and highly sensitive to the viewpoint of the participant. It is worth noting here the use of the term participant in contrast to that of respondent. The former reflects the active role of both parties in the research process, particularly the person being interviewed. The latter alludes to the person giving of themselves as passive respondent to external stimuli.

### **Human Nature**

Human nature can be described in terms of two opposing poles. At one pole is *determinism*, which accords no agency to human beings, at the other is *voluntarism*, which depicts human beings as completely autonomous and free willed (Burrell & Morgan 1989, p. 6). Kelly's work appeared at a time when the 'dominant notion was complete determination from the outside'. However, 'the battle won', the either/or position can be relaxed. Thus, whilst people have the ability to shape their own lives to some extent, they are also affected by events and processes over which they have no control (Jahoda 1988, p. 6). This is the position adopted in this thesis.

## **The Methodological Direction**

In summary *constructive alternativism* which is fundamentally nominalist and anti-positivist represents the philosophical basis for the current research. In regard to human nature the philosophy is essentially voluntarist. The research embraces the fundamental postulate of personal construct psychology that people construe the world, which comprises other people, events, objects and situations. Personal constructs are the basis for patterning experience. Unless they are dysfunctional they inject efficiency into the business of living. Well developed constructs reflect pattern recognition similar to that of doctors who come to medical diagnosis with a kind of sixth sense which Polanyi (1966) described as *tacit knowledge*, a notion that was also a theme in Bartlett's (1932) work on remembering.

Consequently it was decided to employ the interpretive paradigm in which the primary concern was to understand the subjective experience of the individual as an expression of reality (Burrell & Morgan 1989, p. 28). Thus the aim was to develop idiographic processes that would allow participants the maximum opportunity for self-expression. The next section discusses methods of construct elicitation. The results of two preliminary interviews that were conducted as a basis for evaluating these methods are reported.

## **Evaluating Methods of Construct Elicitation**

Kelly (1955) originally described six methods for construct elicitation. Two of the methods described were 'The Self-Characterisation' and 'The Minimum Context Card Form' (Fransella and Bannister 1977, p. 14). From this point on the latter method will be referred to as the *triadic method*.

## **The Self-Characterisation**

This is the least structured of all the methods described by Kelly. The basis of the method is to elicit a self-description from a person by asking them to provide a sketch of themselves from the viewpoint of a third party, say a friend. The logic of the method is that in everyday conversation people express personal constructs perhaps unknowingly. The self-characterisation is an attempt to come close to this though perhaps not as effective because of its contrived nature. Although the aim of the method is to secure an elaboration of general structure rather than specific detail, the method can be adapted to elicit context specific self-descriptions (Fransella & Bannister 1977, pp. 18-19).

Singer and Salovey (1993, p. 12) argued that:

Each person has a unique collection of autobiographical memories and that these memories can be examined in an effort to define a person. Imagine that each individual carries inside his or her head a carousel of slides of life's most important memories. These slides have been carefully selected to represent the major emotionally evocative experiences that a person has ever had ... Although memory is perpetually taking snapshots of each and every experience that we encounter, there always emerges a core of slides to which we return repeatedly. This dog-eared bunch of slightly obscured or distorted images comes to form the central concerns of our personality.

The concept of self-defining memories is linked to Tomkins (1979, 1987) script theory. Script theory recognises the powerful influences of cognition and the need to reduce ambiguity into patterned meaning (Singer & Salovey 1993, p. 22). Thus the self-characterisation and script theory share common features.

## **The Triadic Method**

Under this method a participant is asked to supply names for role titles such as Mother, Father and Disliked Person. These form the elements for a repertory grid. Elements are then selected in triads and the participant is asked to describe some important way in which two of them are like and thereby different from the third. After the reply is recorded the participant is asked to distinguish the third element in terms of a contrast

to the first two. The descriptions elicited are taken to represent the explicit (emergent) and implicit (contrast) pole of a construct. The process continues until sufficient constructs have been elicited. Whilst Slater (1977, p. 31) suggested that a grid contain a minimum of ten constructs Easterby-Smith (1981, p.17) argued that a grid containing ten elements and ten constructs may take two hours to complete. Thus, the triadic method is time consuming.

### **Cognitive Mapping**

Eden (1988) developed a cognitive mapping method, which although founded on Kelly's theory did not utilise the repertory grid method for the elicitation of constructs. Eden (1988, p. 3) said that 'a grid is constraining in the degree of richness that can be captured' and large grids are 'unwieldy to elicit and even more confusing to analyze'. He tried to encompass more richness into models by using Hinkle's (1965) Implication Grids. However, this 'simply added to the richness of the system of linkages between the constructs'. Because of these difficulties he created his own method of elicitation. The method 'yields images of cognitive processes and is an attempt to utilize experts beliefs and cognition about ill-structured social relationships' (Lee, Courtney & O' Keefe 1992, p. 27).

Eden (1988) set out the rationale for his methods. In describing his maps he said:

The map reads as follows: each block of text represents a "construct" which has two parts to it — the first part is the "presented pole" of the construct and the second...is the contrast or psychological opposite. The linkage between the constructs represents the meaning of the construct in terms of the explanations and consequences — these links are not taken to be causal in a precise way (Eden 1988, pp. 4-5).

Thus, in cognitive mapping, cause refers to the implications that are formed because of the network of associations drawn between the constructs in a cognitive map. In technical parlance, cognitive maps are *directed graphs* such that unidirectional arrows

link constructs. When such an arrow has a negative sign attached, the indication is that the emergent pole of the construct at the tail of an arrow implies the implicit pole of the construct at the head of the arrow (Eden and Ackermann 1992, p. 310).

Cognitive mapping in the style of Eden bears considerable resemblance to Quillian's (1968) work on semantic networks. In a semantic network concepts are represented as nodes and arcs between the nodes represent the relationship between the concepts. Concepts within semantic networks attain their meaning by the connections, which they have with other concepts in the network (Zaff, McNeese & Snyder 1993, p. 91).

Eden's method is different from that of Axelrod (1976) which used documentary evidence as a surrogate for cognition. Maps produced by such a method could not claim to be representations of thinking (Eden, Ackermann & Tait 1993, p. 2). On the other hand Eden, Ackermann and Tait (1993, p. 2) cautioned that an interview is a process of articulation which is also a surrogate for thinking. It is also 'a social and political act that focuses thinking in particular directions'. An interview attempts to capture the meaning of a situation, which is abstracted from the universe of both physical and social situations that constitute the environment in which a person lives. These situations are not objective but psychological such that they reflect the 'acquired meaning', 'not the learned nature of situations'. This is a different conception to that used in experimental psychology where the focus of the research has not been on the situation per se, but on person's behaviours under controlled stimulus conditions (1983, pp. 94-7). Despite these caveats Eden claimed that 'well run one-to-one interviews are likely to be the best method for eliciting cognitive maps' (Eden 1993, p. 2).

## **Trialing Methods of Construct Elicitation**

In the early stages of the present research four interviews were conducted with married men who were fathers at varying stages of the life course. The purpose was to resolve a method of construct elicitation and also to explore work, family and relationship issues. The self-characterisation and an augmented form, which incorporated a cognitive mapping protocol, were trialed. Thus the self-characterisation and cognitive mapping were evaluated as stand-alone methods and as a composite for the conduct of the main study. The interviews in which the self-characterisation and the augmented form were trialed are reported and discussed in appendix 1.

## **Results of the Trials**

*The Self-Characterisation.* The self-characterisation method, which was employed in the first interview, was successful because the participant was expansive and detailed about his life experience. However, whilst it was indicated that the self-characterisation would be useful in providing a good overview of individuals it was not evident that it would easily yield context specific data about the work and nonwork domains without significant modification. Moreover, the time required to transcribe interviews was in the ratio of six to one. Thus, it became apparent that this would prohibit the use of any approach based on a semi-structured interviews even if it were refined to focus more on context specific issues.

*Cognitive Mapping.* The cognitive mapping protocol yielded encouraging results but it was not an easy task to develop the map. Whilst the map had the form of a directed graph the analysis was limited to reporting measures such as the density of linkages within them. Since the arcs were not weighted no quantitative measure of the relationship between constructs was available. Langfield-Smith and Wirth (1992, p.

1135) showed that the arcs in a cognitive map could be weighted such that they reflect not only the direction of causality between the constructs but also the strength of each relationship. This permits matrices to be derived from which various quantitative measures of the relationship between the constructs can be derived. This development was encouraging. However, a significant problem that did not appear to be easily resolvable through cognitive mapping was the delimiting of context. An advantage of the repertory grid is that elements can be supplied or elicited such that context is delimited. This does not compromise the idiosyncratic nature of construing since only element types need be specified. The only requirements are that elements be homogenous, that is drawn from the same categories and representative of the area to be investigated (Easterby-Smith 1981, p.10).

### **Choosing the Repertory Grid**

The repertory grid method permits formal analysis but it is 'more akin to conversation' (Fransella & Bannister 1977, p. 111). Thus, it encompasses attractive features of qualitative methods but also permits quantitative analysis to be carried out. By carefully specifying the context for the elicitation construct subsystems can be explored in depth. This brings efficiencies to the process of analysis within and across cases. Brown (1992) evaluated the repertory grid and a number of other data gathering methods. It was judged to be a superior technique in respect of the richness that can be achieved. However, it was also judged to be demanding in respect of investigator skill and the time required in the administration of the technique. A definite advantage of the grid was its amenability to quantitative analysis and its synergy with Kelly's theory.

It was resolved that the investment of time required to become proficient at grid elicitation would pay dividends. For these reasons an election was made to proceed

with the development of the repertory grid as the principal investigative tool to be used in the research. It would be supported by other self-report data emanating from questionnaires.

Intimately related to the use of repertory grids are the cognitive structures, which are inferred from them. This is the focus of the last section in this chapter.

### **Cognitive Structure as Form and Content**

Structure is one of the most widely used concepts in the modern sciences. However, in modern psychology approaches to structure are often 'grounded in the data field of some particular branch' of the discipline (Brent 1984, p. 9). Understanding structure is a precursor to proper analysis. Thus the common features of structures are described below.

A structure is a system in which the constituent parts stand 'in a set of relatively invariant relationships to one another'. These relationships are the *form* and the 'constituent parts' are the *content*. For any system, structure is distinguished from 'an arbitrary assemblage or a transitory process' by 'the minimum time interval', which 'is the shortest time a set of relationships must remain invariant in order to be considered a structure'. This minimum time interval is different to the 'life span' of a structure which is the amount of time over which the relationships in a structure remain invariant (Brent 1984, pp. 9-11). Thus whilst the concept of structure implies duration and stability change is not precluded.



## **A Constructivist View of Cognitive Structure**

Writing about cognitive structure Scott (1962) said that:

As a preliminary attempt it may be useful to regard the *content* of cognition as consisting of concepts of objects and their attributes, while the *structure* of cognition refers to the relations among these concepts ... The varieties of cognitive content are almost limitless, but they may be subsumed by such rubrics as attitudes, beliefs, values etc. Meaningful structural properties are probably more limited in number, including characteristics like differentiation, integration, rigidity, flexibility and so forth (Scott 1962, p. 405).

From a constructivist viewpoint constructs are the content of cognitive structures, whilst the relationships between them comprise the form. The activities which give rise to the content of psychological structures include 'not only sensory and motor acts, but also such acts as thinking, feeling, listening, paying attention and cooperating (Brent 1984, p. 10). This accords with Kelly (1966) who argued that whilst he had been explicit about constructs it was not his intention to unduly emphasise the cognitive character of constructs.

### **The Primacy of Affect**

Piaget (1971) distinguished physiological interactions 'which are of a material nature' from psychological responses that are 'of a functional nature'. Psychological responses comprise 'two essential and closely interdependent aspects: an affective aspect and a cognitive aspect'. Affect and cognition are inseparable, but distinct. They are inseparable because all interactions with the environment involve a structuring and a valuation. They are distinct because these two aspects of behaviour cannot be reduced to one another (Piaget 1971, pp. 4-6).

Zajonc (1980) suggested that affect is primary and that cognition and affect are under the control of separate and partially independent systems (Zajonc 1980, p. 151). He said that:

Affective reactions can occur without extensive perceptual and cognitive encoding, are made with greater confidence than cognitive judgments, and can be made sooner ... Affect dominates social interaction, and it is the currency in which social intercourse is transacted ... affect ... is transmitted not only by the verbal channel but also by nonverbal cues as well, cues that may in fact carry the principal components of information about affect (Zajonc 1980, pp. 151-3).

Zajonc questioned the submergence of Wundt's position of affective primacy in contemporary psychology. Wundt said that:

When any physical process rises above the threshold of consciousness, it is the affective elements, which, as soon as they are strong enough, first become noticeable. They begin to force themselves energetically into the fixation point of consciousness before anything is perceived of the ideational elements ... They are sometimes states of pleasurable or unpleasurable character, sometimes they are predominantly states of strained expectation ... Often there is vividly present ... the special affective tone of the forgotten idea, although the idea itself still remains in the background of consciousness ... In a similar manner ... the clear apperception of ideas in acts of cognition and recognition is always preceded by feelings (Wundt 1907, pp. 243-4 quoted in Zajonc 1980, p. 152).

Wundt's suggestion that the affective quality of experience is remembered and vivid was mirrored in the work of McDougall (1931) and Bartlett (1932). McDougall (1931, pp. 33-4) said:

Our emotional and conative tendencies become directly associated by experience with many objects to which we are natively indifferent; and not only do we not recall the experience through which the association was set up but in many such cases we cannot do so by any effort or recollection. In this way some particular odour, some melody or sound, some phrase or trick of speech or manner, some peculiar combination of colour or effect of light upon the landscape, may become capable of directly exciting some affective disposition, and we find ourselves suddenly swept by a wave of strong emotion for which we can assign no adequate cause.

Similarly Bartlett (1932, p. 204) wrote:

Ask the observer to characterise this general impression psychologically, and the word that is always cropping up is 'attitude' ... Attitude names a complex psychological state or process which is very hard to describe in elementary psychological terms. It is however, as I have often indicated, very largely a matter of feeling or affect (Bartlett 1932, pp. 206-7).

In postulating the primacy of affect Zajonc (1980) argued like McDougall (1931) and Bartlett (1932) that affective reactions may become separated from content. When reminded of a book, a movie or an interpersonal conflict, people may find it difficult to recall content, but have little difficulty in recalling the affective quality of the experience.

Affect is readily retrieved and may in fact be independent of cognition. Some affective experiences may not be accompanied by any cognitive content (Zajonc 1980, pp. 159–160).

The importance of affect in memories concerning the self is reflected in contemporary theories of personality. Singer and Salovey (1993, p. 12) describe *self-defining memories* as *affective, vivid, repetitive and linked to other memories*. In addition these memories may focus on 'enduring concerns' or 'unresolved conflicts'. Singer and Salovey (1993) also spoke of the inertia, which the personalised construction of the world may engender. They said:

Although truth is inevitably a construction, or personal construct, it holds the *same* *story* of lived reality for the individual. Until such truths are dislodged, if they ever are by new events powerful enough to force accommodation, the accumulated scripts form their lives' epistemology-their essential way of knowing themselves, others and the world around them (Singer & Salovey 1993, p. 38).

If construing is primarily affective then resistance to change can be expected. Such resistance will vary according to the extent of the challenge posed to the person's constructs. If the challenge is extensive and implicates core constructs then resistance to change may be considerable. For example, Zajonc (1980) argued that affective judgements are irrevocable. Rightly or wrongly people tend to believe their 'hot cognitions' (feelings). Hot cognitions are seldom subjectively false and tend to be impervious to persuasion by communication. Because they feel right, they tend to be fixed. If we take a dislike to someone, even if only on the basis of a brief encounter, we are not easily swayed in our view. Thus, the subjective validity of affective responses works against change.

We are not easily moved to reverse our impression of a person or of a piece of music. We trust our reactions, we believe that they are "true" and that they accurately represent an internal state or condition (Zajonc 1980, p. 157).

Affective reactions often implicate the self. Whilst cognitive judgments deal with qualities which reside in the stimulus object, affective judgements implicate both the stimulus

objects and the 'ideal preference point of the person'. For example the statement that 'this cat is black' is not affective whereas the statement that 'I dislike this black cat' is affective as well as descriptive (Zajonc 1980, p. 157).

Osgood, Suci and Tannenbaum (1957) showed that in the triad of meaning (cognitive, affective and conative) affect was the primary basis of discrimination. Osgood (1962) demonstrated convincingly that the evaluative (feeling) factor was dominant not only among people who shared the same language and culture but also 'between people differing widely in language and culture'. Results of factor analyses of semantic differentials were reported for six countries (America, Holland, Finland, Belgium, Japan and Canada) in which the first factor was evaluative and was dominant by a substantial margin in relation to potency and activity. On average the first factor accounted for 46 per cent of the variance (range 42 to 49 per cent). In contrast potency averaged twelve and a half percent (range seven to sixteen percent) and activity eight and a half per cent (range seven to ten per cent) (Osgood 1962, pp. 14-16). However, Scott (1963) argued that in the individual case the 'generality of affective meaning' (Osgood, 1962, p. 12) is conditioned by whether a person exhibits a simple or complex cognitive structure. He proposed and provided evidence that:

Simple cognitive structures tend to consist of attributes which are not well distinguished from the affective, whereas complex structures include a number of additional dimensions all of which cannot therefore, be highly correlated with the affective attribute (Scott 1963, p. 69).

Similarly whilst Crockett (1965, p. 48) argued that 'cognitive processes are similar for all domains of content', Bieri (1955, p. 266) proposed that complex individuals have 'versatility in both simple and complex behavioral realms'. Complex processes subsume simple ones, 'the abstract is superordinate to the concrete (Dalton & Dunnett 1990, p. 10).

The context to which construing is related may also be significant such that because of their genesis some cognitive attributes may closely associated with affect whilst others may be relatively affect free (Scott 1963, p. 73).

In summary, Kelly (1955) argued against interpreting his theory as purely cognitive. Before him Wundt (1907), McDougall (1931) and Bartlett (1932) advocated the primacy of affect as have more contemporary thinkers such as Piaget (1971) and Zajonc (1980). It also appears that people vary in their capacities such that those with simple cognitive structures are less versatile (Bieri 1955) and give greater credence to affect than do complex individuals (Scott 1963, Forgas 1983). Context may also affect the character of constructs such that they may be primarily affective in some contexts, cognitive in others or a mix of cognitive, affective and conative in others (Scott, 1963). This was observed in the current research.

### **A Definition of Cognitive Structure**

Zajonc (1980) said that concepts or categories are the means by which a person discriminates objects and events in his environment (Zajonc 1980, p. 159). However, Kelly (1955, p. 133) insisted that constructs are not the same as categories as the following indicates:

A construct is a two-ended thing, not merely a category of likeness with no inferred difference in the offing. One cannot refer to the likeness aspect of the construct without simultaneously invoking the difference aspect of the construct.

Kelly (1966) repeated his incantation as follows:

Certainly it is important not to consider a construct as another term for a concept, else a major sector of the arena in which constructs function will be obscured from view (Reported in Bannister and Mair 1968, p. 35).

In order that Kelly's approach may be followed the term construct has been substituted for the term concept in Zajonc's definition of structure below. This does not alter the validity or the utility of the definition. The definition is:

A cognitive structure is an organised subset of the given cognitive universe in terms of which the individual identifies and discriminates particular object(s) or event(s). The morphological properties of cognitive structures describe various relationships among *constructs* (Zajonc 1980, p. 159).

Thus, constructs are the content of a cognitive structure and the relationship between them is the form. This definition of cognitive structure is consistent with the general definition of structure advanced by Brent (1984) as both form and content. Defining and thus analysing cognitive structure in terms of its form and content is a balanced approach. It will be demonstrated that much of the literature in the area of personal construct psychology has been preoccupied with measures of form while often ignoring content altogether.

### **Developmental Aspects of Cognitive Structure**

It is limiting to think of a cognitive structure as reaching a terminal state since this implies stagnation. Piaget (1971) managed to amalgamate the temporal and the developmental aspects of cognitive structure as the following indicates:

Every cognitive structure is to be thought of as a particular form of equilibrium, more or less stable within its restricted field and losing its stability on reaching the limits of the field ... These structures, forming different levels, are to be regarded as succeeding one another according to a law of development, such that each one brings about a more inclusive and stable equilibrium for the processes that emerge from the preceding level (Piaget 1971, p. 7).

This developmental view is consistent with more general conceptions of change such as the punctuated equilibrium theory of change (Gersick 1991, p. 11). It also resembles the concept of *epigenesis*, the notion that anything that grows has a ground plan and that out of this ground plan the parts have arisen to form a functioning whole (Erikson 1968, p. 92).

However, as indicated by the following Levinson (1986) did not subscribe to the view that movement from one stage to another is always positive.

Like Erikson and Freud, I define each period in terms of its developmental tasks ... Unlike Piaget...I do not identify a particular structure as the optimal one for a given period, the life structures generated in any period are infinitely varied. Phase 3 comes after phase 2 and to some extent builds upon it, but phase 3 is not necessarily more "advanced" (Levinson 1986, p. 10).

Thus, not all periods of change result in positive outcomes, regressions are possible.

### **The Articulation of Constructs**

In theory construct elicitation is a relatively simple process. Select an area for investigation, generate an appropriate set of elements, and then use the method of triads or some similar technique to elicit constructs. Alternatively one may opt for methods such as the self-characterisation or text based descriptions from which to distill constructs. However all is not as simple and straightforward, as it would appear. Constructs can be difficult to elicit when they are *tacit* (Polanyi, 1966). Similarly Shanteau (1987) listed fourteen characteristics that can be used to describe expert decision-makers two of which were automaticity of cognitive processes and an inability to articulate their decision processes (Shanteau 1987, p. 293). Broadly speaking people may be considered as experts in their own life space such that they exhibit automaticity in their application of constructs to events. Thus, they may be unable to articulate all of the constructs that they employ. Many are internally meaningful yet difficult to express in verbal form and thus they are *tacit*.

Kelly annunciated this as the following indicates:

A person is not necessarily articulate about the construction he places upon his world. Some of his constructions are not symbolized by words; he can express them only in pantomime. Even the elements which are construed may have no verbal handles by which they can be manipulated and the person finds himself responding to them with speechless impulse (Kelly 1955, p. 16).

Whilst accepting Kelly's view a distinction should be made between the inability of individuals to articulate tacit constructs and *social competence*. Forgas (1983) depicted social competence in terms of higher level cognitive skill and the ability to detect ambiguity and subtleties in the social world. Higher levels of social competence are suggested by some of the other characteristics that Shanteau (1987) attributed to experts. These are highly developed perception, the ability to see what others cannot, an ability to distinguish relevant from irrelevant information, an ability to simplify complexities, confidence in themselves and their abilities, good communication skills, and adaptability (Shanteau 1987, p. 293). Landfield (1980) introduced the dimension of *perspectivism-literalism* as another way of viewing social competence. Perspectivism is the ability to conceptualise thoughtfully, complexly, and integratively. Literalism finds expression in the 'excessive tightness or looseness' in affect, cognition and conation which constitute the triad of knowing. Perspectivism implies an ability to construct hierarchies of meaning, to step back from the immediacy of an event and employ higher order general comprehensions within a system of personal meanings. Perspectivism is the ability to understand the general and the specific and to be reflective (Landfield 1980, p. 290).

Kelly (1955) addressed literalism and perspectivism indirectly within the context of *permeable and impermeable* constructs.

A construct is permeable if it will admit to its range of convenience new elements which are not yet construed within its framework. An utterly concrete construct...would not be permeable at all ... In our own usage a permeable construct is not necessarily loose, inconsistent, comprehensive or tenuous ... When we say that a construct is permeable we refer only to the particular kind of plasticity we have described — the capacity to embrace new elements (Kelly 1955, pp. 79-80).

Kelly used the term *plasticity* to great effect here. It evokes images of those who have a flexible nature in contrast to those who display a rigid personality style. Thus, one can



align literalism with impermeability or rigidity and perspectivism with plasticity or flexibility. Of the two personality attributes perspectivism is probably to be preferred since it also subsumes an ability to be literal or narrow if required. The literalist cannot usually employ perspectivism. However, both of these attributes can have pathological consequences at their extremes. Extreme literalism is indicative of rigidity whilst extreme perspectivism may resemble chaotic behaviour.

Landfield (1980) also pointed out that the perspectivism and literalism did not define some new body of research but were intended to:

Pull together many observations of human functioning including abstractness, concreteness, complexity, openness, hierarchy, curiosity, flexibility, creativeness, impulsiveness, rigidity, denial, bigotry, repression, guilt and intolerance of ambiguity (Landfield 1980, p. 289).

Thus, literalism may be indicative of a cognitive structure that is concrete in its content and simple in its form whereas perspectivism may point to a cognitive structure that is abstract in its content and complex in its form.

In summary, a cognitive structure can be represented by constructs, which exhibit both form and content. The form is revealed by the pattern of invariant relationships between constructs. The content, are the constructs themselves. The final section in this chapter addresses methods for analysing the form and content that underlie a cognitive structure.

### **The Form of Cognitive Structures**

Research about form in cognitive structures has occupied a central place in the PCP literature. The focus of the work has been cognitive complexity as a measure of form and its utility as such. The work by Jones 1954; Bieri 1955; Bannister 1960,1962 and Bieri 1966 exemplified this. By 1977 cognitive complexity had emerged as an

independent area of research (Fransella & Bannister 1977, p. 61). The concept of 'cognitive complexity has been linked to a variety of social behaviors including empathetic abilities, social perspective taking and communication' (Applegate, Kline & Delia 1982, p. 193). Thus, research in this area has wide-ranging implications.

Work on cognitive complexity is situated 'at the junction of two converging streams of theoretical activity in psychology' (Bieri 1966, p. 13). The first is the work, which views cognitive structures as the mediating mechanism in a person's encounters with the world. Bartlett (1932), Tolman (1948) and Lewin (1951) were key contributors in this area. Research on cognitive complexity also highlights the inquisitiveness of people and the versatility of their behaviour. Thus, from a philosophical point of view people do not just react to external stimuli, they are also interested in learning about and understanding the environment (Bieri 1966, p. 13). Kelly's work embodies these converging streams.

Although Bieri (1955) discussed the concept of cognitive complexity-simplicity and demonstrated a method of measuring it he defined the concept in a subsequent paper as:

The tendency to construe social behavior in a multidimensional way, such that a more cognitively complex individual has available a more versatile system for perceiving the behavior of others than does a less cognitively complex person (Bieri 1966, p. 14).

He described cognitive complexity as:

An information-processing variable which enables us to predict how an individual transforms specified social stimuli into kinds of social or clinical judgements. One important feature of such an approach we feel, is that it brings this cognitive structural variable into closer relation to the stimulus conditions within which social perception and judgement occur (Bieri 1966, p. 15).

Thus, Bieri addressed not only the response to social stimuli but also the nature of the stimuli themselves. He contrasted his approach with the response-centered work of the

1971

cognitively oriented theories of Piaget (1950) and Kelly (1955), and the dimensional analysis of meaning exemplified in the work of Osgood, Suci and Tannenbaum (1957). He argued that there were methodological as well as theoretical advantages to be gained from a greater concern with the nature of the stimulus in research into cognitive structures.

Because cognitive complexity subsumes the ability of a person to differentiate among a number of dimensions of social behavior, we would apply our stimulus analysis in terms of the dimensional qualities of the input with which the person is asked to deal. One can speak of differentiation in terms of both the cognitive structure of the judge as well as in terms of the stimulus information being construed by the judge (Bieri 1966, pp. 17-18).

Bieri (1966) was elaborating on the idea of simple and complex behavioural realms, which he had first discussed in 1955. He acknowledged the difficulties in specifying 'the relative dimensionality of a social stimulus' (Bieri 1966, p. 18). However, the importance of his observation is that it indicates the need to be cognisant of the nature and context of the stimuli under consideration. In the main the context is the social and concerns the impressions people form about others by relating aspects of appearance or behaviour to one or more constructs in the interpersonal cognitive system (Crockett 1965, p. 48).

Studies of Bieri's concept of cognitive complexity over an extended period 'have provided overwhelming support for its construct validity as a measure of the capacity to perceive social behavior in a multidimensional fashion' (Carraher & Buckley 1996, p. 103). In the current research the logic underlying cognitive complexity, which is that of construct relatedness, was employed in a model that was developed to yield a new measure of cognitive complexity.

### **The Content of Cognitive Structures**

The foregoing has focussed on cognitive complexity as a measure of form and reflects the primary thrust of analytical methods that have been applied to repertory grids.

However the analysis of content in grids, which it has been argued is also a component of cognitive structure has not been elucidated properly in the personal construct literature. Most accounts are of form with little or no mention of content.

For example whilst the works by Bieri's (1955), Bannister (1960, 1962) and Crockett (1965) addressed form, none of them related to content per se. In works where content measures are mentioned they are poorly elaborated. For example, Bannister and Mair (1968, p. 68) correctly defined structure as the mathematical characteristics of a construct system and content as about the meaning of constructs. However, whilst arguing that one should not divorce these two aspects of analysis from one another there is no further discussion in the text of methods for analysing content. Slater's (1977) work was also about form, as was that by Fransella and Bannister (1977). No mention was made of content. Landfield (1971) was the first to employ a scheme to categorise constructs. Lifshitz (1974) classified the constructs of social work trainees and their supervisors according to whether they were concrete or abstract. She found that trainees used more concrete constructs whilst supervisors employed more abstract constructs (Fransella & Bannister 1977, p. 21).

Reger (1990) spoke about the analysis of content in repertory grids but appeared to have confused measures of form with measures of content. Reger (1990, p. 305) said that:

Within personal construct theory the content of constructive systems has been narrowly described in three ways: element distance, construct centrality, and element preference ... These three content descriptions were first proposed by Kelly (1955) and widely reviewed in the personal construct literature.

According to Reger (1990):

Element distance refers to the multidimensional distance among elements and measures perceived similarity among elements. Those elements rated similarly on all dimensions are perceived to be similar and those rated differently on all dimensions are perceived to be different (Reger 1990, p. 305).

This definition of element distance is acceptable but it is not a measure of content. Rather it is a measure of form and alludes to multidimensional scaling as a method of analysis.

As discussed by Reger (1990) construct centrality also appeared to be more about form than content. Reger (1990, pp. 305–6) said:

Construct centrality refers to the importance of a construct in relation to all other constructs. Kelly (1955) theorized that constructs such as good versus evil and love versus hate might be central in all individuals' constructive systems. Constructs with high centrality are those which are highly correlated with all other constructs. These correlations can be studied directly from a correlation matrix or indirectly from the output of a factor analysis.

Again the allusion is to content by reference to the constructs of *good – evil* and *love – hate*. However, this extract with its reference to construct centrality as indicated by correlation matrices and factor analysis is primarily about form. Reger (1990) could have elaborated on the semantic elements in the constructs of good versus evil and love versus hate. A reading of the object relations literature demonstrates that these fundamental constructs are the basis for the development of an adult identity. In object relations theory:

Splitting is the term used to portray the way in which the child deals with an inconsistent and ungratifying mother. For the most part the mother is experienced as good. She fulfils the child's need and gratifies his wishes. But there are circumstances under which the mother is also experienced as bad. She ignores the child, rejects his advances and frustrates his desires ... Fairbairn proposes that the child addresses this dilemma by constructing an inner world inhabited by different aspects of the mother. This constitutes the earliest form of splitting ... The result is an inner world that is split 'to "good" and "bad" internal objects (Cashdan 1988, p. 10).

Reger's (1990) mention of the 'qualitative classification of dimensions based on their content' (Reger 1990, p. 306) is the appropriate way to depict content analysis. Whilst Reger (1990) aligned this with the work in cognitive classification theories, she failed to

mention the method for the content analysis of repertory grids devised by Landfield and Epting (1987), which was surprising given the prominence of these people in the field of PCP. They devised a method for the content analysis of repertory grids. The content analysis performed on grids elicited as part of the current research draws on the work of Landfield and Epting (1987).

### Conclusion

In section one of this chapter it was argued there was considerable depth in Kelly's work. However, it reflected earlier developments that were not explicitly acknowledged by him. Thus, an effort was made not only to critique but also to retrospectively integrate his work with that of other significant contributors.

Kelly's philosophy was less problematic since he made it explicit as *constructive alternativism*. As has been shown this can be depicted as nominalist and anti-positivist, and credits the individual with agency. The methodological direction that flows from the conjunction of these assumptions is *idiographic*.

In section three it was shown that after evaluating three idiographic methods a decision was made to use the repertory grid as an investigative tool. This decision was made in the knowledge that considerable work would be required to configure a design for the grids that could ultimately be used for the research. It was also accepted that learning to elicit grids would be an experiential process.

In section four cognitive structure was defined as comprising form and content. The form is the relationship between constructs and the content is their semantic properties.

This definition is wider than that which has been employed in much of the PCP work. It is the one employed in this thesis.

However, an analysis of Kelly's theory and a review of the literature revealed there was a substantive issue which had not been satisfactorily resolved by Kelly, his contemporaries or subsequent researchers. The issue concerns the nature of personal constructs. Work on this issue has led to an alternative conceptualisation of constructs as *fuzzy subsets* and is the thrust of the next chapter. In concert with this it has been necessary to devise a new method for the analysis of grid data. This is presented in chapter 4 and concludes the first part of this thesis.

## CHAPTER 3

### REPRESENTING PERSONAL CONSTRUCTS AS FUZZY SUBSETS

#### Introduction

Although Kelly (1955, p.141) acknowledged the difference between *dichotomy* and *bipolarity*, he did not distinguish clearly between them. In his discussion about the nature of personal constructs he appeared to use these terms interchangeably (Kelly 1955, p.106). Moreover in the first published review of research stimulated by Kelly's work, only a passing remark that 'bipolarity does not necessarily imply dichotomy' was made (Bonarius 1965, p. 27). Similarly, Riemann (1996, p. 70) wrote that 'obviously there is a difference between the notion of dichotomy and the notion of bipolarity' but choose to meld the concepts for the purposes of the discussion in his paper. Although bipolarity and dichotomy they are be related to one another each is a distinct concept. Bipolarity describes the nature of a construct as a *two-ended* thing. Dichotomy is a way in which a construct may be applied in an all or nothing manner; that is, dichotomy is observed when a person construes an element as belonging to one or the other pole of a construct, and not to some intermediate position. It will be demonstrated by argument and by the data presented in this thesis that dichotomous construing occurs but that it is not typical of the manner in which people generally apply their personal constructs.

Of the two concepts bipolarity is more important since it is central to Kelly's theory. Kelly (1955, pp. 106-8) cited a study by Lyle (1953) in support of his proposition that personal



constructs are bipolar in form. Lyle (1953) reported that errors made by subjects in assigning words to one category coincided with errors in assigning words to that category which was opposite to it. For example when subjects erroneously allocated words to the category *cheerful* they made similar errors in assigning words to the category *sad*. Resnick and Landfield (1961, p. 55) also reported that there was considerable overlap between the poles of personal constructs particularly those which were *logical (mature – immature)* as opposed to *peculiar (sense-of-humor – outgoing)*. Kelly's assumption of bipolarity is sound. However dichotomy ought to be distinguished since it is but one method of applying constructs to elements. The bipolarity of constructs is respected and the notion of dichotomy accommodated by treating personal constructs as *fuzzy subsets*. This opens the way for a more liberal but also rigorous application of Kelly's work. This chapter sets out the rationale for this.

The chapter is presented in three sections. It begins by stating six assumptions. The first pertains to the mathematical form of the repertory grid whilst the second, third and fourth were made by Kelly (1955) when formulating his theory. The fifth and sixth assumptions are a basis for situating personal constructs within the theoretical framework of classical set theory. Using these assumptions section one portrays personal constructs as classical sets. The section demonstrates how the basic rules of complementation and intersection can be applied to analyze them and the relationships between them.

Section 2 shows that *Fuzzy Set Theory* as described by Zadeh (1965) can be used to represent personal constructs in a more realistic manner. The defining characteristic of a fuzzy set is that membership values can range from zero to one representing graded membership from non-membership to full membership respectively. Section 2 also

introduces new procedures for the elicitation and rating of constructs, which alleviate problems, that can occur because of the irrelevance or illogicality of construct poles.

In the current research these problems were often found to be an artifact of the process of elicitation. The procedures are integral to the representation and analysis of personal constructs as fuzzy subsets. The operations of complementation and intersection are revisited in section 2 except that the application is to *fuzzy* not classical sets.

Section 3 presents the *Decomposition Theorem* and demonstrates the related principle of *Inclusion*. It is shown that when constructs are represented as fuzzy subsets they can be decomposed into ordinary sets and that by applying the principle of inclusion the relatedness or similarity of constructs can be assessed. Thus, a basis for the analysis of the form in a underlying cognitive structure is established. This thinking can also be applied to elements in a repertory grid such that their relatedness or similarity can be assessed.

### **Personal Constructs as Classical Sets**

The representation of personal constructs as fuzzy subsets is better understood against the background of set theory. Therefore, prior to introducing this representation of them, a discussion in terms of classical set theory is presented.

To begin six assumptions have been made. The sequential numbering does not indicate that one assumption is more important than another. This style has been adopted for convenience when referring to them at other points in the thesis.

1. A repertory grid is a matrix of dimension  $m \times n$  where  $m$  refers to the rows and  $n$  refers to the columns. The rows represent the constructs and the columns represent the elements. The elements are assumed to represent the universe of discourse (Zadeh 1971, p.162). The term universe of discourse and not universal set is used here since strictly speaking the latter is defined as comprising all of the elements under consideration. The elicitation of constructs relies on the use of triads of elements that have either been supplied by the researcher or nominated by the participant. These elements do not usually constitute a universal set but rather a representative set or universe of discourse.
2. Personal constructs are bipolar dimensions comprising an emergent (left) pole and an implicit (right) pole. Often a person may have no explicit symbol for the implicit pole. The emergent pole symbolises it only implicitly (Bannister & Mair 1968, p. 220).
3. The poles of a construct are opposites. They may be apposite (logical) such as good – bad but they need not be so. In general the implicit pole is best understood as a contrast. This accommodates constructs that are apposite in form and those which are not.
4. Constructs are dichotomous such that elements are located on one or other of the construct poles not in any intermediate position. Elements which congregate on one pole are said to be like elements and different from those which congregate on the opposite pole (Bannister & Mair 1968, p. 220).
5. Since constructs are assumed to be dichotomous they comprise two mutually exclusive subsets of elements, one which relates to the emergent pole and the other which relates to the implicit pole.
6. There is a complementary relationship between the subsets in the terms of the universe of discourse. The subset that relates to the implicit pole will be called the complementary subset.

The arguments and equations presented below follow the logic and conventions of classical set theory as presented by Kaufmann (1975, p. 3). However, the presentation

here relates that theoretical material to personal construct psychology. Thus, specific notation has been developed to indicate this.

Let  $E$  be a set of  $n$  elements:

$$E = \{e_1, e_2, \dots, e_n\} \quad (3.1)$$

$E$  is the reference set and is not fuzzy such that every element  $e_j$ ,  $0 < j \leq n$  has full membership of  $E$ . Thus  $E = \{1, 1, \dots, 1\}$ . The elements can be used to elicit constructs.

$C_i$ ,  $0 < i \leq m$  that are *construct subsets* of  $E$ . This may be written as  $C_i \subset E$ ,  $0 < i \leq m$ .

The notation  $\subset$  is used instead of  $\subseteq$  to indicate that the  $C_i$  are not constrained to be equal to  $E$ . Rather the  $C_i$  may contain all, some or none of the elements in  $E$ . In the latter case  $C_i = \emptyset$ , the null set. Since the null set is a subset of every set no inconsistency arises. Thus,  $C_i$  the construct subsets satisfy the specification criteria for a subset in that every member of  $C_i$  is also a member of  $E$  (Devlin 1993, p. 3). The construct subsets are named according to the label that describes the explicit pole of a particular construct. Thus, if a construct is *happy – sad* the explicit pole *happy* is used as the name for the construct subset.

Membership of the elements  $e_j$  in the  $C_i$  can be indicated by employing a characteristic function  $\mu_{C_i}(e_j)$ , whose value depends on whether or not  $e_j$  is a member of the subset  $C_i$  namely,

$$\mu_{C_i}(e_j) = 1 \quad \text{if} \quad e_j \in C_i \quad (3.2)$$

$$\mu_{C_i}(e_j) = 0 \quad \text{if} \quad e_j \notin C_i \quad (3.3)$$

Thus, the construct subsets can be written

$$C_i = \{e_j\} \quad (3.4)$$

## Construing Politicians

For the purpose of exposition, an example of a grid elicitation is outlined below. A person was asked to name eight Australian politicians from State or Federal politics as elements for the grid. By triadic elicitation eight constructs were generated concerning the politicians. For simplicity, and without affecting the generality of what follows, only four politicians and four constructs will be considered.

The four constructs are:

*arrogant – reserved*  
*shrewd – outspoken*  
*rude in public – tactful in public*  
*capitalist focus – people focus*

It may be seen that none of these constructs are apposite in form. However, the participant had no difficulty in verbalising what these constructs meant to her. The emergent poles of the constructs will be used to label the construct subsets  $C_i$  as follows:

$C_1$	=	arrogant
$C_2$	=	shrewd
$C_3$	=	rude in public
$C_4$	=	capitalist focus

The participant was asked to indicate whether or not she thought each of the politicians were members or not of the construct subsets as described by the emergent pole of each construct. An example of an elicitation sequence is:

*Think about politicians  $e_1, e_2, e_3$  and  $e_4$  in relation to the adjectives Arrogant and Shrewd shown in the table below. If you think that an adjective describes a politician then place the number 1 in the box, which corresponds with that politician's name and the adjective. Otherwise, place the number 0 in the appropriate box. Do this for each of the politicians.*

The partial grid below shows the rating responses.

Table 3.1: Partial Grid for Four Politicians

Constructs/Elements	$e_1$	$e_2$	$e_3$	$e_4$	
$C_1$ : Arrogant	1	0	1	0	Reserved
$C_2$ : Shrewd	1	1	0	1	Outspoken

This rating scheme can be described in terms of the complementary rule which emanates from the 'well-known properties of Boolean binary algebra' (Kaufmann 1975, p. 2). This is shown below.

### Complementation

Let  $C'_i$  be the complement of  $C_i$  with respect to  $E$ :

If  $e_j \in C_i$  then  $e_j \notin C'_i$  and one writes  $\mu_{C_i}(e_j) = 1$  and  $\mu_{C'_i}(e_j) = 0$  (3.5)

Thus  $C_i \cap C'_i = \emptyset$  (3.6)

It also follows that  $C_i \cup C'_i = E$  (3.7)

Equation (3.5) indicates that the subsets related to each construct pole are independent such that an element can be a member of one or the other subset but not to both at the same time. Thus as shown in equation (3.6) the intersection of the subsets that are named according to the poles of the constructs is a null set. Equation (3.7) states that, every element in the universe of discourse, is specified by the union of a construct subset  $C_i$  and its complement  $C'_i$ .

### Example 1

The subset  $C_1$  (Arrogant) is:

$$C_1 = \{1, 0, 1, 0\} \quad (3.8)$$

By Assumptions 4 and 6 and by applying (3.5) the complementary subset  $C'_1$  (Reserved) is:

$$C'_1 = \{0, 1, 0, 1\} \quad (3.9)$$

Thus equation (3.5) portrays Kelly's Dichotomy Corollary. However Kelly's elaboration on this corollary did not suggest that he had made the parallel connection between his specification and set theory. Rather he indicated that binary coding rendered data amenable to analysis on 'electronic computing machines' (Kelly 1955, p. 64). Thus one interpretation is that the dichotomy corollary was a convenience which allowed automated analysis of grid data to take place. Moreover, the analytical method which he proposed, was a non-parametric factor analysis based on 'matching the incidents and voids' between pairs of rows in a repertory grid. The significance of matching scores was determined by relating them to a table of p-values based on the binomial probability of obtaining any number of matchings by chance (Kelly 1955, pp. 280-1). Thus, there was a rationale for his method but it was predicated on the assumption that in general the 'psychological system is itself a dichotomized system' (Kelly 1955, p. 290). Moreover, the remark by Bonarius (1965) challenged the implicit assumption of the Dichotomy Corollary, which is that an element can always be related to one or the other pole of a construct. He also argued that if the binary form of the grid was rejected then non-parametric factor analysis would be difficult if not impossible. It will be shown subsequently that the constraints imposed by the universal adherence to Kelly's

dichotomy corollary can be relaxed by the alternative specification of personal constructs as fuzzy subsets.

### Intersection

Using another axiom from set theory questions may be answered such as: *Which politicians are both Arrogant and Shrewd?* That is which elements comprise the subset

$$C_1 \cap C_2.$$

Let  $C_i$  and  $C_k$  be two subsets of  $E$  with respect to constructs  $i$  and  $k$ . For  $0 < i < m$  and  $i < k \leq m$ :

$$\mu_{C_i}(e_j) = 1 \text{ if } e_j \in C_i \quad (3.10)$$

$$\mu_{C_i}(e_j) = 0 \text{ if } e_j \notin C_i \quad (3.11)$$

$$\mu_{C_k}(e_j) = 1 \text{ if } e_j \in C_k \quad (3.12)$$

$$\mu_{C_k}(e_j) = 0 \text{ if } e_j \notin C_k \quad (3.13)$$

$$\mu_{C_i}(e_j) \cap \mu_{C_k}(e_j) = 1 \text{ if } e_j \in C_i \cap C_k \quad (3.14)$$

$$\mu_{C_i}(e_j) \cap \mu_{C_k}(e_j) = 0 \text{ if } e_j \notin C_i \cap C_k \quad (3.15)$$

$$\text{In general, } C_i \cap C_k = \mu_{C_i}(e_j) \cdot \mu_{C_k}(e_j) \quad (3.16)$$

In (3.16)  $\cdot$  indicates the Boolean product.

### Example 2

Consider the construct subsets  $C_1$  (Arrogant) and  $C_2$  (Shrewd).

Using (3.16) the intersection of these construct subsets

$$C_1 = \{1, 0, 1, 0\} \quad (3.17)$$

and



$$C_2 = \{1, 1, 0, 1\} \quad (3.18)$$

is

$$C_1 \cap C_2 = \{1, 0, 0, 0\} \quad (3.19)$$

This means that only politician  $e_1$  was construed as both arrogant and shrewd.

### Using Intersection to Measure Cognitive Complexity

A measure of cognitive complexity can be derived by applying (3.16) to every pair of constructs in a repertory grid. If a grid contains  $m$  constructs (rows) then a matrix  $A$

can be derived which will have  $c = \frac{m!}{x!(m-x)!}$  combinations of rows, where  $x = 2$ , a pair

of rows. For example, if a grid  $G$  has four rows then the number of combinations of rows

$c$  is  $\frac{4!}{2!(4-2)!} = 6$ . These are  $g_{1,2}$ ,  $g_{1,3}$ ,  $g_{1,4}$ ,  $g_{2,3}$ ,  $g_{2,4}$  and  $g_{3,4}$ . Combinations, not

permutations are listed here since order is of no consequence (Hamburg 1983, pp. 84–5).

### Example 3

Consider the hypothetical grid  $G$  shown below.

Table 3.2: Hypothetical Grid for Four Politicians

Constructs/Elements	$e_1$	$e_2$	$e_3$	$e_4$	
$C_1$ : Arrogant	1	0	1	0	Reserved
$C_2$ : Shrewd	1	1	0	1	Outspoken
$C_3$ : Rude in public	1	1	1	1	Tactful in public
$C_4$ : Capitalist Focus	1	0	1	0	People Focus

Using (3.16) a matrix  $A_1$  which shows the agreement of the rows in the original grid was generated. This is shown as Table 3.3 below.

Table 3.3: Agreement Matrix for Hypothetical Grid

Row Pairs	$e_1$	$e_2$	$e_3$	$e_4$
Rows $g_{1,2}$	1	0	0	0
Rows $g_{1,3}$	1	0	1	0
Rows $g_{1,4}$	1	0	1	0
Rows $g_{2,3}$	1	1	0	1
Rows $g_{2,4}$	1	0	0	0
Rows $g_{3,4}$	1	0	1	0

It may be seen that in Table 3.2 there is no pair of rows in which unit entries were observed in every cell. Thus, in Table 3.3 there is no row that comprises unit entries in every cell.

Using the results in Table 3.3 a cognitive complexity index  $CC$  can be calculated that has values, which range on  $[0,1]$ . When the index value is one all of the cells in a grid have unit entries in them. When the index value is zero, there are no unit entries in corresponding cell addresses. However, this does not necessarily mean that in the original grid there are no unit entries.

The index can be calculated as follows:

$$CC = \frac{\sum a_{ij}}{m \times n}, 0 < i \leq m, 0 < j \leq n \quad (3.20)$$

In (3.20)  $m$  and  $n$  are the number of rows and columns in  $A$  respectively. For this example the value of the index is  $11/24 = 0.46$ . This index resembles the measure of cognitive complexity/simplicity developed by Bieri (1955) and the *intensity* measure developed by Bannister (1960, 1962). Bieri's measure was based on the

correspondence of entries (checks and voids) between the pairs of rows in a grid. Under his criteria two rows were assumed to match only if 'a construct check pattern was repeated' (Bieri 1955, p. 264). Thus, in a grid with four columns a pattern such as  $[1,1,1,1], [1,1,1,1]$  across two rows would be a match as would  $[1,0,1,0], [1,0,1,0]$ . However Bieri (1955) did recognise a partial match if all but one pair of cells in a pair of rows were identical. By extension it is assumed that a pattern such as  $[0,0,0,0], [0,0,0,0]$  was also a match. Thus, under Bieri's scheme a grid filled with zero entries would achieve the same cognitive complexity score as that for a grid in which all of the cells were filled with unit entries. In contrast Bannister (1960, 1962) recognised matches on a cell by cell basis such that two cells in corresponding rows were deemed to be matched if they contained either  $[1,1]$  or  $[0,0]$ .

It may be seen that in terms of Bieri's criteria rows one and four in Table 3.2 are a match. A matrix,  $A_2$ , which represents this logic is shown as Table 3.4 below.

Table 3.4: Agreement Matrix using Bieri's Criteria

Row Pairs	$e_1$	$e_2$	$e_3$	$e_4$
Rows $g_{1,2}$	0	0	0	0
Rows $g_{1,3}$	0	0	0	0
Rows $g_{1,4}$	1	1	1	1
Rows $g_{2,3}$	1	1	0	1
Rows $g_{2,4}$	0	0	0	0
Rows $g_{3,4}$	0	0	0	0

This table recognises the correspondence of rows one and four in Table 3.2 in terms of checks and voids. In Table 3.2 all but one pair of corresponding entries in rows two and three were matched. Thus, in Table 3.4 a partial match was recognised by placing unit entries in corresponding cells in row four. Since the pattern of entries in Table 3.4 is

different to that in Table 3.3 a revised cognitive complexity measure was calculated. By using (3.20) the revised CC index is  $7/24 = 0.29$ . Since this coefficient is smaller than that which was first calculated the suggestion is that the underlying cognitive system is more differentiated than was indicated by the first coefficient whose value was 0.46. If Bannister's matching criteria are applied to the grid in Table 3.2 the agreement matrix would be as shown in Table 3.5 below.

**Table 3.5: Agreement Matrix using Bannister's Criteria**

Row Pairs	$e_1$	$e_2$	$e_3$	$e_4$
Rows $g_{1,2}$	1	0	0	0
Rows $g_{1,3}$	1	0	1	0
Rows $g_{1,4}$	1	1	1	1
Rows $g_{2,3}$	1	1	0	1
Rows $g_{2,4}$	1	0	0	0
Rows $g_{3,4}$	1	0	1	0

It may be seen that in this table there are more unit entries than in Table 3.4. This reflects the less conservative matching criteria of Bannister (1960, 1962). Again using (3.20) the CC index is  $13/24 = 0.54$ .

Overall in terms of matching criteria the complexity measure as derived here and presented in (3.20) is less conservative than that proposed by Bieri (1955) but more conservative than that proposed by Bannister (1960, 1962). Unlike Bieri, unanimity or near unanimity between rows is not required. In (3.16) the commonality between constructs is determined using the intersection rules specified in (3.14) and (3.15). Thus, like Bannister (1960, 1962) (3.14) deems a match (intersection) if two corresponding cells in a pair of rows have unit entries. Unlike Bieri (1955) and Bannister (1960, 1962) (3.15) deems no match (no intersection) when zero entries occur in corresponding cells across two rows. The reason for this difference is that in the current

research interest is focused on membership values of subsets described by the explicit poles of constructs. A zero entry indicates that an element is not a member of such a set. Two zero entries in corresponding positions indicate no commonality between two constructs in terms of that element. It will be shown that the relationship between the constructs in a grid can be measured by deriving a coefficient based only on the ratings as related to the explicit pole of each construct.

### **Reversing Constructs**

In a grid a predominance of voids may indicate that it is appropriate to reverse the constructs. Moreover, Gaines and Shaw (1981) observed that the assignment of the left-hand and right-hand pole to a construct is artificial. They proposed that:

Unless some special additional rationale is in operation then what are called the left-hand and right-hand poles of a construct may be reversed without distorting the grid provided the assignment of elements to those poles is also reversed (Gaines & Shaw 1981, p. 154).

Thus irrespective of the ratings pattern it may be appropriate to reverse one or more constructs in a grid. Reversing constructs may make the interpretation of a grid more meaningful. Kelly (1955, p. 283) also noted that there may be a need to reverse constructs and used the term *reflection* to describe the process.

### **Problems Created by Kelly's Dichotomy Corollary**

Kelly (1955) was not the first to observe that there can be no 'similarity without contrast' (Kelly 1955, p. 51). The Pythagoreans used a table of ten opposites such as *limited* – *unlimited* and *good* – *evil* to analyse entities (Gaines and Shaw 1981, p. 171). Mao Tsetung (1937) argued that an aspect without its opposite loses the condition for existence. He also noted that the very contradiction of opposites generates identity (Mao Tsetung 1937, p. 61, quoted in Gaines and Shaw 1981, p. 171). Similarly Brown (1969) wrote that 'a universe comes into being when a space is severed or taken apart'

(Brown 1969, p. 2, quoted in Shaw and Gaines, 1984, p. 339). However, a difficulty created, by dichotomous rating is that an inverse relation between construct poles is generated such that the predicate corresponding to one pole behaves as the logical negation of that corresponding to the other. Whilst opposition is related to negation it is not identical to it (Gaines & Shaw 1981, p. 171).

It appears that there was an inherent contradiction in Kelly's work. On the one hand he maintained that the integrity of meaning is maintained by the representation of constructs as bipolar abstractions of similarity and contrast. On the other hand by forcing construing to be dichotomous three problems were created.

1. Firstly, the Boolean interpretation of disjunction eliminated 'binding oppositionality as a fundamental characteristic of meaning' (Rychlak 1991, p. 246).
2. Secondly, ratings would reflect rigid thinking, which should be a clinical manifestation (Jones 1961, p. 276), not a pattern that is artificially created.
3. Finally, the distinction between *not* and *not relevant* was obscured by the negation implicit in dichotomy. Kelly (1955) recognised this problem indicating that a void in a cell of a grid may be indicative of irrelevance rather than negation of the explicit pole (Gaines & Shaw 1981, p. 173).

Thus although an election was made to employ the repertory grid in the current research, the problems mentioned above required resolution. It was intended that any methodological innovation would maintain the integrity of Kelly's theory with respect to the bipolarity of constructs, allow for shades of grey as well as dichotomous construing,

and resolve the problem of relevance. The theory of *fuzzy sets* (Zadeh, 1965) emerged as an attractive and viable extension of the binary valued logic of set theory. It proved to be invaluable in addressing the problems mentioned above. A detailed discussion of this methodological initiative is presented in the next section.

### Personal Constructs as Fuzzy Subsets

Zadeh conceptualised a *fuzzy set* as a generalisation of a classical set. Whilst he introduced the term *fuzzy* in 1962 (Gaines, Zadeh & Zimmerman 1984, p. 3) the paper which marks the beginning of the serious interest in fuzzy sets was published by him in 1965. Therein, he introduced fuzzy sets with the preamble:

The "class of beautiful women" [*sic*] or "the class of tall men", do not constitute classes or sets in the usual mathematical sense of these terms. Yet, the fact remains that such imprecisely defined "classes" play an important role in human thinking, particularly in the domains of pattern recognition, communication of information, and abstraction (Zadeh 1965, p. 338).

Zadeh (1973) spoke further of the limitation of traditional mathematics in the study of human thought and behaviour as the following indicates:

At present, most of the techniques employed for the analysis of *humanistic*, i.e., human centered, systems are adaptations of the methods that have been developed over a long period of time for dealing with *mechanistic* systems, i.e., physical systems governed in the main by the laws of mechanics, electromagnetism, and thermodynamics. The remarkable successes of these methods in unraveling the secrets of nature and enabling us to build better and better machines have inspired a widely held belief that the same or similar techniques can be applied with comparable effectiveness to the analysis of humanistic systems (Zadeh 1973, p. 28).

Thus, positivist research methodologies when articulated with traditional mathematics often reflect precision at the expense of relevance. Polkinghorne (1984) wrote:

When we ... impose a matrix of operationally closed sets over human experience, we often reproduce the "precision fallacy". The precision of the measuring instrument is more exact than precision of the experience. (Polkinghorne 1984, p. 425, quoted in Hesketh, Pryor, Gleitzman & Hesketh 1988, p. 427).

Perceptions are not generally dichotomous although in certain circumstances they may be. Thus, when a person holds a strong view their conviction may be exemplified by dichotomous construing. Jones (1961) observed that extreme polarisation such as in the perception of others as 'good guys and bad' renders dimensions of perception which permit useful discrimination inoperant. However as a finding polarised construing is significant and should not be overlooked (Jones 1961, p. 276). In this section it will be shown that fuzzy set theory is versatile. It embodies the notion of dichotomy as presented in classical set theory but it is not founded on this principle. Rather the membership values for fuzzy set are *graded* from zero to one such that intermediate membership values are also explicitly recognised.

### Fuzzy Sets Defined

Zadeh (1965) defined a set as fuzzy when the membership values for that set were not *crisp*, that is  $\{0, 1\}$  (zero or one) but could also take on intermediate values in the interval  $[0, 1]$  (Zadeh 1965, p. 339).

By fuzziness we mean a type of imprecision which is associated with *fuzzy sets*, that is classes where there is no sharp transition from membership to nonmembership. For example the class of *green objects* is a fuzzy set. So are the classes of objects characterized by commonly used adjectives as large, small, substantial, significant, important, serious, simple, accurate, approximate, etc. Actually in sharp contrast to the notion of a class in mathematics, most of the classes in the real world do not have boundaries which separate those objects which belong to the class from those which do not. In this connection, it is important to note that, in the discourse between humans, fuzzy statements such as "John is *several* inches taller than Jim," "x is *much larger* than y," "Corporation X has a *bright future*," "the stock market has suffered a *sharp decline*," convey information despite the imprecision of the meaning of the italicized words (Bellman & Zadeh 1970, pp. 141-42).



Bellman and Zadeh (1970) distinguished between randomness and fuzziness.

Essentially, randomness has to do with uncertainty concerning membership or nonmembership of an object in a nonfuzzy set. Fuzziness, on the other hand, has to do with classes in which there may be grades of membership intermediate between full membership and nonmembership. To illustrate the point the assertion "Corporation X has a modern outlook" is imprecise by virtue of the terms "modern outlook." On the other hand, the statement "The probability that Corporation X is operating at a loss is 0.8" is a measure of uncertainty concerning the membership of Corporation X in the nonfuzzy class of corporations which are operating at a loss (Bellman & Zadeh 1970, p. 142).

According to Smithson (1987)

A *subset* is fuzzy when an element can belong partly to it rather than having to belong completely or not at all. Fuzzy set theory, therefore begins with the assignment of membership values to elements which are not restricted to  $\{0,1\}$  but which may lie somewhere in the interval  $[0,1]$  (Smithson 1987, p. 9).

Smithson (1987) did not distinguish between the universe of discourse, say the set  $E$ , which is not fuzzy and subsets of  $E$  which are. In the current research the distinction is important. The interest is not in the set  $E$  per-se but in subsets of  $E$  which are represented by the membership values of the elements in relation to each construct. So, without altering the meaning, the term *subset* has been substituted for the term *set* which was used in the original. This follows Kaufmann (1975, p. 1) who drew the distinction between the reference set or universe of discourse  $E$  which is not fuzzy and subsets of  $E$  which are.

### **Bipolarity and Dichotomy are Different**

Constructs are bipolar in form because they have two poles. The poles may be apposite (logical) such as *good* – *bad* or inapposite (peculiar) such as *intelligent* – *bad* (Resnick & Landfield 1961, p. 49). Constructs are dichotomous or *crisp* when a person locates an element on one or other of the poles and not in some intermediate position along the continuum. Thus, in relation to the form of constructs and the rating schemes employed with them four cases are proposed. These are detailed in Table 3.6.

Table 3.6: Construct Types and Rating Schemes

Construct Type/Rating Scheme	Dichotomous (Classical)	Fuzzy
Bipolar Apposite (logical)	Arrogant – Modest	Arrogant – Modest
Bipolar Inapposite (peculiar)	Arrogant – Reserved	Arrogant – Reserved

In terms of construct types this table reflects assumptions two and three which together imply that constructs are bipolar dimensions of contrast. However, Riemann (1990, pp. 159-60) argued that bipolarity is an important but not universal aspect of personal constructs and suggested that some constructs may be *multipolar*. For example in a triadic elicitation involving persons A, B and C, A and B could be construed as *warm* and C could be construed as *cold*. This is an apposite construct. However, suppose that there is another person D who is construed in a triad also involving persons A and B. A and B may again be construed as *warm* but person D as *submissive*. Whilst *submissive* is not apposite to *warm* this contrast may have considerable meaning for the participant in terms of contrasting D with A and B (Riemann 1990, p. 161). Moreover it would appear that the construct is multipolar. However, if *warm – cold* and *warm – submissive* are each viewed as separate entities, then the assumption of bipolarity can be maintained. Thus, in the current research the substance of assumptions two and three is retained.

Assumption 4 is that constructs are dichotomous. Millis and Neimeyer (1990) concluded that:

Whatever the underlying memory representation, our results do support a construct-based position that claims that constructs are indeed bipolar. However, we are not claiming that constructs need to be as bipolar as originally theorized by Kelly. Kelly assumed that constructs were strictly dichotomous with no room for "grayness." Our data do not directly address this strong position. We agree largely with claims that the assumption of dichotomy is too strict (Millis & Neimeyer 1990, p. 178).

Whilst endorsing the argument that 'the assumption of dichotomy is too strict' the distinction between bipolarity and dichotomy appears to have been confused here. This is evidenced by the phrase 'we are not claiming that constructs need to be as bipolar as originally theorised by Kelly'. Again bipolarity is about the form of constructs as having two defined poles, which stand in contrast to each other. There is no such thing as degrees of bipolarity as was implied by (Millis and Neimeyer, 1990). A construct is bipolar or it is not. Dichotomy is a way one might rate an element against a construct and as such it is a measure of degree.

Rychlak (1991) argued that what Kelly meant by dichotomy was not that an element is either X or Y but that it can be both X and Y at the same time. 'There is always an XY tie of opposition *uniting* the duality of meaning in a construct'. However, it is the bipolar form of constructs not dichotomy, which creates the 'tie of opposition *uniting* the duality of meaning'. Whilst dichotomous rating illuminates the contrasting poles of a construct, dichotomy is just one of the ways in which one can rate elements against a construct. A better expression of Kelly's Dichotomy Corollary may be:

A Person's Construction system is composed of a finite number of *bipolar* constructs. These constructs may be used in a dichotomous manner or as continua.

It would also clarify Kelly's arguments if the term *bipolar* were substituted for *dichotomy* in Kelly's original work (Kelly 1955, pp. 106-7). The assumption that construing is dichotomous is too constraining. Whilst it applies to computers which work on Boolean mathematical logic it does not accord with human thinking (Rychlak 1991, p. 245). Consequently assumption four will be relaxed to allow for fuzzy ratings.

## Altering Practice

As a matter of practice grid elicitation methods should not force participants to rate elements in a dichotomous manner or against what may be for them unnatural construct poles. To achieve this two new procedures are recommended. They can be used with the triadic or similar elicitation methods.

**Procedure 1.** When an elicited construct is obviously apposite a participant should be asked to rate the elements on the interval  $[0,1]$  with respect to the emergent pole. For example, if an elicited construct is *strong – weak* a participant should be asked to rate the elements with respect to strong, where 1 indicates full membership of the *fuzzy construct subset* strong and 0 indicates full membership of the complementary fuzzy construct subset weak. This procedure permits dichotomous as well as fuzzy ratings. In practice it may prove easier to ask a participant to think of the explicit pole as representing 0 and the implicit pole as representing 1 and subsequently reverse the rating prior to analysis. This was what transpired in the current research.

The term *fuzzy construct subset* is new and reflects the compatibility of Kelly's work with that of Zadeh's. Support for its formulation and the meaning behind it was found in Zadeh (1971, pp. 162–5) as the following indicates:

Informally the "universe of discourse" is a collection of objects,  $U$ , that is rich enough to make it possible to identify any concept, within a specified set of concepts, with a fuzzy subset of  $U$ . ... Consider two spaces: (a) a universe of discourse,  $U$ , and (b) a set of terms,  $T$ , which can play the roles of names of fuzzy subsets of  $U$ . Let the generic elements of  $T$  and  $U$  be denoted by  $x$  and  $y$ , respectively. Our definition of meaning may be stated as follows.

*Definition 5.* Let  $x$  be a term in  $T$ . Then the *meaning* of  $x$ , denoted by  $M(x)$ , is a fuzzy subset of  $U$  characterized by a membership function  $\mu(y|x)$  which is conditioned on  $x$ . (It is understood, of course, that, as a special case, that  $M(x)$  may be non-fuzzy.)  $\mu(y|x)$  may be specified in various ways, e.g., by a table, or by a formulae, or by an algorithm, or by exemplification, or in terms of other membership functions.

*Example 6.* Let  $U$  be the universe of objects, which we can see. Let  $T$  be the set of term's *white, gray, green, blue, yellow, red, black*. Then each of these terms, e.g., *red*, may be regarded as a name for a fuzzy subset of elements of  $U$  which are red in color. Thus, the meaning of, *red*,  $M(\text{red})$ , is a specified fuzzy subset of  $U$ .

This thinking can be applied directly to repertory grids. The set  $E$ , whose members are the elements  $e_j$ , is analogous to  $U$  whose elements are  $y$ . The constructs used to describe the  $e_j$  parallel  $x$  which are the elements of  $T$ .

For example, suppose a person is asked to name eight people with whom they work. They serve as a universe of discourse from which constructs can be elicited. One such

construct might be *manager type – non-managerial*. The emergent pole of the construct *manager type* can be used as the name for a *fuzzy construct subset* which indicates how the people are viewed in terms of that construct. Thus, the meaning of *Manager Type, M (manager type)* is a specified fuzzy construct subset  $\tilde{C}_i$  of  $E$ . (The tilda ( $\sim$ ) notation is used to differentiate subsets which are fuzzy from ordinary sets).

**Procedure 2.** If an elicited construct appears to be nonsensical a participant should be asked to indicate whether the construct is a meaningful dimension for him/her. If the answer to this question is "yes" then the construct should be rated as in Procedure 1. If the answer is "no" then the elements should be rated on  $[0,1]$  with respect to each of the elicited poles. That is each pole is treated as a fuzzy construct subset. For example a person might verbalise a construct such as *arrogant – reserved* which is not apposite in the strict sense. However, the participant may be happy to treat it as such. In this case elements should be rated against the emergent pole *arrogant* on the understanding that the contrast is *reserved*.

If the participant indicated difficulty in construing *arrogant* and *reserved* on the same dimension both poles should be treated as a separate (not a complementary) fuzzy construct subsets. In such a case the contrasting pole should be elicited. However, Kelly noted that 'construing is not to be confounded with verbal formulation' (Kelly 1955, pp. 50–1) and that 'often people express their constructs incompletely' (Kelly 1955, p. 111). Thus in some circumstances the implicit pole may be difficult to elicit in verbal form.

These new procedures reflect the methodological direction advocated by Gaines and Shaw (1981). They accommodate the four cases as set out in Table 3.6. They

recognise the existence of constructs that are bipolar and apposite in form as well as those which are bipolar but not apposite. They permit the use of fuzzy and dichotomous ratings. Furthermore they allow constructs to be split and rated separately when the problem of irrelevance arises as it can do as an artifact of the elicitation process.

An equation for representing constructs as *fuzzy subsets* is shown below.

Let  $E$  be a finite set of elements and let  $e_j$  be an element of  $E$ . A *fuzzy construct subset*  $\tilde{C}_i$  of  $E$  is a set of ordered pairs:

$$\tilde{C}_i = \left\{ \left( e_j, \mu_{\tilde{C}_i}(e_j) \right) \right\}, \forall e_j \in E, 0 < i \leq m, 0 < j \leq n \quad (3.21)$$

$\mu_{\tilde{C}_i}(e_j)$  is a membership characteristic function, which takes its values in the totally ordered set  $M = [0, 1]$  and indicates the degree of membership of  $e_j$  in  $\tilde{C}_i$ . If  $M = \{0, 1\}$  then the fuzzy construct subset is understood to be a *non-fuzzy construct subset* or *ordinary construct subset*  $C_i$ .

(From this point the index ranges  $0 < i \leq m$ , and  $0 < j \leq n$  will be omitted. It will be understood then when  $e_j$  or  $\mu_{\tilde{C}_i}(e_j)$  is used the reference is to the elements of  $E$ ).

#### Example 4

Using (3.21) the fuzzy subset  $\tilde{C}_1$  (Arrogant) can be written as:

$$\tilde{C}_1 = \left\{ (e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 1.0) \right\} \quad (3.22)$$

Some relevant properties of fuzzy subsets are discussed below in the context of fuzzy construct subsets.

### Complementation

In terms of classical sets an element belongs either to a set or to its complement but not to both at the same time. However in fuzzy set theory it is possible for an element to have membership of two fuzzy subsets and for the relationship between those fuzzy subsets to be complementary (Kaufmann 1975, p. 10). Two fuzzy subsets are *mutually exclusive* only when they have dichotomous membership values such that they have the character of ordinary sets. Thus it is possible to give full recognition to the binding opposition between the poles of personal constructs by representing them as fuzzy subsets.

Let  $E$  be a set and  $M = [0,1]$  its associated membership set. The fuzzy construct subset  $\tilde{C}_i'$  is the complement of  $\tilde{C}_i$  if

$$\forall e_j \in E : \mu_{\tilde{C}_i'}(e_j) = 1 - \mu_{\tilde{C}_i}(e_j) \quad (3.23)$$

Equation (3.23) accommodates situations in which membership values for the fuzzy construct subsets are dichotomous as well as those situations in which they are fuzzy. In the case of the former (3.23) is an expression of the complementary rule as found in classical set theory and shown in (3.5).

### Example 5

Consider the fuzzy subset  $\tilde{C}_1$  (Arrogant)

$$\tilde{C}_1 = \{ (e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 1.0) \} \quad (3.24)$$



Using (3.23),

$$\tilde{C}_1' = \{(e_1, 0.6), (e_2, 1.0), (e_3, 0.4), (e_4, 0.0)\} \quad (3.25)$$

These are the membership values assigned to each politician in terms of the complementary fuzzy construct subset  $\tilde{C}'$  (Reserved).

### Intersection

The intersection of two fuzzy construct subsets can be defined as follows:

Let  $E$  be a set with an associated membership set  $M = [0, 1]$  and let  $\tilde{C}_i$  and  $\tilde{C}_k$  be two fuzzy construct subsets. The intersection  $\tilde{C}_i \cap \tilde{C}_k$  is the largest fuzzy subset contained at the same time in  $\tilde{C}_i$  and  $\tilde{C}_k$ . That is,

$$\begin{aligned} \forall e_j \in E : \mu_{\tilde{C}_i \cap \tilde{C}_k}(e_j) &= \text{MIN}(\mu_{\tilde{C}_i}(e_j), \mu_{\tilde{C}_k}(e_j)), \\ 0 < i < m, i < k \leq m \end{aligned} \quad (3.26)$$

### Example 6

Consider the fuzzy construct subset  $\tilde{C}_1$  (Arrogant)

$$\tilde{C}_1 = \{(e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 1.0)\} \quad (3.27)$$

Suppose that the fuzzy construct subset  $\tilde{C}_2$  (Shrewd) is

$$\tilde{C}_2 = \{(e_1, 0.7), (e_2, 0.4), (e_3, 0.8), (e_4, 0.8)\} \quad (3.28)$$

Then by using (3.26) the intersection of these two fuzzy construct subsets is

$$\tilde{C}_1 \cap \tilde{C}_2 = \{(e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 0.8)\} \quad (3.29)$$

$\tilde{C}_1 \cap \tilde{C}_2$  is the fuzzy subset of politicians who are construed as arrogant and shrewd. The membership values in this fuzzy subset reflect the degree of overlap for the corresponding elements in each of the fuzzy construct subsets  $\tilde{C}_1$  and  $\tilde{C}_2$ . It may be seen that for element  $e_1$  the degree of overlap is  $\text{MIN}(0.4, 0.7) = 0.4$ . Similarly and by using the MIN rule the degree of overlap in respect of element  $e_2$  the degree of overlap is  $\text{MIN}(0.0, 0.4) = 0.0$ .

Later in this chapter it will be shown that by using the principle of *inclusion* one fuzzy construct may be subsumed or included in another. This arises as a special case of intersection when *all* of the membership values in one fuzzy subset are less than or equal to the membership values in another. The principle of inclusion is a basis for determining the relatedness of constructs in a repertory grid and the relatedness of elements.

### Revising Assumptions

Given the alternative specification of personal constructs as fuzzy construct subsets, it is appropriate to revise assumptions four, five and six laid down at the beginning of this chapter. The revised assumptions are shown below. The notation *r* next to the numbers is to show that these are revised assumptions.

4(r). *Constructs comprise two fuzzy subsets, one that relates to the explicit pole and one which relates to the implicit pole. The fuzzy set related to the explicit pole will be called a fuzzy construct subset. Elements are rated on the interval [0, 1] such that dichotomous and fuzzy construing is accommodated.*

5(r). *In general the fuzzy subsets which comprise a construct are not mutually exclusive. However, this can occur when all ratings for a particular construct are dichotomous.*

6(r). *There may be a complementary relationship between the fuzzy subset related to the explicit pole of a construct and that related to the implicit pole.*

These revisions extend Kelly's original specifications such that dichotomy is not a constraint but one of the ways in which elements can be rated against construct poles. This is the essence of the first of the two new procedures that have been proposed in this research. The revision to assumption six acknowledges that although construct poles may be complementary in some instances they are irrelevant to one another. Thus, in the case of irrelevance, the second of the new procedures allows a construct to be split and the poles rated independently of one another.

### **Constructs as Linguistic Variables**

To this point, the significance of degree of membership of fuzzy subsets has not been elaborated. Clearly, in classical set theory the issue of degree does not arise since elements are valued in only one of two ways, as members or non-members of sets. The same applies to fuzzy subsets at the extremes, where fuzzy subsets have the attributes of classical sets. For example, in the fuzzy construct subset *arrogant*,  $e_4$  and  $e_2$  have membership values at the extremes of 1 and 0 respectively. No difficulty arises here in regard to the interpretation of these values,  $e_4$  is construed as *arrogant* whereas  $e_2$  is not.

In contrast consider those circumstances where membership values lie in some intermediate position. For example, in the fuzzy construct subset *arrogant* elements  $e_1$  and  $e_3$  have membership values in intermediate positions of 0.4 and 0.6 respectively. Difficulties arise here in attempting to describe the degree of membership for these intermediate values. It may be seen that  $e_3$  has a larger membership value than  $e_1$ .

Can it be said that  $e_3$  is more Arrogant than  $e_1$ ? In common sense terms the answer is "yes" but in terms of the way in which the construct is framed the answer is "no". The word *arrogant* describes the boundary of the fuzzy subset but no descriptors are available to differentiate membership values in the interval  $[0, 1]$ .

Human beings manipulate both linguistic and numerical variables. A variable is linguistic if its values are linguistic rather than numerical. When the variable *Age* is described in terms such as *young*, *not young*, *very young* or *old*, the variable is linguistic not numerical even though the base variable is numerical. That is, age can be described but also measured at the ratio level of measurement. In contrast, descriptors such as *beautiful*, *handsome*, *pretty*, *cute*, *attractive*, *very attractive* or *not very attractive* are values of the linguistic variable *Appearance*. Descriptors such as *beautiful*, *unattractive* or *ugly* are *primary terms*. Terms such as *not* and *very* are *linguistic hedges* which modify the meaning of primary terms. The totality of values of a linguistic variable (the primary terms together with their linguistic hedges if any) constitute the term set. In theory the term set can have an infinite number of values (Zadeh 1975, pp. 201-2).

### Contrast Intensification

When personal constructs are logical the poles may be regarded as primary terms of some underlying linguistic variable.

For example when applied to an individual the construct *good* – *bad* may be regarded as values of the linguistic variable *Character*, such that it is often said of people that they have a good or a bad character as the case may be. Similarly in cases where personal constructs are peculiar the poles may also be regarded as primary terms

provided that they can be rationalised in relation to some underlying dimension. Verbal descriptions may be more difficult to achieve in this case.

Consider the fuzzy construct subset  $\tilde{C}_1$  (Arrogant).

$$\tilde{C}_1 = \{(e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 1.0)\} \quad (3.30)$$

Elements  $e_2$  and  $e_4$  are easily differentiated. The membership values of 0 and 1 respectively highlight the opposition of the primary terms *arrogant* and *reserved* which constitute the poles of the construct. In this sense the elements  $e_2$  and  $e_4$  may be regarded as explicitly hedged. However the intermediate membership values, for  $e_1$  and  $e_3$ , suggest that *implicit* linguistic hedges were employed when those elements were construed. An operation that amplifies the effect of such implicit hedges is *contrast intensification* (INT) (Kickert 1978, pp. 170-1).

The following relations indicate the contrast intensification procedure as applied to fuzzy personal constructs.

$$\begin{aligned} \mu_{\text{INT}(\tilde{C}_1)}(e_j) = & \begin{aligned} & 2 \left[ \mu_{\tilde{C}_1}(e_j) \right]^2 & \text{for} & 0 \leq \mu_{\tilde{C}_1}(e_j) \leq 0.5 \\ & 1 - 2 \left[ 1 - \mu_{\tilde{C}_1}(e_j) \right]^2 & \text{for} & 0.5 \leq \mu_{\tilde{C}_1}(e_j) \leq 1 \end{aligned} \end{aligned} \quad (3.31)$$

### Example 6

Consider again the fuzzy construct subset  $\tilde{C}_1$  (Arrogant).

$$\tilde{C}_1 = \{(e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 1.0)\} \quad (3.32)$$

The membership values after contrast intensification are shown below.

$$\mu_{\text{INT}(C_1)}(e_j) = \{(e_1, 0.32), (e_2, 0.0), (e_3, 0.68), (e_4, 0.1)\} \quad (3.33)$$

It may be noted that the membership for politicians  $e_2$  and  $e_4$  are unaffected by this operation.

This is to be expected since membership values that are at the boundaries of the fuzzy construct subset represent not only an explicit but also a maximum hedge. In general membership values 0 and 1 and 0.5 are invariant under contrast intensification. Membership values less than 0.5 are diminished whilst values greater than 0.5 are increased (Kickert 1978, p. 170).

This aspect of fuzzy set theory was not pursued in the current research. However, it touches on the notion of 'latitudes of acceptance and rejection in attitude measurement'. When a person provides a rating on a bipolar scale the latitude of acceptance is 'the most acceptable position plus other positions the individual finds acceptable ... The latitude of rejection is defined as the most objectionable position to the individual ... plus other positions' which are 'also objectionable'. The notion of latitude is not new and was recognised as early as 1928 by Thurstone (Hesketh, Pryor, Gleitzmen & Hesketh, 1988, pp. 430-31). The *Decomposition Theorem*, which is presented in the next section, could be a basis for exploring latitude in ratings at the level of the individual but also between individuals.

## Decomposing Fuzzy Subsets

Any fuzzy subset may be decomposed into ordinary subsets according to the value of the coefficient  $\alpha_l$  where  $\alpha \in [0,1]$ ,  $l=1, 2, \dots, q$  (Kaufmann 1975, p. 29). Such sets are known as  $\alpha$ -level sets (Zadeh 1975, p. 31). The term  $\alpha$ -level subsets will be used in the current research to refer to sets generated by decomposition. When referring to constructs the term  $\alpha$ -level construct subset will be used. Similarly when referring to elements the term  $\alpha$ -level element subset will be used.

Any fuzzy construct subset may be decomposed such that:

$$\tilde{C}_i = \text{MAX}_{\alpha_l} \left[ \alpha_1 \cdot C_{i,\alpha_1}, \alpha_2 \cdot C_{i,\alpha_2}, \dots, \alpha_n \cdot C_{i,\alpha_l} \right], i=1, 2, \dots, m, l=1, 2, \dots, q \quad (3.34)$$

$$\mu_{C_{i,\alpha_l}}(e_j) = 1 \quad \text{if} \quad \mu_{\tilde{C}_i}(e_j) \geq \alpha_l \quad (3.35)$$

$$\mu_{C_{i,\alpha_l}}(e_j) = 0 \quad \text{if} \quad \mu_{\tilde{C}_i}(e_j) < \alpha_l \quad (3.36)$$

### Example 8

The fuzzy construct subset  $\tilde{C}_1$  (Arrogant) can be decomposed as shown below.

$$\begin{aligned} \tilde{C}_1 &= \text{MAX} \left( (0.4) \cdot \begin{array}{|c|c|c|c|} \hline e_1 & e_2 & e_3 & e_4 \\ \hline 1 & 0 & 1 & 1 \\ \hline \end{array}, (0.6) \cdot \begin{array}{|c|c|c|c|} \hline e_1 & e_2 & e_3 & e_4 \\ \hline 0 & 0 & 1 & 1 \\ \hline \end{array}, (1.0) \cdot \begin{array}{|c|c|c|c|} \hline e_1 & e_2 & e_3 & e_4 \\ \hline 0 & 0 & 0 & 1 \\ \hline \end{array} \right) \\ &= \left\{ (e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 1.0) \right\} \end{aligned} \quad (3.37)$$

From the above it is evident that the number of init entries in each of the  $\alpha$ -level construct subsets decreases as  $\alpha_l$  increases. Subsequently it will be shown that decomposition of fuzzy subsets can be employed as a basis for estimating the similarity

of constructs and the similarity of elements in a repertory grid. Inclusion, which is discussed below is integral to that process.

### **Inclusion**

Earlier it was mentioned that inclusion was a generalised form of intersection among fuzzy subsets. Inclusion is discussed in detail below. Whilst the discussion pertains to fuzzy construct subsets it is equally applicable to *fuzzy element subsets*.

Let  $\tilde{C}_i$  and  $\tilde{C}_k$  be two fuzzy construct subsets.  $\tilde{C}_i$  is included in  $\tilde{C}_k$  if

$$\forall e_j \in E : \mu_{\tilde{C}_i}(e_j) \leq \mu_{\tilde{C}_k}(e_j) \quad (3.38)$$

This is written as  $\tilde{C}_i \subset \subset \tilde{C}_k$  where  $\subset \subset$  denotes inclusion.

### **Example 9**

Consider again the fuzzy construct subset  $\tilde{C}_1$  (Arrogant)

$$\tilde{C}_1 = \{(e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 0.8)\} \quad (3.39)$$

Suppose that the fuzzy construct subset  $\tilde{C}_2$  (Shrewd) is

$$\tilde{C}_2 = \{(e_1, 0.7), (e_2, 0.4), (e_3, 0.8), (e_4, 1.0)\} \quad (3.40)$$

$$\tilde{C}_1 \subset \subset \tilde{C}_2 \text{ since } \forall e_j \in E : \mu_{\tilde{C}_1}(e_j) \leq \mu_{\tilde{C}_2}(e_j) \quad (3.41)$$

That is,  $\tilde{C}_1$  is included in  $\tilde{C}_2$  since each of the membership values in the fuzzy construct subset *arrogant* is less than or equal to the corresponding membership values in the fuzzy construct subset *shrewd*.



The criterion embedded in (3.38) represents a 'strict' form of inclusion. It requires that for one fuzzy construct subset to be *included* in another, every element of that subset must have a membership value that is less than or equal to that of each corresponding element in another designated fuzzy construct subset. Thus, following Kaufmann (1975, p. 9), strict inclusion is denoted by  $\subset\subset$  as in Example 9. Other criterion may be used such as a requirement that only a certain proportion of elements in one fuzzy construct subset have membership values which are less than or equal to those in another specified fuzzy construct subset. This is a 'weak' form of inclusion (Smithson 1987, pp. 31-2).

In the current research inclusion is not determined by a once only evaluation of the membership values of a designated fuzzy construct subset with the corresponding values in another. Rather each fuzzy construct subset is decomposed into a number of  $\alpha$ -level construct subsets and individual comparisons are made at each  $\alpha_i$ . At a particular level of  $\alpha_i$  an  $\alpha$ -level construct subset is included in another not in absolute terms but to a degree according to the number and the correspondence of unit entries in the two  $\alpha$ -level construct subsets under consideration. At each  $\alpha_i$  an inclusion coefficient which is bounded on  $[0,1]$  can be calculated. It represents the grade of inclusion of one  $\alpha$ -level construct subset in another  $\alpha$ -level construct subset. Thus a weak form of inclusion is used in the current research. It may be argued that this represents 'a truly fuzzy theory of sets' (Smithson 1987, p. 31). Weak inclusion is denoted by  $\subset$ .

### **The Similarity of Constructs in a Repertory Grid**

From the foregoing it may be seen that the principle of decomposition and the concept of inclusion are necessary and complementary to one another. Together they form a

basis for estimating the relatedness or similarity of construct pairs. This opens the way for estimating the global relatedness or similarity of all of the constructs in a repertory grid. The example below shows how the conjunction of decomposition and inclusion was used in the current research.

### Example 10

Consider again the fuzzy construct subsets  $\tilde{C}_1$  (Arrogant) and  $\tilde{C}_2$  (Shrewd)

$$\tilde{C}_1 = \{(e_1, 0.4), (e_2, 0.0), (e_3, 0.6), (e_4, 0.8)\} \quad (3.42)$$

$$\tilde{C}_2 = \{(e_1, 0.7), (e_2, 0.4), (e_3, 0.8), (e_4, 1.0)\} \quad (3.43)$$

These subsets can be decomposed as shown in Table 3.7 below.

Table 3.7: The Decomposition of Fuzzy Construct Subsets

$\alpha$ - Level Construct Subsets	$C_{1,e_1}$	$C_{1,e_2}$	$C_{1,e_3}$	$C_{1,e_4}$	$C_{2,e_1}$	$C_{2,e_2}$	$C_{2,e_3}$	$C_{2,e_4}$	Inclusion Coefficient
0.0 <sup>(a)</sup>	1	1	1	1	1	1	1	1	1.00
0.1	1	0	1	1	1	1	1	1	0.75
0.2	1	0	1	1	1	1	1	1	0.75
0.3	1	0	1	1	1	1	1	1	0.75
0.4	1	0	1	1	1	1	1	1	0.75
0.5	0	0	1	1	1	0	1	1	0.67
0.6	0	0	1	1	1	0	1	1	0.67
0.7	0	0	0	1	1	0	1	1	0.33
0.8	0	0	0	1	0	0	1	1	0.50
0.9	0	0	0	0	0	0	0	1	0.00
1.0	0	0	0	0	0	0	0	1	0.00

(a) Wherever  $\alpha_j = 0.00$  the elements of the vectors representing the  $\alpha$  - level subsets contain only unit entries.

Equation (3.44) below shows the vector algebra used to calculate a coefficient, which measures the inclusion of one  $\alpha$  - level construct subset in another. The coefficient, which will be called the *Inclusion Coefficient*, is equivalent in form to the Tanimoto Coefficient for binary valued data vectors (Spillman, Spillman & Bezdek, 1980, p. 296). Like the Jackard coefficient coabsence (the presence of zero entries in corresponding positions) does not contribute to the measured level of inclusion of one construct in another (Gordon 1981, p. 19). Since  $\alpha$  - level construct subsets are binary valued data

vectors it is appropriate to use this vector algebra. In the next chapter it will be shown how this vector algebra can be extended to binary valued data matrices. The inclusion coefficients for each of  $\alpha$ -level construct subsets in Table 3.7 are shown in the last column. As noted in note (a) above when  $\alpha_i = 0.00$  then by definition the inclusion coefficient is 1.00.

$$C_{i,(\alpha_i)} \subset C_{k,(\alpha_k)} = \frac{C_{i,(\alpha_i)} C_{k,(\alpha_k)}^t}{C_{i,(\alpha_i)} C_{i,(\alpha_i)}^t + C_{k,(\alpha_k)} C_{k,(\alpha_k)}^t - C_{i,(\alpha_i)} C_{k,(\alpha_k)}^t}, \quad (3.44)$$

$$i = 1, 2, \dots, m, k = 2, 3, \dots, m, i \neq k$$

For clarity the  $(e_j)$  notation has been dropped from the vectors  $C_i$  and  $C_k$  in (3.44). The superscript  $t$  indicates the transpose of a vector.

It may also be noted that in (3.44) weak inclusion is acknowledged by the use of  $\subset$  not  $\subset\subset$ . However, the expression will accommodate cases of strict inclusion which in relation to  $\alpha$ -level construct subsets arises when two  $\alpha$ -level construct subsets comprise only unit entries.

### Example 11

The vector algebra shown below demonstrates how equation (3.44) was used to derive the values of the inclusion coefficient shown in Table 3.7. This example relates to the  $\alpha$ -level construct subsets  $\tilde{C}_1$  and  $\tilde{C}_2$  for  $\alpha_1 = 0.1$ .

$$C_{1,(0.1)} \subset C_{2,(0.1)} = \frac{C_{1,(0.1)} C_{2,(0.1)}^t}{C_{1,(0.1)} C_{1,(0.1)}^t + C_{2,(0.1)} C_{2,(0.1)}^t - C_{1,(0.1)} C_{2,(0.1)}^t} \quad (3.45)$$

$$\mathbf{C}_{1,(0.1)} \mathbf{C}_{2,(0.1)}^t = \begin{bmatrix} 1 & 0 & 1 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = 3 \quad (3.46)$$

$$\mathbf{C}_{1,(0.1)} \mathbf{C}_{1,(0.1)}^t = \begin{bmatrix} 1 & 0 & 1 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 0 \\ 1 \\ 1 \end{bmatrix} = 3 \quad (3.47)$$

$$\mathbf{C}_{2,(0.1)} \mathbf{C}_{2,(0.1)}^t = \begin{bmatrix} 1 & 1 & 1 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = 4 \quad (3.48)$$

$$\begin{aligned} \text{Thus, } \mathbf{C}_{1,(0.1)} \subset \mathbf{C}_{2,(0.1)} &= \frac{\mathbf{C}_{1,(0.1)} \mathbf{C}_{2,(0.1)}^t}{\mathbf{C}_{1,(0.1)} \mathbf{C}_{1,(0.1)}^t + \mathbf{C}_{2,(0.1)} \mathbf{C}_{2,(0.1)}^t - \mathbf{C}_{1,(0.1)} \mathbf{C}_{2,(0.1)}^t} \\ &= \frac{3}{3+4-3} \\ &= 0.75 \end{aligned} \quad (3.49)$$

It may be seen in Table 3.7 that the values of the inclusion coefficient decrease monotonically until the value jumps from 0.33 at  $\alpha_7 = 0.7$  to 0.50 at  $\alpha_8 = 0.8$ . This is expected since the value of the inclusion coefficient is determined not only by the number of unit entries in the  $\alpha$ -level construct subsets but also by the number of unit entries, which occupy corresponding positions in the vectors. Thus, although the absolute number of unit entries may be declining the proportion, which occupy corresponding positions may increase thus leading to an increase in the inclusion coefficient. Therefore, whilst it may generally be expected that the value of the inclusion coefficient will decrease as  $\alpha_j$  increases, it is not universally so.

## Elements as Fuzzy Subsets

Section 2 addressed the representation of constructs as fuzzy subsets and the operations, which can be performed on them. The elements in a repertory grid can be treated in similar fashion. Only a change in orientation is required in order to achieve this. The conceptual basis is largely the same as that which has been already presented in relation to constructs. Therefore the material in this section will be presented without copious explanation except as where necessary.

As in the previous section the example of politicians will be used for exposition.

Let  $C$  be a set of  $m$  elements:

$$C = \{c_1, c_2, \dots, c_m\} \quad (3.50)$$

$C$  is the reference set whose elements are constructs. Every element  $c_i, 0 < i \leq m$  has full membership of  $C, C = \{1, 1, \dots, 1\}$ . Thus,  $C$  is not fuzzy. Continuing the example of politicians the constructs, which make up the reference set, are:

$$C = \{c_1, \text{arrogant} ; c_2, \text{shrewd} ; c_3, \text{rude in public} ; c_4, \text{capitalist focus}\} \quad (3.51)$$

The politicians can be regarded as *fuzzy element subsets* of  $C$ . These subsets have members which are the constructs in the reference set according to the following:

Let  $C$  be a finite set of elements and let  $c_i$  be an element of  $C$ . Then a fuzzy element subset  $\tilde{E}_j$  of  $C$  is a set of ordered pairs such that

$$\tilde{E}_j = \left\{ \left( c_i \mid \mu_{\tilde{E}_j}(c_i) \right) \right\}, \forall c_i \in C, 0 < i \leq m, 0 < j \leq n \quad (3.52)$$

$\mu_{\tilde{E}_j}(c_i)$  is a membership characteristic function, which takes its values in the totally ordered set  $M = [0, 1]$  and indicates the degree of membership of  $c_i$  in  $\tilde{E}_j$ . If  $M = \{0, 1\}$  then the fuzzy construct subset is understood to be a *non-fuzzy* construct subset or *ordinary* construct subset  $E_j$ .

(From this point the index ranges  $0 < i \leq m$ , and  $0 < j \leq n$  will be omitted. It will be understood that when  $c_i$  or  $\mu_{\tilde{E}_j}(c_i)$  is used the reference is to the elements of  $C$ .)

### Example 12

Consider the fuzzy element subset of constructs  $\tilde{E}_1$  which represents politician  $e_1$ .

$$\tilde{E}_1 = \left\{ (c_1, 1.0), (c_2, 0.7), (c_3, 0.6), (c_4, 0.0) \right\} \quad (3.53)$$

This fuzzy element subset says something about perceptions of this politician. The membership values of this fuzzy subset could be intensified, by using the contrast intensification operation in (3.23). Thus:

$$\mu_{\text{INT}, \tilde{E}_1}(c)_i = \left\{ (c_1, 1.0), (c_2, 0.82), (c_3, 0.68), (c_4, 0.00) \right\} \quad (3.54)$$

This intensified subset emphasises the character of politician  $e_1$  as *arrogant*  $c_1$ , *shrewd*  $c_2$ , *rude in public*  $c_3$  and definitely not *capitalist focused*  $c_4$ .

### Complementation

The complementary fuzzy subset  $\tilde{E}'_j$  can be derived from the following:

Let  $C$  be a set with  $M = [0,1]$  its associated membership set.

$$\forall c_j \in C \mu_{\tilde{E}_j}(c_i) = 1 - \mu_{\tilde{E}_j}(c_i) \quad (3.55)$$

### Example 13

Consider the fuzzy subset

$$\tilde{E}_1 = \{ (c_1, 1.0), (c_2, 0.7), (c_3, 0.6), (c_4, 0.0) \} \quad (3.56)$$

Using (3.55 )

$$\tilde{E}_1' = \{ (c_1, 0.0), (c_2, 0.3), (c_3, 0.4), (c_4, 1.0) \} \quad (3.57)$$

### Intersection

Let  $C$  be a set with an associated membership set  $M = [0,1]$ . Let  $\tilde{E}_j$  and  $\tilde{E}_k$  be two fuzzy element subsets.

$$\begin{aligned} \forall c_i \in E : \mu_{\tilde{E}_j} \cap \mu_{\tilde{E}_k}(c_i) &= \text{MIN}(\mu_{\tilde{E}_j}(c_i), \mu_{\tilde{E}_k}(c_i)), \\ i=1,2,\dots,m, j=1,2,\dots,n, k=1,2,\dots,n, j \neq k \end{aligned} \quad (3.58)$$

### Example 14

Consider two fuzzy subsets  $\tilde{E}_1$  and  $\tilde{E}_2$ .

$$\tilde{E}_1 = \{ (c_1, 0.2), (c_2, 0.3), (c_3, 0.2), (c_4, 0.0) \} \quad (3.59)$$

$$\tilde{E}_2 = \{ (c_1, 0.7), (c_2, 0.7), (c_3, 0.8), (c_4, 1.0) \} \quad (3.60)$$

Applying (3.58) gives

$$\mu_{\tilde{E}_1} \cap \mu_{\tilde{E}_2}(c_i) = \{ (c_1, 0.2), (c_2, 0.3), (c_3, 0.2), (c_4, 0.0) \} \quad (3.61)$$

## The Similarity of Elements in a Repertory Grid

Decomposition and inclusion can also be applied to the elements in a repertory grid in much the same manner as was indicated for constructs.

Any fuzzy element subset may be decomposed such that:

$$\tilde{E}_j = \text{MAX}_{\alpha_l} \left[ \alpha_1 \cdot E_{j,\alpha_1}, \alpha_2 \cdot E_{j,\alpha_2}, \dots, \alpha_n \cdot E_{j,\alpha_q} \right],$$

$$j=1,2, \dots, n, l=1,2, \dots, q \quad (3.62)$$

$$\mu_{E_{j,\alpha_l}}(c_i) = 1 \quad \text{if} \quad \mu_{\tilde{E}_j}(c_i) \geq \alpha_l \quad (3.63)$$

$$\mu_{E_{j,\alpha_l}}(c_i) = 0 \quad \text{if} \quad \mu_{\tilde{E}_j}(c_i) < \alpha_l \quad (3.64)$$

### Example 15

Consider two fuzzy element subsets  $\tilde{E}_1$  and  $\tilde{E}_2$ .

$$\tilde{E}_1 = \{ (c_1, 1.0), (c_2, 0.7), (c_3, 0.6), (c_4, 0.0) \} \quad (3.65)$$

$$\tilde{E}_2 = \{ (c_1, 0.7), (c_2, 0.4), (c_3, 0.8), (c_4, 1.0) \} \quad (3.66)$$

These subsets can be decomposed as shown in Table 3.8 below.

Table 3.8: The Decomposition of Fuzzy Element Subsets

$\alpha$ - Level Element Subsets	$E_{1,c_1}$	$E_{1,c_2}$	$E_{1,c_3}$	$E_{1,c_4}$	$E_{2,c_1}$	$E_{2,c_2}$	$E_{2,c_3}$	$E_{2,c_4}$	Inclusion Coefficient
0.0 <sup>(a)</sup>	1	1	1	1	1	1	1	1	1.00
0.1	1	1	1	0	1	1	1	1	0.75
0.2	1	1	1	0	1	1	1	1	0.75
0.3	1	1	1	0	1	1	1	1	0.75
0.4	1	1	1	0	1	1	1	1	0.75
0.5	1	1	1	0	1	0	1	1	0.50
0.6	1	1	1	0	1	0	1	1	0.50
0.7	1	1	0	0	1	0	1	1	0.25
0.8	1	0	0	0	0	0	1	1	0.00
0.9	1	0	0	0	0	0	0	1	0.00
1.0	1	0	0	0	0	0	0	1	0.00

(b) Wherever  $\alpha_l = 0.00$  the elements of the vectors representing the  $\alpha$  - level subsets contain only unit entries.



Shown below, is the vector algebra used to calculate the inclusion index for the elements.

$$E_{j,(\alpha_i)} \subset E_{k,(\alpha_i)} = \frac{E_{j,(\alpha_i)} E'_{k,(\alpha_i)}}{E_{j,(\alpha_i)} E'_{j,(\alpha_i)} + E_{k,(\alpha_i)} E'_{k,(\alpha_i)} - E_{j,(\alpha_i)} E'_{k,(\alpha_i)}},$$

$$j = 1, 2, \dots, n, k = 1, 2, \dots, n, i \neq k \quad (3.67)$$

### Example 16

The example shown below demonstrates how (3.65) is used to derive the values for the inclusion coefficient shown in Table 3.8. The data relates to  $\tilde{E}_1$  and  $\tilde{E}_2$  at  $\alpha_1 = 0.1$ .

$$E_{1,(0.1)} \subset E_{2,(0.1)} = \frac{E_{1,(0.1)} E'_{2,(0.1)}}{E_{1,\alpha_1} E'_{12,\alpha_1} + E_{2,(0.1)} E'_{2,(0.1)} - E_{1,(0.1)} E'_{2,(0.1)}} \quad (3.68)$$

$$E_{1,(0.1)} E'_{2,(0.1)} = \begin{bmatrix} 1 & 1 & 1 & 0 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = 3 \quad (3.69)$$

$$E_{1,(0.1)} E'_{1,(0.1)} = \begin{bmatrix} 1 & 1 & 1 & 0 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 1 \\ 1 \\ 0 \end{bmatrix} = 3 \quad (3.70)$$

$$E_{2,(0.1)} E'_{2,(0.1)} = \begin{bmatrix} 1 & 1 & 1 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = 4 \quad (3.71)$$

Thus,

$$E_{1,(0.1)} \subset E_{2,(0.1)} = \frac{E_{1,(0.1)} E'_{2,(0.1)}}{E_{1,(0.1)} E'_{1,(0.1)} + E_{2,(0.1)} E'_{2,(0.1)} - E_{1,(0.1)} E'_{2,(0.1)}}$$

$$= \frac{3}{3+4-3}$$

$$= 0.75 \quad (3.72)$$

## Conclusion

Two objectives have been realised in this chapter. The first was to demonstrate that in essence Kelly's dichotomy corollary rendered constructs as classical sets. Under such a scheme, the elements in a grid belong either to the set represented by the explicit pole of a construct or to the set as represented by its implicit pole. However, it was argued that such a form of representation is unduly restrictive and that fuzzy set theory provides a basis for representing constructs in a more realistic manner. Thus the second objective was to demonstrate that personal constructs can be represented as fuzzy subsets. The ratings, which are attached to them, can be read as representing membership values of the fuzzy subset named according to the explicit pole of each construct. The complementary rule and the intersection rule as related to fuzzy subsets were presented. It was also shown that when constructs are elicited the issue of sense and relevance must be explicitly addressed. Thus, a new procedure has been recommended such that peculiar constructs can also be treated as fuzzy subsets, and modified when they cannot be reconciled as a dimension. This obviates the problem of sense and relevance in the elicitation process.

In relation to set theory it has been shown that the relationship of constructs can be understood by examining the intersection of sets. It was shown that research on cognitive complexity has implicitly employed the notion of intersection in generating the most popular measures which are those derived by Bieri (1955) and Bannister (1960, 1962). The notion of inclusion represents a form of intersection that is apparent when fuzzy subsets are decomposed into binary valued sets.

The following chapter which concludes part one of this thesis builds on the work presented here by presenting a mathematical model in which constructs and elements are represented as fuzzy subsets. The model employs decomposition and the principle of inclusion to produce indices of form for a cognitive structure. As has been argued, form is one of the two constituents of cognitive structure, the other being content.

## CHAPTER 4

### THE FUZZY-PCP MODEL

#### Introduction

##### Theoretical Synergies

A correspondence between the researcher and Professor Vladimir Geroimenko in 1994 indicated that there were good reasons to merge the ideas of Kelly expressed in the Psychology of Personal Constructs and those of Zadeh on Fuzzy-Sets. In a subsequent published paper Geroimenko (1996, p. 78) said:

I should like to consider the fundamental ideas and concepts of one of the most interesting conceptions called Fuzzy-Logic. I shall try to do so in such a way so as you could see the principle proximity of the conceptual basis of the logic of Fuzzy-Sets to the Psychology of Personal Constructs.

He argued that:

A detailed analysis of both the theories ... could lead to the construction of a special hybrid theory which could be called *Fuzzy-PCP* (Geroimenko 1996, p. 78).

In the conclusion to his paper Geroimenko said:

Of course, any further comparison of the idea and mathematical apparatus of the theories by Kelly and Zadeh with the aim of finding some possible points (and fields) of their integration is connected with serious difficulties. The main difficulty is that the researcher has to rise above the level of both the theories in order to find himself [*sic*] at some, "metatheoretical" level to see quite clearly not only the difference between the theories by Kelly and Zadeh, but also the common character of the theories. But, at the same time the attempts directed at constructing a Fuzzy-PCP must, to my mind, be crowned with success because there is principal *compatibility* between the conceptual bases of both the theories and the mathematical and graphic means of their expression as well (Geroimenko 1996, p. 80).

[The italics are to alert the reader that where in the original the word *incompatibility* was used the word *compatibility* has been substituted. In the context of the paper, and from the content and of tone of the paragraph the word *incompatible* made no sense. Thus, it was assumed that this was a quirk of language and the alteration was made.]

Geroimenko could see that there was common ground between Kelly and Zadeh. Similarly Gaines and Shaw (1981) and Shaw and Gaines (1984) promoted the synergies between Kelly's work and that of Zadeh. They made a further contribution by detailing an interactive computer program, PEGASUS, for the elicitation and analysis of constructs. That technology was subsequently embedded in a newer piece of software name RepGrid.

### **Operationalising Theory**

Flowing from the work in the previous chapter it was necessary to move from theory towards practice. Firstly there was a need to demonstrate that it was possible to operationalise repertory grids as fuzzy entities. Secondly, since it was decided to adopt similar logic to that of Bieri (1955) and Bannister (1960,1962) to estimate the similarity of constructs and elements, a suitable method of achieving this was required. Software such as INGRID (Slater 1977), GPACK (Bell 1987) and RepGrid (Gaines and Shaw 1990) employ factor analysis or a variant of it for the analysis of grid data. RepGrid also provides a method of cluster analysis in the FOCUS routine. This routine rearranges the constructs and elements in a grid such that those most similar to one another are contiguous.

In the early period of the current research a copy of RepGrid was purchased with a view to using it for interactive grid elicitation and also for the analysis of repertory grids. Whilst the software was not complex participants would have required some training before it could be used in the interview setting. This would have generated time pressure and distractions that may have compromised the quality of the research process and the quality of outcomes. Thus the researcher formed the view that it would

be counter-productive to use of the RepGrid for the current research. The earlier experience of using the COPE software for the cognitive mapping exercise reinforced this view. It was resolved that when fully developed a one to one method of construct elicitation would be more suitable for the current research not only because it would be less problematic but also because it would reflect the methodological innovations of the current research. Similarly after an evaluation of INGRID and GPACK it became evident that it would be necessary to develop a mathematical model founded on the synergies between PCP and Fuzzy Set theory. The method to be used for estimating the similarity between constructs and elements was founded on the *Decomposition Theorem* and the principle of *Inclusion* not on factor analysis or related methods.

The objectives in this chapter are to operationalise constructs and elements as *fuzzy subsets*, and to apply decomposition and inclusion to generate similarity measures for them. It is necessary to achieve these objectives to demonstrate that the research methodology exemplifies continuity in development, and integrity.

The Fuzzy-PCP model introduced in section 1 represents endeavours to achieve the two objectives mentioned above. Whilst it was possible and necessary to test the model by manually performing calculations with matrices this was prohibitive in terms of testing the efficacy of the model in an extensive way. Thus the eventual outcome was the writing and testing of a software program named FUZZYGRID. This program is introduced towards the end of this chapter.

### The Fuzzy-PCP Model

The model is an expression of two primary ideas. The first is that repertory grids can be represented as two-dimensional *fuzzy entities*. Viewed in terms of the rows, the ratings refer to *fuzzy construct subsets* named according to the explicit pole of a construct. In terms of the columns, the ratings refer to *fuzzy element subsets* named according to the element under consideration.

The second primary idea is that of *intraindividual consensus*. This term is introduced here as an omnibus. It describes not only the measure of construct relatedness proposed in this thesis but also the cognitive complexity measures derived by other researchers such as Bieri (1955), Bannister (1960, 1962) and Crockett (1965). Spillman, Spillman and Bezdek (1980) presented a method for calculating a measure of group consensus. It was a summative paper which integrated the seminal work of Zadeh (1965) with work on group consensus by Blin and Whinston (1974), Blin (1974), and a series of papers by Bezdek, Spillman and Spillman, (1977, 1978, 1979) and Spillman, Bezdek and Spillman (1979a, 1979b).

After an analysis of these papers, it appeared that if a measure of group consensus, which is *interindividual*, can be derived, then a measure of *intraindividual* consensus can be derived through the application of similar logic. That is, fuzzy construct subsets may be treated as members of a *synthetic group* and their similarity estimated. Subsets that are tightly knit may indicate a simple form. A looser configuration may point to a more subtle system of discriminations.

### Loose Duality in Repertory Grids

The concept of duality has been applied extensively in operations research and in mathematical economics. A classic example is the production management problem in linear programming. The problem is usually expressed in terms of maximising returns from a number of products, having regard to the contribution of each to profit, their resource requirements and the resources available. This is termed the *primal* problem. The problem can be transposed to the *dual*, which focuses on the contribution to costs of each product relative to the underlying value of resources needed to produce them. In the former case the objective is to maximise contribution, in the latter it is to minimize cost. Each specification is a mirror and each is complementary to the other (Bradley, Hax and Magnanti 1977, pp. 157-86).

In repertory grid data it may be observed that there is a perfect duality between the rows and columns when the ratings in every row are identical. Such a pattern would suggest a cognitive structure that is simple in the extreme. In a grid where the ratings resemble a random configuration, the underlying cognitive structure would be interpreted as either extremely complex under Bieri's (1955) scheme, or chaotic and maladjusted under Bannister's (1961, 1962) scheme. The latter would be the most likely interpretation. In such a circumstance no *sensible* duality would be evident. Between these extremes it should be possible to observe a *loose* duality in the relationship between the constructs and the relationship between the elements such that each viewpoint is complementary to the other.

Thus, in the current research, duality has not been interpreted as it is in branches of applied mathematics and economics where one set of relationships can be derived from another by means of transposition of matrices and vectors. It was not expected



that the construct configurations would be mirrored in the element maps. The aim was to use element maps to amplify and cross validate the construct analysis. This approach reflected Block (1955). He questioned the belief that when matrices of data were generated from  $m$  persons (rows in a repertory grid representing constructs) on  $n$  variables (columns in a repertory grid representing elements) the results of Q analysis (correlating persons/constructs) were fully convertible to R analysis (correlating variables/elements). Block wrote:

The results of the Q technique are not readily convertible into the results of R where the subject population providing the data for analysis is heterogeneous with respect to the modes of interaction between variables. When homogeneity of interaction between the variables exists for all individuals within the subject sample, results from Q and R are transposable (Block 1955, p. 356).

This thinking, when applied to repertory grids elicited from individuals, means that to the extent that there is a variation in the construing of the elements on the constructs, the results of the analysis of the elements will not mirror those produced through the analysis of the constructs. However, it will be shown that the duality of a repertory grid can be exploited by analyzing the elements of a grid in an identical manner to that used for the constructs. Such analysis provides another vantage point from which to view a cognitive structure.

At this point it is appropriate to mention that just as measures of the relationship between constructs are measures of form so are those which indicate the relationship between elements. They are not measures of content per se. However, papers such as that by Reger (1990) and Ginsberg (1989) have promoted the idea that measures of the relationship between elements pertain to content. They do in so far as the elements in a repertory grid relate to a specific context under investigation. For example, in the current research, work and nonwork activities, which comprise the elements for one of the grids developed, relate to the work and nonwork context. The more important point

is that in the current research content was deemed to relate primarily to the semantics underlying the constructs. In the current research the content analysis of the grids elicited was focussed primarily on the interpretation of the constructs in conjunction with participants. Slater (1976, p. 36-7) alluded to the importance of feedback and stressed that the relationship between constructs may point to fundamental axes of meaning for individual. Thus, form often illuminates content. This will be evident from the analysis of the case studies presented in chapters 6 and 7.

### **Measures Available from the Model**

The model yields global indices of similarity or relatedness for the constructs and elements. Coefficients that indicate the similarity of construct pairs and element pairs are also available. These coefficients are reported in separate matrices. These matrices will be referred to as *construct similarity matrices* and *element similarity matrices*. Each matrix is *square* having the same dimension as the original repertory grid according to whether one is examining the construct or element matrix. Thus if an original grid has  $m$  constructs (rows) and  $n$  elements (columns); the similarity matrices for the constructs and elements will be of dimension  $m \times m$  and  $n \times n$  respectively. The matrices are also *triangular*. That is, the entries below the leading diagonal mirror the entries above the leading diagonal (Schiffman, Reynolds & Young 1981, pp. 57-8). Each entry on the leading diagonal is zero. Because of their structure these matrices can be transformed into dissimilarity matrices and used as the basis for Multidimensional Scaling Analysis (MDS). Multidimensional scaling is a technique for resolving patterns in data. Graphical output is available as are *goodness of fit* measures.

In summary, the analytical method developed in the current research represents four developmental phases. The first is the representation of a repertory grid as a fuzzy entity. The second is the development and testing of a model that yields global indices of the relatedness of constructs and elements, and also indices of similarity for the construct pairs and elements pairs in a grid. The third is the integration of the model results with a well-known analytical method MDS. Another challenge posed by the research was to examine the form of cognitive structures over time. It will be shown that it was necessary to develop and test a new scaling method to achieve this. This aspect of the research is presented in chapter 7. The completion of this work on a new scaling method meant that four distinct but integrated components of an analytical method had been developed. Each of them was founded on a credible theoretical base and tested with data collected in the field.

### Mathematical Methods

Before proceeding it is appropriate to state a caveat about mathematical methods. Such methods can engender feelings of correctness, legitimacy, comfort and certainty.

These feelings can be illusory. Gainēs and Shaw (1980, p. 180) said:

The repertory grid no matter how it is enhanced, is only a tool for allowing us to gain some view of a person's construct space ... It gives us a partial representation of the very much richer processes underlying human reasoning. *Logic* derives from these processes, not they from it, and we should beware of forcing human reasoning into a Procrustean bed of mathematical theory.

Commenting on the spatial representation of cognitive structure with cognitive maps,

Coxon, Davies and Jones (1986, p. 91) said:

Let us say that the spatial analogy can be treacherous as well as illuminating for a cognitive structure is not simply a map, nor is it best represented spatially ... It may be that several important properties of this system can be depicted spatially, but other aspects may have no natural spatial representation.

Similarly Johnson-Laird (1983) said:

Human beings understand the world by constructing working models of it in their minds. Since these models are incomplete, they are simpler than the entities they represent. In consequence, models contain elements that are merely imitations of reality – there is no working model of how their counterparts in the world operate, but only procedures that mimic their behaviour (Laird, 1983, p. 10).

Construct elicitation is a sampling process that requires considerable investigative skill (Brown 1992, p. 292). However, even the highly skilled investigator can be hampered since constructs are not always easily articulated even by those who possess a considerable intellectual and verbal capacity. Sometimes language can be an impotent conduit. Thus, inferences about cognitive structures should be made with caution. In the current research other data collected by means of questionnaires were used as an aid in evaluating indications emanating from the analysis of repertory grids. Preliminary interpretations of grids were discussed in feedback sessions held with each participant as part of the second round interview.

The mathematical basis of the FUZZY-PCP model is presented below.

### **The Mathematics of the Fuzzy-PCP Model**

The basis of the model is a *Fuzzy Repertory Grid*  $\tilde{G}$ .

Let  $E$  be a set that contains  $n$  elements.

$$E = \{e_1, e_2, \dots, e_n\} \quad (4.1)$$

$E$  is a classical set from which  $\tilde{G}$  is generated by using triadic elicitation, or a similar method.  $\tilde{G}$  is an  $m \times n$  matrix. It may be square but this is not a mandatory

requirement. The rows of  $\tilde{G}$  represent  $m$  fuzzy construct subsets; the columns represent  $n$  fuzzy element subsets.

### Generating Measures of Similarity for Constructs

The procedures for generating measures of similarity for constructs are described below.

#### Procedure 1

Transpose  $\tilde{G}$  such that  $\tilde{G}^t$  is a matrix whose dimensions are  $n \times m$ . The superscript "t" denotes a matrix that has been transposed such that what were rows in the original matrix become columns and what were columns in the original matrix become rows.

#### Procedure 2

Create  $m$  fuzzy construct matrices  $\tilde{F}_k^c, 0 < k \leq m$ , where  $m$  is the number of columns in  $\tilde{G}^t$ . The superscripts "c and e" will be used throughout to differentiate construct and element matrices.

$$\tilde{G}^t = \left\{ \tilde{g}_{i,k}^t, 0 < i \leq n, 0 < k \leq m \right\} \quad (4.2)$$

This means that each column in  $\tilde{G}^t$  is excised and used as a basis for creating fuzzy construct matrices  $\tilde{F}_k^c$ .

Each  $\tilde{F}_k^c$  matrix is  $n \times n$  where  $n$  is the number of rows in  $\tilde{G}^t$ .

$$\left( \tilde{F}_k^c \right)_{i,j} = \begin{cases} \tilde{g}_{i,k}^t, & \text{if } i = j \\ \text{MIN} \left( \tilde{g}_{i,k}^t, \tilde{g}_{j,k}^t \right), & \text{if } i \neq j \end{cases} \quad (4.3)$$

This means that the elements, which make up each column of  $\tilde{\mathbf{G}}^t$ , the  $\tilde{g}_{i,k}^t$  become the diagonal elements in each  $\tilde{\mathbf{F}}_k^c$ . The MIN rule for the intersection of fuzzy sets is applied to generate the off diagonal elements. Comparing entries  $\tilde{g}_{i,k}^t, \tilde{g}_{j,k}^t$  is equivalent to comparing entries  $\tilde{g}_{j,k}^t, \tilde{g}_{i,k}^t$ . Thus, the fuzzy construct matrices are *square and symmetric* (Schiffman, Reynolds & Young 1981, p. 14).

### **Procedure 3**

By Decomposition create *Hard Alpha Level Construct Matrices*  $\mathbf{H}_{k,\alpha_l}^c$  such that:

$$\left( \mathbf{H}_{k,\alpha_l}^c \right)_{i,j} = \begin{cases} 0 & \text{if } \left( \tilde{\mathbf{F}}_k^c \right)_{i,j} < \alpha_l \\ 1 & \text{if } \left( \tilde{\mathbf{F}}_k^c \right)_{i,j} \geq \alpha_l \end{cases}$$

$$0 < k \leq m, 0 \leq \alpha_l \leq 1, 0 < l \leq q, 0 < i, j \leq n \quad (4.4)$$

(Note that when  $l=1, \alpha_l = 0.0$  such that the hard matrices  $\left( \mathbf{H}_{k,0.00}^c \right)_{i,j}$  comprise only unit entries.)

For a given  $\alpha_l$ , this procedure generates  $m$  *hard* construct matrices  $\mathbf{H}_{k,\alpha_l}^c$  which are  $n \times n$ . These matrices are termed "hard" since all of the elements are either  $\{0,1\}$  (Spillman, Spilman & Bezdek 1980, p. 295). Each of the hard matrices is square and symmetric.

#### Procedure 4

- (a) First, compare all of the hard matrices pairwise in order to determine the level of agreement between them. For  $0 < k, k' \leq m$ ,  $k \neq k'$  define the agreement

measure  $A \left[ \mathbf{H}_{k, \alpha_l}^c, \mathbf{H}_{k', \alpha_l}^c \right]$  as:

$$A \left[ \mathbf{H}_{k, \alpha_l}^c, \mathbf{H}_{k', \alpha_l}^c \right] = \frac{\text{tr} \left[ \mathbf{H}_{k, \alpha_l}^c \left( \mathbf{H}_{k', \alpha_l}^c \right)^t \right]}{\text{tr} \left[ \mathbf{H}_{k, \alpha_l}^c \left( \mathbf{H}_{k, \alpha_l}^c \right)^t \right] + \text{tr} \left[ \mathbf{H}_{k', \alpha_l}^c \left( \mathbf{H}_{k', \alpha_l}^c \right)^t \right] - \text{tr} \left[ \mathbf{H}_{k, \alpha_l}^c \left( \mathbf{H}_{k', \alpha_l}^c \right)^t \right]} \quad (4.5)$$

In (4.5) each of the hard matrices are multiplied by their transpose  $\left( \bullet \right)^t$ .

$\text{tr} \left[ \bullet \right]$  denotes the trace operation, which is the sum of the elements on the main diagonal of the matrix generated by that multiplication.

- (b) Second, display the results in an *Alpha Level Construct Consensus Matrix*  $\mathbf{C}_{\alpha_l}^c$ .

$$\left( \mathbf{C}_{\alpha_l}^c \right)_{i,j} = \begin{cases} A \left[ \mathbf{H}_{k, \alpha_l}^c, \mathbf{H}_{k', \alpha_l}^c \right] & i = j \\ 0 & i \neq j \end{cases} \quad (4.6)$$

In the first part of the procedure represented by (4.5) each pair of matrices  $H_{k, \alpha_l}^c, H_{k, \alpha_l}^c$  is compared to determine the level of agreement between them. The agreement value is bounded on  $[0,1]$ . Equation (4.5) is an extension of the Tanimoto coefficient for binary valued data vectors to binary valued matrices (Spirman, Spillman & Bezdek 1980, p. 296).

In the second part represented by (4.6) each of these agreement values is stored in an Alpha Level Construct Consensus Matrix  $(C_{\alpha_l}^c)_{i,j}$ . Since the agreement of a hard matrix with itself is redundant all of the elements on the leading diagonal in all of the  $(C_{\alpha_l}^c)_{i,j}$  have a default value of 0.00. The elements off the leading diagonal show the level of agreement between the hard matrix pairs. All consensus matrices are square and symmetric.

### **Procedure 5**

Derive a measure of the  $\alpha_l$  - Construct Consensus,  $K_{\alpha_l}^c$  using

$$K_{\alpha_l}^c = \frac{tr(C_{\alpha_l}^c)^2}{m(m-1)}, 0 \leq \alpha_l \leq 1, 0 < l \leq q \quad (4.7)$$

Recall that  $m$  is the number of hard matrices under consideration.



In Spillman, Spillman and Bezdek (1980, p. 297), the expression used to derive an  $\alpha$ -level measure of group consensus  $K_\alpha$  was,  $K_\alpha = \frac{2\text{tr}(\mathbf{C}_\alpha \mathbf{C}_\alpha^t)}{n(n-1)}$ , where  $n$  is the number of members in a group. A manual recalculation of the  $K_\alpha$ , using the data presented in the paper, produced results which could not be reconciled with those reported by them. In all cases the values derived for  $K_\alpha$  were double those reported in the paper. In some cases the  $K_\alpha$  exceeded 1.0. This was nonsensical. Eliminating "2" in the numerator rectified this problem. Equation (4.7) reflects this amendment. Since the  $\mathbf{C}_\alpha$  are square and symmetrical  $(\mathbf{C}_\alpha \mathbf{C}_\alpha^t)$  has been written as  $(\mathbf{C}_\alpha^c)^2$  in (4.7).

#### Procedure 6

The estimation of the overall level of construct consensus is a recursive process that requires procedures three, four and five to be repeated according to the *granularity* of the alpha cuts. The finer is the granularity the greater is the number of repetitions required. Thus, if a step-size of 0.1 were used on [0,1], procedures three through to five inclusive would be repeated nine times. In the current research simulations were conducted to assess the variation in estimates consequent upon different degrees of granularity. After weighing the time taken by the program FUZZYGRID to compute estimates an election was made to use a step-size of 0.1 for all calculations. This effected a good balance between the precision required in the estimates and the time to generate solutions. The granularity was neither too fine nor too course.

During each recursion new *Hard Alpha Level Construct Matrices*  $\mathbf{H}_{k,\alpha_l}^c$ , *Alpha Level*

*Construct Agreement* measures  $A\left[\mathbf{H}_{k,\alpha_l}^c, \mathbf{H}_{k,\alpha_l}^c\right]$  and *Alpha Level Construct Consensus*

Matrices  $C_{\alpha_i}^c$  are created. The *Alpha Level Construct Consensus* coefficient  $K_{\alpha_i}^c$  is also calculated.

The recursive process is stated as follows:

Repeat procedures three, four and five until  $\alpha_i = 1.0$ .

### Procedure 7

(a) First, calculate a measure of *Global Construct Consensus*,  $K_G^c$  using:

$$K_G^c = \frac{1}{2I} \left( K_{\alpha_1}^c + 2K_{\alpha_1}^c + 2K_{\alpha_2}^c + \dots + K_{\alpha_q}^c \right) \quad (4.8)$$

It was earlier noted that all of the hard matrices  $H_{k,\alpha_1}^c$  contain only unit entries. It follows that  $C_{k,\alpha_1}^c$  also contains only unit entries except for those on the leading diagonal which are zero. Since  $K_{\alpha_1}^c$  is derived from  $C_{k,\alpha_1}^c$ ,  $K_{\alpha_1}^c = 1$ . This follows (Spillman, Spillman & Bezdek, 1980, p. 297). In the model presented here the  $K_{\alpha_i}^c$  are found by multiplying the Alpha Level Consensus Matrices  $C_{\alpha_i}^c$  by their transpose  $(C_{\alpha_i}^c)^t$  and averaging the trace. Multiplying a square symmetric matrix by its transpose is equivalent to squaring it. Therefore, it seems reasonable to apply the root mean square to the  $K_{\alpha_i}^c$ . For these reasons (4.8) is rewritten as:

$$K_G^c = \sqrt{\frac{1}{2I} \left( 1 + 2K_{\alpha_1}^c + 2K_{\alpha_2}^c + \dots + K_{\alpha_q}^c \right)} \quad (4.9)$$

Thus, (4.9) is different to the equation found in Spillman, Spillman and Bezdek (1980, p. 299) where the *root mean square* does not appear in the expression for deriving a global estimate of group consensus  $K$ .

$K_G^c$  is a global measure, which indicates the relatedness of constructs in a grid. The range of  $K_G^c$  is  $[0,1]$ . At its minimum it suggests a complex system evidenced by maximal differentiation between the constructs. However, what may sometimes appear to be a complex system may border on incoherence (Bannister 1960, 1962).

(b) Second, calculate a measure of the *Global Pairwise Agreement* of the constructs,

$A_G \left[ H_k^c, H_k^c \right]$  using:

$$A_G \left[ H_k^c, H_k^c \right] = \frac{1}{2J} \left( A \left[ H_{k, \alpha_1}^c, H_{k, \alpha_1}^c \right] + 2A \left[ H_{k, \alpha_2}^c, H_{k, \alpha_2}^c \right] + 2A \left[ H_{k, \alpha_3}^c, H_{k, \alpha_3}^c \right] + \dots \right. \\ \left. + A \left[ H_{k, \alpha_q}^c, H_{k, \alpha_q}^c \right] \right) \quad (4.10)$$

Since all of the hard matrices  $H_{k, \alpha_1}^c$  contain only unit entries  $A \left[ H_{k, \alpha_1}^c, H_{k, \alpha_1}^c \right] = 1$ .

Therefore, (4.10) can be rewritten as:

$$A_G \left[ H_k^c, H_k^c \right] = \frac{1}{2J} \left( 1 + 2A \left[ H_{k, \alpha_2}^c, H_{k, \alpha_2}^c \right] + 2A \left[ H_{k, \alpha_3}^c, H_{k, \alpha_3}^c \right] + \dots \right. \\ \left. + A \left[ H_{k, \alpha_q}^c, H_{k, \alpha_q}^c \right] \right) \quad (4.11)$$

$A_G \left[ H_k^c, H_k^c \right]$  ranges on  $[0,1]$  and indicates the similarity of the constructs as pairs.

When arranged as a matrix these values may be interpreted as representing a similarity matrix for the constructs  $S^c$ . Such a matrix can easily be transformed into a dissimilarity matrix  $D^c$  using equation (4.12) below.

$$\left( D^c \right)_{i,j} = 1 - s_{i,j}^c, \quad i=1,2, \dots, m, \quad j=1,2, \dots, m, \quad i \neq j \quad (4.12)$$

This form of matrix can be used for multidimensional scaling analysis.

Procedures 1 through to seven, which include the recursive pattern indicated by procedure six, constitute the mechanics of the model in relation to estimating the similarity of the constructs. The procedures for the elements in a grid are identical with the exception that  $\tilde{G}$  does not need to be transposed as in procedure one above. These are presented later in this chapter.

Example 4.1 below details the operation of the procedures in the model in relation to the constructs in a repertory grid.

#### Example 4.1

A hypothetical fuzzy grid  $\tilde{G}$  is shown below. The constructs relate to four politicians.

Table 4.1: Fuzzy Grid for Politicians

Fuzzy Subsets Constructs/Elements	$\tilde{E}_1$	$\tilde{E}_2$	$\tilde{E}_3$	$\tilde{E}_4$
$\tilde{C}_1$ : Arrogant	1.0	0.4	0.5	1.0
$\tilde{C}_2$ : Shrewd	0.5	0.6	0.8	0.1
$\tilde{C}_3$ : Rude in public	1.0	0.1	0.4	0.9
$\tilde{C}_4$ : Capitalist focus	1.0	0.8	0.6	1.0

By using Procedure 1  $\tilde{G}$  is transposed to  $\tilde{G}^t$ .  $\tilde{G}^t$  is shown below.

Table 4.2: Transposed Fuzzy Grid

Fuzzy Subsets Elements/constructs	$\tilde{C}_1$	$\tilde{C}_2$	$\tilde{C}_3$	$\tilde{C}_4$
$\tilde{E}_1$	1.0	0.5	1.0	1.0
$\tilde{E}_2$	0.4	0.6	0.1	0.8
$\tilde{E}_3$	0.5	0.8	0.4	0.6
$\tilde{E}_4$	1.0	0.1	0.9	1.0

By using Procedure 2 each column in  $\tilde{G}^t$  is excised and represented separately in a fuzzy construct matrix  $\tilde{F}_k^c$ . Each of these matrices is square having four rows and columns. Since there are four constructs in  $\tilde{G}$  four fuzzy construct matrices will be required. Using (4.3) these matrices are derived as follows:

$$\left(\tilde{F}_k^c\right)_{i,j} = \begin{cases} \tilde{g}_{i,j}^t, & \text{if } i = j \\ \text{MIN}\left(\tilde{g}_{i,k}^t, \tilde{g}_{j,k}^t\right), & \text{if } i \neq j \end{cases} \quad (4.13)$$

For example, to generate the fuzzy construct matrix  $\tilde{F}_1^c$  the procedures are:

1. Select the entries  $\tilde{g}_{1,1}^t, \tilde{g}_{1,2}^t, \tilde{g}_{1,3}^t, \tilde{g}_{1,4}^t$  from the first column in  $\tilde{G}^t$  and insert these into the main diagonal cells  $\tilde{f}_{1,1}, \tilde{f}_{1,2}, \tilde{f}_{1,3}, \tilde{f}_{1,4}$  of  $\tilde{F}_1^c$  as shown below. For the  $\tilde{f}_{1,j}$  the superscript "c" is not shown since these elements are designated as belonging to the matrix  $\tilde{F}_1^c$  which carries that superscript in order to distinguish it as a *fuzzy construct matrix*.

$$\tilde{F}_1^c = \begin{bmatrix} 1.0 & & & \\ & 0.4 & & \\ & & 0.5 & \\ & & & 1.0 \end{bmatrix} \quad (4.14)$$

2. To fill the cells above the main diagonal in  $\tilde{F}_1^c$  do the following:

$$\tilde{f}_{1,2} = \text{MIN}(\tilde{g}_{1,1}^t, \tilde{g}_{2,1}^t), \tilde{f}_{1,3} = \text{MIN}(\tilde{g}_{1,1}^t, \tilde{g}_{3,1}^t), \tilde{f}_{1,4} = \text{MIN}(\tilde{g}_{1,1}^t, \tilde{g}_{4,1}^t) \quad (4.15)$$

$$\tilde{f}_{2,3} = \text{MIN}(\tilde{g}_{2,1}^t, \tilde{g}_{3,1}^t), \tilde{f}_{2,4} = \text{MIN}(\tilde{g}_{2,1}^t, \tilde{g}_{4,1}^t) \quad (4.16)$$

$$\tilde{f}_{3,4} = \text{MIN}(\tilde{g}_{3,1}^t, \tilde{g}_{4,1}^t) \quad (4.17)$$

The matrix  $\tilde{F}_1^c$  with the leading diagonal and cells above it filled is shown below.

$$\tilde{F}_1^c = \begin{bmatrix} 1.0 & 0.4 & 0.5 & 1.0 \\ & 0.4 & 0.4 & 0.4 \\ & & 0.5 & 0.5 \\ & & & 1.0 \end{bmatrix} \quad (4.18)$$

### Symmetric Fuzzy Matrices

The fuzzy matrices derived by this model are different to those used by Spillman, Spillman and Bezdek (1980). The interest in that work was in the preferences for  $n$  alternatives from a set of solutions,  $A$ . Each pair of alternatives  $(a_i, a_j)$  was considered in turn by each member of a group and the preferences  $p(a_i, a_j)$  were represented in a fuzzy relation matrix  $R_k, 1 < k \leq m$  where  $m$  represented the number of individual members in the group. The matrix  $R_k$  had the following properties:

$$\text{for } i = j, r_{i,j} = 0, 1 < i, j < n \quad (4.19)$$

$$r_{i,j} + r_{j,i} = 1, 1 \leq i \neq j \leq n \quad (4.20)$$

Thus, (4.19) means that each element on the main diagonal of  $\mathbf{R}$  had a zero coefficient. By virtue of (4.20)  $\mathbf{R}$  is said to be *reciprocal fuzzy relation matrix* (Spillman, Spillman & Bezdek 1980, p. 293). A hypothetical fuzzy relation matrix is shown below.

$$\tilde{\mathbf{R}} = \begin{bmatrix} 0.0 & 0.4 & 0.5 & 1.0 \\ 0.6 & 0.0 & 0.4 & 0.4 \\ 0.5 & 0.6 & 0.0 & 0.5 \\ 0.0 & 0.6 & 0.5 & 0.0 \end{bmatrix} \quad (4.21)$$

Earlier in this thesis it was argued that fuzzy construct subsets are complementary such that the membership value of elements in relation to the implicit pole are the complement of the membership values for the same elements in relation to the explicit pole (Gaines & Shaw 1980, p. 169). This is a logical extension of the binary valued distinctions employed by Kelly as expressed in the dichotomy corollary. The logic is accepted provided that constructs are meaningful dimensions. The reciprocal matrices devised by Spillman, Spillman and Bezdek (1980) were initially attractive as a vehicle for expressing the complementary nature of fuzzy construct subsets. However, in the current research it was decided to implicitly recognise this by focusing only on the membership values that relate to the explicit poles, as long as the construct poles constituted a meaningful dimension. Since meaningfulness is often idiosyncratic participant feedback was an important part of the interpretive process. Thus, the fuzzy matrices developed in the current research are not reciprocal but symmetric.

In contrast to Spillman, Spillman, and Bezdek (1980) the values on the main diagonal of the fuzzy construct matrices are not zero but represent the membership values for

the fuzzy construct subset under consideration. The elements in the off-diagonal positions show the extent of intra-construct intersection of membership values. This adds information by indicating how much differentiation there is in the membership values for a particular construct in relation to the elements being considered. The complete fuzzy construct matrix  $\tilde{F}_1^c$  is shown below.

$$\tilde{F}_1^c = \begin{bmatrix} 1.0 & 0.4 & 0.5 & 1.0 \\ 0.4 & 0.4 & 0.4 & 0.4 \\ 0.5 & 0.4 & 0.5 & 0.5 \\ 1.0 & 0.4 & 0.5 & 1.0 \end{bmatrix} \quad (4.22)$$

The remaining fuzzy construct matrices are shown below.

$$\tilde{F}_2^c = \begin{bmatrix} 0.5 & 0.5 & 0.5 & 0.1 \\ 0.5 & 0.6 & 0.6 & 0.1 \\ 0.5 & 0.6 & 0.8 & 0.1 \\ 0.1 & 0.1 & 0.1 & 0.1 \end{bmatrix} \quad (4.23)$$

$$\tilde{F}_3^c = \begin{bmatrix} 1.0 & 0.1 & 0.4 & 0.9 \\ 0.1 & 0.1 & 0.1 & 0.1 \\ 0.4 & 0.1 & 0.4 & 0.4 \\ 0.9 & 0.1 & 0.4 & 0.9 \end{bmatrix} \quad (4.24)$$

$$\tilde{F}_4^c = \begin{bmatrix} 1.0 & 0.8 & 0.6 & 1.0 \\ 0.8 & 0.8 & 0.6 & 0.8 \\ 0.6 & 0.6 & 0.6 & 0.6 \\ 1.0 & 0.8 & 0.6 & 1.0 \end{bmatrix} \quad (4.25)$$

Procedure 3 employs decomposition to generate hard  $\alpha$ -level construct matrices  $H_{k,\alpha}^c$ . The number of such matrices generated from each fuzzy construct matrix depends on the granularity of the alpha cuts. For example, if an alpha cut of 0.1 is used on [0,1] then the number of hard alpha level matrices generated for each fuzzy construct matrix is eleven. If the alpha cut is 0.01 then the number is one hundred



and one. For ease of exposition, an alpha cut of 0.25 will be used to demonstrate the application of the model to the current example. The hard matrix for  $\alpha_1 = 0.00$  is not shown since all the elements are always 1.00 in such a matrix. This means that in terms of calculations this matrix can be treated as a constant as is shown in Equation (4.11).

The hard alpha level construct matrices are shown below.

$$H_{1,0.25}^c = \begin{bmatrix} 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \end{bmatrix} \quad (4.26)$$

$$H_{2,0.25}^c = \begin{bmatrix} 1.0 & 1.0 & 1.0 & 0.0 \\ 1.0 & 1.0 & 1.0 & 0.0 \\ 1.0 & 1.0 & 1.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \end{bmatrix} \quad (4.27)$$

$$H_{3,0.25}^c = \begin{bmatrix} 1.0 & 0.0 & 1.0 & 1.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \\ 1.0 & 0.0 & 1.0 & 1.0 \\ 1.0 & 0.0 & 1.0 & 1.0 \end{bmatrix} \quad (4.28)$$

$$H_{4,0.25}^c = \begin{bmatrix} 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \end{bmatrix} \quad (4.29)$$

For a given alpha level, Procedure 4 involves the comparison of each of the hard matrices with one another in order to determine the level of agreement between them. The objective is to establish the level of agreement between each construct pair.

A comparison of the hard matrices  $H_{1,0.25}^c$  and  $H_{2,0.25}^c$  is shown below.

$$H_{1,0.25}^c = \begin{bmatrix} 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \\ 1.0 & 1.0 & 1.0 & 1.0 \end{bmatrix} \quad (4.30)$$

$$H_{2,0.25}^c = \begin{bmatrix} 1.0 & 1.0 & 1.0 & 0.0 \\ 1.0 & 1.0 & 1.0 & 0.0 \\ 1.0 & 1.0 & 1.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \end{bmatrix} \quad (4.31)$$

$$\begin{aligned} A[H_{1,0.25}^c, H_{2,0.25}^c] &= \frac{\text{tr} \left[ H_{1,0.25}^c (H_{2,0.25}^c)^t \right]}{\text{tr} \left[ H_{1,0.25}^c (H_{1,0.25}^c)^t \right] + \text{tr} \left[ H_{2,0.25}^c (H_{2,0.25}^c)^t \right] - \text{tr} \left[ H_{1,0.25}^c (H_{2,0.25}^c)^t \right]} \\ &= \frac{9}{16 + 9 - 9} \\ &= 0.56 \end{aligned} \quad (4.32)$$

The second step in Procedure 4 is to record the agreement coefficients for each matrix pair in an alpha level consensus matrix  $C_{\alpha_i}^c$ . The  $C_{0.25}^c$  matrix for the four constructs under consideration is shown below.

$$C_{0.25}^c = \begin{bmatrix} 0.00 & 0.56 & 0.56 & 1.00 \\ 0.56 & 0.00 & 0.29 & 0.56 \\ 0.56 & 0.29 & 0.00 & 0.56 \\ 1.00 & 0.56 & 0.56 & 0.00 \end{bmatrix} \quad (4.33)$$

Procedure 5 uses the values in the alpha level consensus matrix to generate a measure of the alpha level consensus  $K_{\alpha_i}^c$ . This is an overall measure of the level of

agreement between the constructs at a particular alpha level. In essence this is an averaging procedure but geometric rather than arithmetic. Since the consensus matrix is squared in the procedure, the resulting consensus measure is more conservative than it would be if the elements in  $\mathbf{C}_{\alpha_i}^c$  were summed and the arithmetic mean calculated. For this example:

$$\begin{aligned} K_{\alpha_{0.25}}^c &= \frac{\text{tr}(\mathbf{C}_{\alpha_{0.25}}^c)^2}{4(4-1)} \\ &= \frac{4.68}{12} \\ &= 0.39 \end{aligned} \quad (4.34)$$

In other words at  $\alpha_2 = 0.25$ , the constructs exhibit considerable difference in that they are applied to the politicians. Notable in the results displayed in the consensus matrix is the apparent similarity between the construct one *arrogant* construct four *capitalist* *focused* as they have been applied to the politicians in question,

$$A(\mathbf{H}_{10.25}^c, \mathbf{H}_{40.25}^c) = 1.00.$$

The procedures discussed thus far are repeated for each alpha level to generate the consensus matrices, estimates of the alpha level consensus and the similarity of construct pairs. For the current example this means repeating the procedures another three times at alpha levels of  $\alpha_3 = 0.50$ ,  $\alpha_4 = 0.75$  and  $\alpha_5 = 1.0$ . Once this is done a global measure of construct consensus can be derived as well as global estimates of the similarity of the construct pairs. For this example  $K_{0.50}^c$ ,  $K_{0.75}^c$ ,  $K_{1.0}^c$

are 0.16, 0.23 and 0.19 respectively. Using Procedure 7 the estimate of the global consensus between the constructs is:

$$\begin{aligned}
 K_G^c &= \sqrt{\frac{1}{2I} \left( K_{a_0}^c + 2K_{a_1}^c + 2K_{a_2}^c + \dots + K_{a_I}^c \right)} \\
 &= \sqrt{\frac{1}{8} \left( 1 + 2 \cdot 0.39 + 2 \cdot 0.16 + 2 \cdot 0.23 + 0.19 \right)} \\
 &= 0.59 \tag{4.35}
 \end{aligned}$$

Table 4.3 below indicates the overall similarity between the construct pairs when represented as fuzzy construct subsets.

**Table 4.3: Similarity Matrix for Construct Pairs**

Constructs	Arrogant	Shrewd	Rude in public	Capitalist Focus
Arrogant	0.00	0.47	0.72	0.79
Shrewd	0.47	0.00	0.38	0.53
Rude in Public	0.72	0.38	0.00	0.53
Capitalist Focus	0.79	0.53	0.53	0.00

It would appear that from the participant's point of view *arrogance*, *rudeness in public* and a *capitalist focus* have much in common.

### Generating Similarity Measures for Elements

In deriving the model, the aim was to formulate an analytical method that could also be applied to the elements in any grid.

The procedures for generating the similarity measures for the elements are explained below.

Let  $C$  be the set of  $m$  constructs used to describe the set of  $n$  elements in  $E$ .

$$C = \{c_1, c_2, \dots, c_m\} \quad (4.36)$$

Using the term "set" as a descriptor for  $C$  implies completeness and sufficiency. In practice the number and type of constructs that relate to a specific context is unknown. Elicited constructs are a sample from a 'construct repertoire' (Slater 1976, p. 27). Moreover, age, education, life experience and socioeconomic status are all factors to be taken into consideration when deciding eliciting constructs. Laird (1983, p.3) said that 'like clocks, small-scale models of reality need neither be wholly accurate nor correspond completely with what they model in order to be useful'. Slater (1977, p. 31) suggested ten as the minimum number of constructs necessary to 'sustain idiographic conclusions independently of other sources of information'. The repertory grids elicited for each of the three contexts investigated in the current research comprised eight elements and eight constructs. The slightly reduced size was an accommodation to the cognitive demands of the elicitation process on participants who were required to provide three grids, and time constraints. These matters are discussed in more detail in chapters 5 and 6.

A *fuzzy element subset*  $\tilde{E}_j$  of  $C$  is a set of ordered pairs:

$$\tilde{E}_j = \left\{ \left( c_i \mid \mu_{\tilde{E}_j}(c_i) \right) \right\} \forall c_i \in C, 0 < i \leq m, 0 < j \leq n \quad (4.37)$$

Such a fuzzy subset indicates the way in which element  $e_j$  is construed, in terms of the constructs  $c_i$ . Referring again to the example of the four politicians,  $\tilde{E}_1$  is the fuzzy element subset, which indicates how politician  $e_1$  is construed. This fuzzy subset is shown below.

$$\tilde{E}_1 = \left\{ c_1^{\text{arrogant}} = 1.0, c_2^{\text{steward}} = 0.5, c_3^{\text{rude in public}} = 1.0, c_4^{\text{conspicuous focus}} = 1.0 \right\} \quad (4.38)$$

The procedures of the FUZZY-PCP model as they are applied to the elements are set out below.

#### Procedure 1

For any fuzzy grid  $\tilde{G}$  excise each column and create  $n$  fuzzy element matrices  $\tilde{F}_k^e$ ,  $1 < k \leq n$ , where  $n$  is the number of columns in  $\tilde{G}$ .

Each  $\tilde{F}_k^e$  matrix is  $(m \times m)$  where  $m$  is the number rows in  $\tilde{G}$ , with elements

$$\left( \tilde{F}_k^e \right)_{i,j} = \begin{cases} \tilde{g}_{i,j} & , \quad \text{if } i = j \\ \text{MIN} \left( \tilde{g}_{i,k}, \tilde{g}_{j,k} \right) & , \quad \text{if } i \neq j \end{cases} \quad (4.39)$$

This is the same procedure as that used to generate the fuzzy construct matrices.

Consider the fuzzy element subset  $\tilde{E}_1$ . Using (4.38) the fuzzy element matrix  $\tilde{F}_1^e$  is:

$$\tilde{F}_1^e = \begin{bmatrix} 1.0 & 0.5 & 1.0 & 1.0 \\ 0.5 & 0.5 & 0.5 & 0.5 \\ 1.0 & 0.5 & 1.0 & 1.0 \\ 1.0 & 0.5 & 1.0 & 1.0 \end{bmatrix} \quad (4.40)$$

## Procedure 2

Use decomposition to create *hard element matrices*  $\mathbf{H}_{k,\alpha_l}^e$  such that:

$$\left(\mathbf{H}_{k,\alpha_l}^e\right)_{i,j} = \begin{cases} 0 & \text{if } \left(\tilde{f}_k^e\right)_{i,j} < \alpha_l \\ 1 & \text{if } \left(\tilde{f}_k^e\right)_{i,j} \geq \alpha_l \end{cases}$$

$$0 < k \leq n, 0 \leq \alpha_l \leq 1, 0 < l \leq q, 0 < i, j \leq m \quad (4.41)$$

Thus, at each alpha level  $n$ , hard  $m \times m$  matrices are created whose elements are  $\{0,1\}$  except in the case of the  $\mathbf{H}_{k,0,0}^e$  which comprises only unit entries.

## Procedure 3

a) First, compare all of these hard matrices pairwise in order to determine the level of agreement between them. For  $0 < k, k' \leq m, k \neq k'$  define the agreement measure

$$A\left[\mathbf{H}_{k,\alpha_l}^e, \mathbf{H}_{k',\alpha_{l'}}^e\right] \text{ as:}$$

$$A\left[\mathbf{H}_{k,\alpha_l}^e, \mathbf{H}_{k',\alpha_{l'}}^e\right] = \frac{\text{tr}\left[\mathbf{H}_{k,\alpha_l}^e, \left(\mathbf{H}_{k',\alpha_{l'}}^e\right)^t\right]}{\text{tr}\left[\mathbf{H}_{k,\alpha_l}^e, \left(\mathbf{H}_{k,\alpha_l}^e\right)^t\right] + \text{tr}\left[\mathbf{H}_{k',\alpha_{l'}}^e, \left(\mathbf{H}_{k',\alpha_{l'}}^e\right)^t\right] - \text{tr}\left[\mathbf{H}_{k,\alpha_l}^e, \left(\mathbf{H}_{k',\alpha_{l'}}^e\right)^t\right]} \quad (4.42)$$

b) Second, display the results in an *Alpha Level Construct Consensus Matrix*  $C_{\alpha_l}^e$ .

$$\left(C_{\alpha_l}^e\right)_{i,j} = \begin{cases} A\left[H_{k,\alpha_l}^e, H_{k',\alpha_l}^e\right] & i=j \\ 0 & i \neq j \end{cases} \quad (4.43)$$

#### Procedure 4

Calculate and estimate of the *Alpha Level Element Consensus* using:

$$K_{\alpha_l}^e = \frac{\text{tr}\left(C_{\alpha_l}^e\right)^2}{n(n-1)}, \quad 0 \leq \alpha \leq 1, 0 < l \leq q \quad (4.44)$$

Recall that  $n$  is the number of hard matrices under consideration.

#### Procedure 5

Repeat procedures three and four until consensus estimates  $K_{k,\alpha_l}^e$  have been calculated at each alpha step.

#### Procedure 6

a) First calculate a global estimate of the consensus between the elements  $K_G^e$  using

$$K_G^e = \sqrt{\frac{1}{2l}\left(K_{\alpha_1}^e + 2K_{\alpha_2}^e + 2K_{\alpha_3}^e + \dots + K_{\alpha_q}^e\right)}, \quad K_{\alpha_1}^e = 1 \quad (4.45)$$

For the current example the estimate of element consensus is

$$\begin{aligned} K_G^e &= \sqrt{\frac{1}{8}\left(1 + 2 \cdot 0.39 + 2 \cdot 0.16 + 2 \cdot 0.17 + 0.03\right)} \\ &= 0.56 \end{aligned} \quad (4.46)$$



b) Second, calculate a measure of the *Global Pairwise Agreement* of the constructs,

$A_G[H_k^e, H_k^e]$  using:

$$A_G[H_k^e, H_k^e] = \frac{1}{2l} \left( A[H_{k\alpha_1}^e, H_{k'\alpha_1}^e] + 2A[H_{k\alpha_2}^e, H_{k'\alpha_2}^e] + 2A[H_{k\alpha_3}^e, H_{k'\alpha_3}^e] + \dots + A[H_{k\alpha_q}^e, H_{k'\alpha_q}^e] \right) \quad (4.47)$$

$A_G(H_k^e, H_k^e)$  indicates the similarity of the element pairs.

Shown below is a matrix that indicates the global level of agreement between the element pairs for the grid shown in Table 4.1.

Table 4.4: Similarity Matrix for Element Pairs

Politicians	$e_1$	$e_2$	$e_3$	$e_4$
$e_1$	0.00	0.47	0.67	0.75
$e_2$	0.47	0.00	0.50	0.39
$e_3$	0.67	0.50	0.00	0.47
$e_4$	0.75	0.39	0.47	0.00

It may be seen that in terms of the constructs politicians one and four are construed as being quite similar whilst politicians two and four are construed as quite different.

### An Overview of FUZZYGRID

For any but the smallest grids the number of matrix manipulations required to generate results becomes very large. For the constructs the number of matrix multiplications required, excluding those that relate to the consensus matrices  $C_{\alpha_i}$ , is  $\frac{m!}{x!(m-x)!} \times q$ .

(where  $x = 2$  the number of constructs compared at any one time, and  $q$  is the number of *alpha cuts*). For example, if  $\tilde{G}$  has eight rows and  $q = 10$ , then the number of matrix multiplications required would be two hundred and eighty. The number of the calculations is the same for the columns (elements) when  $\tilde{G}$  is square. Therefore, it was necessary to automate the model procedures. Lotus 123 and Excel were considered as platforms. However the recursive nature of the model required that a purpose built software program be created. This was done and the model procedures have been incorporated in a software program named FUZZYGRID. FUZZYGRID allows the matrix transformations and multiplications to be done quickly and accurately.

As output FUZZYGRID provides consensus values at each  $\alpha_i$  for the constructs and the elements,  $K_{\alpha_i}^c$  and  $K_{\alpha_i}^e$ , respectively. A global measure of construct relatedness  $K_G^c$  and a global measure of element relatedness  $K_G^e$  is also produced. Two similarity matrices are produced one whose elements show the similarity of the construct pairs  $A_G \begin{bmatrix} H_k^c & H_{k'}^c \end{bmatrix}$  and another whose elements show the similarity of the element pairs  $A_G \begin{bmatrix} H_k^e & H_{k'}^e \end{bmatrix}$ . Dissimilarity matrices for the constructs and the elements are also produced. These dissimilarity matrices can be exported to SPSS as input for a multidimensional scaling analysis of the constructs and the elements.

Sample output for FUZZYGRID is presented in appendix II. The output is based on the data from Example 4.1.

## Conclusion

This completes the presentation of the basic model. In summary the derivation of the model achieves two aims. Firstly, employing fuzzy sets for representing constructs approximates more closely the way in which people construe the world. Commentating on the distinction between Aristotelian logic and construing Slater (1976, p. 35) said:

'S is P' is an objective statement while 'E can be construed as C' is subjective. Valid reasoning or sufficient evidence may prove in particular instances that the proposition 'S is P' is true or false beyond all possible doubt whatever. If it is not meaningless, its truth-value can only be 1 or 0 in every instance, although which [sic] may be uncertain for lack of conclusive proof. On the other hand 'E can be construed as C' only connects E and C within some real or imaginary personal construct system. Every entry in a grid is the numerical formulation of a proposition, which has some psychological meaning for the informant. It cannot be rejected as a datum on the grounds that it is untrue.

Similarly Fuzzy-Set theory is not concerned with truth or falsity as determined by some objective benchmark, nor does it address probability considerations. These are also irrelevant to the constructivist view of psychology. Fuzzy-Set theory is sympathetic to the psychological meaning which people attach to objects, people and situations by way of their personal constructs. Fuzziness makes explicit that whilst people may be resolute about some things, they are not generally so inclined.

Secondly, the model exploits the duality of the repertory grid. This enables the configuration of constructs to be examined with the elements as background and, conversely the configuration of the elements to be examined with the constructs as background. This approach resembles the way duality has been applied in Economics and Operations Research. Exploiting the duality of the repertory grid extends the work of Kelly whose principal focus was on the patterning of the constructs and their meaning. The extension improves the versatility of the grid as an investigative tool. For example, the type and patterning of constructs which a person may use to describe others can be examined. On the other hand interest might be centered on the way in

which those others appear to be related to each other and whether it is possible to define subgroups in terms of the constructs used.

This chapter completes part one of this thesis. Chapter 5, which begins part two, explains how the research design was developed and refined.

## **PART TWO – THE EMPIRICAL STUDIES**

## CHAPTER 5

### THE RESEARCH DESIGN

#### Introduction

The first part of this thesis was structured to review the theory of PCP and to propose a new methodological approach that is represented in the FUZZY-PCP model. However, to operationalise the model and test its efficacy real data related to the context of the current research were required. Part two of this thesis demonstrates how this was achieved. This chapter explains the research design used for the fieldwork, the ethical standards that were established to govern the conduct of the research, and the method and protocols used to enlist participants. Whilst the detail of the questionnaires employed in the interviews is presented in this chapter the detailed specification of the repertory grids is reserved for chapter 6. The reason for this is that the repertory grids were trialled and considerably modified during the course of the pilot study. Therefore, the discussion of this development work is presented in the context of the case studies that were used for that purpose. Thus, the work presented in this chapter and that in chapter 6 provide the basis for the remaining material presented in this thesis.

The research question was:

***To investigate how men construe both work and nonwork as well as their behaviour in these domains during the transition to fatherhood.***

## The Research Design

### Multiple Case Studies

Given the philosophy and the theoretical basis of the current research a large sample nomothetic methodology would have been incongruous. Thus, the idiographic approach was housed within a multiple case study framework. Random selection was neither necessary nor preferable (Eisenhardt 1989, p. 537). However, as will be demonstrated, participants were not selected on an ad-hoc basis but in concert with a *replication logic* upon which the current research was premised.

Replication logic advocates that cases selected for inclusion in a study are *literal* replications such that they are expected to yield similar results. Individual cases are whole studies in which 'convergent evidence is sought regarding the facts and conclusions for the case; each case's conclusions are then considered to be information needing replication by other individual cases' (Yin 1989, p.57). However, other cases can also be selected which yield contrary results but for predictable reasons. Such cases are known as *theoretical* replications (Yin 1989, p. 53). Whilst the selection criteria used in the current research primarily reflected a deliberate attempt to select cases which were expected to yield literal replications, they were also relaxed to allow theoretical replications to be achieved. This permitted insights to be generated from the contrasting results emanating from those cases. Following (Eisenhardt 1989, p. 540) individual cases were written up in detail to assist in organising large volumes of data. Cross case comparisons were more easily achieved when each case had been resolved as an individual entity.

## Selecting Participants

*Purposive Judgment Sampling* (Sekaran 1992, p. 235) was the method used to select participants. Six criteria were used to give effect to this. Whilst the emphasis was on obtaining a homogeneous participant group, those who did not satisfy all of the guidelines were not necessarily excluded from the research. This was in keeping with the objective of securing theoretical as well as literal replications in the research. The selection criteria are described and explained below.

1. *Age of participant and partner.* Preferably in the age range 28 to 35 years. Traditionally the transition to fatherhood has occurred within the structure-building period of the early adult era estimated to be in the age range 22 to 28 years (Levinson 1976, p. 18). However, the synchronisation of marriage, career establishment and parenthood is not as widespread today as it has been. It is quite common for couples to delay having children until they have established their careers and secured their financial position. In 1992 men aged 30 years or more at first marriage represented 42% of all men marrying. In 1982 this percentage was 31 and only 17% in 1972. In 1992 31% of women who married for the first time were aged 30 years or more. This contrasts markedly with the statistics for 1982 and 1972, which were 21% and 11% respectively (ABS 1993, p. 1). The median age at first marriage for males rose from 25.4 in 1985 to 27.3 in 1995. For females the median age at first marriage rose from 23.2 to 25.3 over the same period (ABS 1997, p. 24).

In 1982 the median age of mothers at *nuptial first confinement* was 25.5 years. By 1992 this had risen to 28 years (ABS 1994, p. 33). In 1996 the median age of women at nuptial first confinement was 28.7 years. A nuptial first confinement is the first



confinement, in the current marriage and does not necessarily represent the woman's first ever confinement resulting in a live birth (ABS 1997, p. 71). However, notwithstanding this limitation in the statistics reported here there is a clear trend towards delaying the birth of the first child. In the period 1976 to 1996 the median age of mothers at first nuptial confinement rose by 4.5 years (ABS 1997, p. 21). Ultimately those who volunteered to participate in the current research reflected this trend. However, some younger participants were also selected for participation in the present study in the expectation that they would have profiles that were different to those in the older age group.

2. *Occupational Status of Each Partner.* Professional, as specified in the *Australian Standard Classification of Occupations* (ABS, 1990). The gap between the proportions of women and men who are degree qualified has been closing in recent years. In 1993, 9% of women and 11% of men aged 15-69 years were degree qualified compared with 5% and 9% respectively in 1984. In 1993 the proportion of women and men in the age range 25 to 34 years who were degree qualified was almost identical, 13<sup>1/2</sup> % of men and 13% of women (ABS 1994, p. 90). In 1996 the proportion in this age range who had post-school qualifications such as a trade qualification, certificate diploma or degree was 54.4% and 45.9% for men and women respectively (ABS 1994, p. 90). A direct corollary of the increasing proportion of women pursuing higher education is the increase in the number of couples where both partners are qualified and pursuing professional careers. Rapoport and Rapoport (1976, p. 9) defined a career as job sequences that require a high degree of commitment and have a continuous developmental character. Whilst many non-career jobs may be performed with a high degree of commitment it is the developmental aspect which differentiates a career. Careers are intrinsically

demanding. The potential for conflict between career and family may be increased during the transition to parenthood. Thus couples in which both partners were professionals were targeted to determine what accommodations were made and who made them after the birth of the first child.

3. *Marital Status and Relationship Duration.* In 1996, 27% of all births were to women who were not in a registered marriage. The percentage of births occurring outside a registered marriage was 17% and 10% in 1976. The proportion of births in which paternity was not acknowledged was 4.3% in 1996 (ABS, 1997, p. 21). Thus it may be conjectured that having children and the responsibility for parenting is no longer universally tied to the institution of marriage.

Rusbult (1980, p. 175) described relationship commitment as a function of the outcome value of the current relationship plus the value of investments already made minus the value of the next best alternative to the current relationship. Scanlon et al. (1993, p. 4) reported that Rusbult's model had proven effective in predicting commitment to romantic relationships and to friendships. Building on the work of Rusbult (1980, 1983) Scott, Stanley and Markman (1992, p. 595) defined relationship commitment as comprising two related constructs, personal dedication and constraint commitment. Personal dedication comprises the desire to maintain and improve the quality of a relationship for the joint benefit of participants. Constraint commitment refers to the forces that constrain individuals to maintain relationships regardless of their personal dedication. Marriage is a public sign of personal dedication that also gives rise to specific rights and responsibilities that are enforceable at law. However, in Australia rights and responsibilities which were formerly a consequence of marriage now also arise and are enforced in relationships where a couple are

cohabiting. This was one of the legislative initiatives codified in the Family Law Act (1976) (Edgar 1995, p. 12). Thus, from a legal perspective constraint commitment is not a function of marital status but of cohabitation.

Social and psychological factors may influence personal dedication but also constrain a person in a relationship. Whilst their influence may be more pronounced on a person who is married, there is no reason to presume that they arise only as a consequence of marriage itself.

Waller (1938) wrote that 'marriage is the remedy for love'. He was referring to the adjustment process following marriage in which the 'real person and the reality of marriage pound at the portals of thought' (Waller 1938, p. 312). However Huston, Mchale and Crouter (1986, p. 311) found that the duration of cohabitation may have an effect on the adjustment to marriage such that the adjustment to marriage may be greater if the period of prior cohabitation has been short. Thus, in the current research couples had to have cohabited for at least one year to be eligible for the study. The duration of cohabitation not marriage per se was used as the selection criteria for married and unmarried couples.

4. *First Marriage*. If married then married for the first time. This criterion was imposed to control for influences arising from a previous marital relationship which may have emerged during the transition to parenthood. A limitation of this criterion was that there was no control for people who may have cohabited with another prior to marriage.

5. *First Baby*. The baby must be the first for both partners. The transition to parenthood is a unique experience at the level of the individual and the couple. Therefore, it was mandatory that both partners be expecting their first child.

6. *Last Trimester of Pregnancy*. Only couples in which the pregnancy had progressed to the last trimester were eligible for participation. This criterion was applied to minimise the likelihood of encountering a couple in which there had been complications during the pregnancy.

### **The Unit of Analysis**

In conformity with the statement of the research problem the individual was the primary unit of analysis (Yin 1989, p. 31). Without compromising this, descriptive data and the results of standard statistical tests have been reported at the level of the participant group (Babbie 1992, p. 92). The research would have been strengthened had it been possible to interview both partners. This would have presented opportunities for triangulation and insights from the female partner would have added depth to the research. However, as will be explained below ethical considerations precluded this.

### **The Time Horizon**

Whilst the birth of a baby is a culminating event of relatively short duration it is the tangible outcome of a transition process begun some time earlier. Therefore, with the exception of the preliminary interviews conducted early in the period of the research the field research was longitudinal. Initially it was envisaged that each participant could be interviewed on three occasions, once before the birth, six months afterwards, and subsequently about twelve months after the birth. However, it became clear during the recruitment process that people were comfortable with two meetings but that three was

an unattractive proposition. It also became evident that three interviews with each person may not have been feasible given the time frame allotted for the fieldwork. Therefore, every participant was interviewed twice in person, shortly before the birth of the baby and again six months or more afterwards. It was determined that six months was sufficient time to allow for the initial adjustment to parenthood but not too long in terms of the recollection of events following the birth of the baby.

### **The Organisation of the Field Research**

The field research was organised as two longitudinal overlapping studies comprising a pilot study and the main study. The first round of interviews for pilot study was used to pilot the first questionnaire, develop the ultimate configuration for the three repertory grids used, and trial and modify the elicitation method. Thus, when the first round of interviews for the main study was commenced extensive pilot testing of the research instruments had been conducted and the appropriate revisions made. Similarly the second round of interviews in the pilot study was used to pilot the second questionnaire and investigate the possibility of developing a fourth repertory grid relating to the early experience of fatherhood. Thus, when the second round of interviews for the main study was commenced the instruments used there had also been refined.

The questionnaires were also pilot tested with a number of individuals who were not participants in the research. This meant that the revisions to the questionnaires as a result of field-testing were minimal. For this reason it was possible to collect an extensive amount of data from the questionnaires administered in both studies and subsequently combine these to produce summary data as well as test a number of hypotheses.

### **The Number of Participants**

A judgment was made that ten interviews would be a sufficient number for the pilot study. Any glitches in the process of recruitment and in the conduct of the interviews could be ironed out. Ten interviews would permit sufficient scope to develop, review and refine the style of interviewing. By interacting with participants during the pilot study a fuller understanding of the work, nonwork, health and relationship issues arising from the transition experience would be realised.

For the main study it was decided that 20 would be a sufficient and manageable number of participants given the time which had been allotted for the conduct of the field research.

### **The Research Setting**

The setting for the research was non-contrived. Most of the research was conducted in the participants' homes usually after hours on a weeknight. Four participants were interviewed at their place of work.

### **Data Collection**

As discussed in chapter 2 a decision was made to employ the repertory grid as the means of eliciting constructs from participants. Eden (1993, p. 3) said that 'the ability to elicit *idiographic* data from respondents is important so that full recognition is given to the idiosyncratic ways in which each of the research subjects views their world'. When applied in the spirit of Kelly (1955) the repertory grid achieves this. However, when this approach is followed the comparison of individual grids can be difficult. Thus, there is a temptation to attempt to standardise instruments by supplying elements and or

constructs for ease in cross case comparisons. However, this can result in the treatment of data as if they were nomothetic.

In some cases the need for direct comparison of individual maps ... results in the data ignoring the requirement of allowing the idiosyncrasy upon which the research results depend (Eden 1993, p. 3).

This issue was evaluated before committing to the repertory grid. Ultimately it was decided to give precedence to idiosyncrasy. As was demonstrated in chapter 2 a basis for inferring form and interpreting the content of cognitive structures had been resolved. This addressed Eden's (1993, p. 3) criticism that methods for the comparison of cognitive structures had been preoccupied with structural measures of form whilst ignoring the 'arguably more difficult, problem' of assessing content or meaning.

Eden (1993, p. 4) said that meaning derives from:

- i. the words that make up a construct which may form part of a *public* vocabulary;
- ii. the contrasting pole in a construct, and most significantly;
- iii. the context of the construct within the map.

In recognition of point (iii) the repertory grids used to collect data were related to specific contexts. These contexts were made plain to participants prior to the elicitation of constructs. This demarcation of contexts facilitated the process of cross case analysis. This and other issues that affected the ultimate configuration of the repertory grids used in the current research are discussed in depth in the next chapter.

### **The First Questionnaire**

This questionnaire was organised in three sections.

*Section One.* Section 1 contained questions pertaining to age, occupation, education and job status of both the participant and his partner. Specific questions were asked in relation to the number of hours worked in a normal week including work done at home. Participants were asked to indicate the extent to which they worked on weekends,

whether at work or at home. Responses were elicited on satisfaction and commitment to job, occupation and organisation. A number of questions sought responses in relation to the return to work of the participant's partner following the birth of the baby. The participant was asked to indicate whether he intended to take any extended break from work immediately following the birth of the baby.

*Section Two.* Section 2 addressed issues related to the participant's perception of self, nonwork and relationship issues and contained sixteen questions. Participants were asked to respond to the question Who am I? by writing down five words or phrases which came to mind. The intention was to relate the response to this question to the constructs elicited with the repertory grids.

The instructions at the beginning of section 2 defined 'work' as paid employment and non-work as 'anything outside your paid employment including household activities, shopping, and those activities that you regard as leisure'. Participants were subsequently asked to describe the similarities between work and nonwork, and to define leisure from their own point of view. Participants were asked to rate their level of satisfaction with the amount of time, which they had to pursue individual and couple related nonwork activities.

Data were sought on relationship duration. This was viewed as an important benchmark against which the transition to fatherhood could be evaluated. Data were also sought on the couple relationship in terms of three attributes — romance, friendship and partnership. The expectation was, that for couples who were managing the transition well, partnership would emerge as a more important aspect of the couple relationship following the birth of the baby.



A series of questions were asked about the allocation of household work in terms of those activities traditionally regarded as feminine — washing, ironing, cleaning, shopping and cooking, and those traditionally regarded as masculine — gardening, and house maintenance. Participants were asked to indicate the frequency with which they had participated in each of the nominated activities over the previous two-week period. Three questions were asked about who was responsible for budgeting, paying bills and negotiations with external agencies such as Banks and Local Councils. Participants were asked to indicate on a five point Likert scale how satisfied they were with the way that the household work was divided. If data on the contribution of the partner to unpaid domestic work and her level of satisfaction with the division of labour had been collected then this important aspect of the research could have been more thoroughly investigated. However, as mentioned ethical constraints did not permit data to be collected from partners.

*Section Three.* Data were collected on personality characteristics and relationship satisfaction. Instrumental and affiliative characteristics were measured using the *Personal Attributes Questionnaire* (PAQ) (Spence and Helmreich, 1978). A technique known as the median split method (Spence and Helmreich 1978, pp. 35–6) was used to classify participants as typical of one of four mutually exclusive categories. These categories were masculine, feminine, androgynous and undifferentiated. Table 5.1 below shows the breakpoints that were used.

**Table 5.1: Median Breakpoints for Masculinity and Femininity Scale**

Masculinity/Femininity <sup>(a)</sup>	Above Median	Below Median
Above Median	Androgynous	Feminine
Below Median	Masculine	Undifferentiated

(a) The columns relate to the masculine subscale for which the median breakpoint is 20. The rows relate to the femininity subscale for which the median breakpoint is 23.

Attitudes towards women were measured using the *Attitudes Towards Women Scale* (AWS) (Spence and Helmreich, 1978). The maximum score on this index was 45. High scores were interpreted as indicative of a progressive attitude towards women. Relationship satisfaction was measured using the Marital Relations Scale (Huston, McHale & Crouter, 1986). In addition, responses were sought on career salience, job and relationship needs and needs as a father. Participants were also asked to indicate whether the baby had been planned and what changes they anticipated following the birth. It was determined that it was important to ask whether a conscious decision was made to have a child since this may have been an indicator of the ease or difficulty of the transition to fatherhood. In the case where a baby was not planned the participant may not have been *psychologically ready* for the adjustment thus making the transition more difficult. The term psychological readiness is employed here to indicate that financial, career, relationship and personal factors are all implicated in the adjustment to parenthood.

### **The Second Questionnaire**

The second questionnaire also comprised three sections.

*Section One.* In section 1 questions sought follow up data on hours of paid work for the participant and his partner, and job, organisation, and occupational satisfaction and commitment.

*Section Two.* In section 2 follow up data were also collected on satisfaction with the amount of time which the participant had available for individual and couple related activities, relationship characterisation and the household division of labour.

*Section Three.* In section 3 the salience of work and nonwork roles was measured using the *Life Role Salience Scales* (LRSS) (Amatea, Cross, Clark & Bobby 1986). Relationship satisfaction was measured again with the *Marital Relations Scale* (Huston, McHale & Crouter, 1986). Participants were asked to describe the changes, which had occurred in their life since the birth of the baby. Specific questions about the extent to which the participant was involved in baby care and play were asked. In addition, participants were asked to indicate the extent to which they provided their partner with respite from caring from the baby.

### **Parenting Stress**

Scores on the subscales of the *Parenting Stress Index* (Abidin 1983) were used to measure feelings of reinforcement from and attachment to the baby, perceptions of the baby's mood and adaptability, parental competence, perceptions of restrictions and isolation, spouse relations and parental health. The total score on the index was used as a global measure of parenting stress. High subscale scores and high total scores were interpreted as indicating high stress levels. However, Abidin (1983, p. 28) stressed that the 'interpretations suggested should be viewed as working hypotheses, the validity of which will need to be established by further enquiry with any particular client'. Thus, in the current research indicators of parenting stress were interpreted with due regard to other indications emanating from the interview data.

Not all of the subscales were used in the current research. Minor alterations were made to some of the others by eliminating items that related more to children rather than to infants. To account for this pro-rata adjustments were made to the benchmark scores suggested by Abidin (1983, pp. 28-35). Table 5.2 shows these benchmarks and the adjustments made to them.

**Table 5.2: Benchmarks for Parenting Stress Index**

Domain/Benchmarks	Suggested	Adjusted <sup>(a)</sup>
<i>Child Characteristics</i>		
Parent reinforcement	12	10*
Child Mood	13	13
Child adaptability	31	31
High domain score	56	54*
<i>Parent Characteristics</i>		
Competence	37	31*
Attachment	16	14*
Restrictions	26	26
Isolation	18	18
Spouse relations	23	23
Parental health	16	16
High domain score	136	128*
High score for Parenting Stress Index	192	182*

(a) Adjusted scores are marked with an \*.

Abidin (1983, p. 29) said that 'research experience' had shown that extremely low total scores should be carefully investigated since they 'may be related to dysfunction'. He reported that two types of 'false negatives' had been identified.

*Type 1 False Negative.* Parents may be 'defensive' or 'fearful' and thus tend to mask their difficulties resulting in low total scores.

*Type 2 False Negative.* Parents who are minimally involved with their children with little involvement in the role of parent may record low scores.

Scores above 260 on the PSI suggest significant parenting stress. However Abidin (1983, p. 28) suggested that those whose total score on the index was below 175 should be carefully investigated to determine if this was a false negative attributable to either one of the reasons mentioned above. In the current research total scores on the PSI below 122 were investigated to determine if they were false negatives. This

reflected the elimination of some subscales and the adjustments that were made to others by eliminating certain items.

In summary, the questionnaires were structured to collect longitudinal data on work, nonwork and relationship issues. In addition, once-only data were collected to measure specific personality characteristics, and to collect other self-report data on self-characterisation, perception of work, nonwork and the transition to fatherhood. The questionnaires are contained in appendix VI.

### **Ethics**

The current research was conducted during a major transition in the lives of the participants. The transition affects almost all aspects of the life of a couple. It usually shifts the financial responsibility to the male partner at least initially. It has ramifications for women who usually withdraw from the workforce and are faced with a new, often isolating regime of activities. Social life is restricted and its character affected by the constancy of care which the baby requires. Relations with parents and in-laws assume a new complexion with the arrival of a baby. They can be strained. Sexual relations between the couple may be suspended for a considerable period due to the demands of parenthood. Sleep deprivation is common. If a child is premature, sick or is born with some disease or other ailment there is added strain.

As a social group the family is considered to be one of the most closed and private. Whilst all social groups have boundaries which demarcate insiders from outsiders the boundaries of the family group are probably the least permeable. There is a natural coalition in the family unit that acts to protect traditions, secrets and habits. Thus, when

a researcher has the opportunity to move into the realm of the family there is a better opportunity to access the private meanings of families (Daly 1992, p. 5). Whilst this may be advantageous in comparison to more remote methods of data collection it also heightens the ethical responsibilities of the researcher. Such was the case in connection with this research.

In any research the standard ethical issues which arise are those of informed consent and the risk-benefit equation. The topic of current research and the method of enquiry heightened the researcher's sensitivity to these. The pertinent aspects of informed consent and the risk-benefit equation are discussed below.

### **Informed Consent**

*Miscasting the Researcher.* The current research was contiguous with family life. There was a risk that a participant may cast the researcher in the role of a therapist and inadvertently reveal more intimate information than if such an attribution were not made.

*Research in the Home.* When family research is conducted in the home the participant may be 'lulled' into involuntary disclosures, due to 'the ambiance of the home and the serendipitous quality of the setting and the interaction' (LaRossa, Bennett & Gelles 1981, pp. 305-8). Unanticipated events such as the arrival of a visitor or a telephone call may produce insights of direct relevance to the study. Similarly exchanges may occur between partners which also yield valuable insights. However, if both parties are not participating in the research the privacy and the informed consent of the non-participating party is at issue.

## The Risk-Benefit Equation

Social scientific research does not generally involve overt threats to a person's health or well being. However, the risk of *public exposure* and the risk to the *self-esteem* of participants must be addressed particularly when qualitative methods are employed.

*Public Exposure.* In quantitative investigations it is easier to maintain distance from subjects. A battery of questionnaires can be administered either in person or by mail and little in-depth interaction need occur. Researchers typically inform subjects that confidentiality will be maintained by reporting only summaries of the data in research reports. Whilst quantitative methods have been used to describe and analyse much of the questionnaire data collected in this research, descriptive material and quotations from participants have also been reported. Thus, considerable attention has been given to altering personal details so as to protect the identity of participants whilst at the same time maintaining the integrity of each case study reported.

*Self Esteem.* Whilst participants may be quite open in an interview setting some may be disturbed by the way in which details of their experience are reported in a piece of research. There was a risk to the self-esteem of participants if they read and recognised what they might feel were rather clinical accounts of close personal experiences which they had recounted for a researcher. The private and sometimes secret character of family life and the importance of family life to self-esteem must not be underestimated (Larossa, Bennett & Gelles 1981, pp. 309–10).

The issues relating to informed consent and the risk versus the benefits of the research were addressed in the process of obtaining ethical approval for the conduct of the research. Because of the nature of the current research, the researcher embraced a high duty of care in informing the participants of the risk of public exposure and also the

self esteem risks which they may face were they to subsequently read the thesis or related documents. The measures, which were devised to address these issues, were ultimately incorporated in the Explanation and Consent Form devised for the research. This form is appended with the questionnaires in appendix VI. The process of obtaining ethical approval and the issues that were resolved are discussed below.

### **Obtaining Ethical Approval for the Study**

The intention was to recruit volunteer participants from parent education programs at a number of hospitals in metropolitan Melbourne. The process was initiated by telephoning five hospitals. Of the five, one is a private concern located in the northern suburbs of Melbourne, one is a public hospital catering for both public and private patients in the eastern suburbs, and three are city based public hospitals catering for both public and private patients. After identifying the relevant person at each of the hospitals a telephone contact was made. The researcher introduced himself, stated his affiliation and explained that the research was being undertaken for a doctorate. A description of the study was given. A request was made as to whether the hospital would allow participants to be recruited from their antenatal classes. The Chief Physiotherapist at one of the hospitals indicated an interest in the project. Thus, following the initial telephone contact, a letter was mailed to her detailing the nature of the study and the requirements in terms of the recruitment of participants. On the advice of that person, a copy of that letter was also mailed to the Parent Education Coordinator at the hospital, under the cover of another explaining the reason for the enclosure.



## Hospital Ethics Committee

The researcher was advised that any proposal would have to be reviewed and approved by the Research and Ethics Committee at the hospital. Thus, a formal process was initiated through the Secretary of that Committee. An application was prepared in accordance with the National Health and Medical Research Council (NH&MRC) guidelines for research involving human subjects. The application was considered at a meeting of the Research and Ethics Committee at the hospital. The researcher was required to attend this meeting to explain the project and to answer questions put by the members of the committee.

In a written communication the Chief Executive Officer indicated that the Research and Ethics Committee would approve the proposal subject to resolution of five issues. These issues concerned the nature of the study itself and the establishment of appropriate mechanisms for recruiting participants.

1. The Committee requested a letter from the research supervisor indicating that a suitably qualified collaborator with a background in psychology was available.
2. It was recommended that a collaborator from the hospital also be appointed to the study. The person identified was the psychiatrist in charge of the *Mother and Baby* unit at the hospital. The Committee indicated that this person would assist any couple who during the conduct of the study indicated a need for professional counseling.
3. The Committee also recommended that participants be advised at the first interview of the name and contact details of an appropriate person to contact in the

event that professional counseling was required. That person was the collaborator recommended by the hospital.

4. The Committee also requested that the Senior Medical Staff be appraised as to the nature of the project as they may have been aware of some of their patients who were suitable/unsuitable to participate in the study.

5. The researcher would be referred to the Director of Nursing who would act as the liaison between the researcher and the Parent Education Department at the hospital.

Each of these issues was addressed in a written communication that was forwarded to the Secretary of the Research and Ethics Committee at the hospital. Details were provided on how each of the issues raised by the Committee had been resolved. The researcher indicated that until the Committee had granted formal approval for the project, he would refrain from initiating any contact with the Director of Nursing.

### **The University Ethics Committee**

In tandem with this process an application for ethical approval was prepared and mailed to, the Secretary of the Standing Committee on Ethics in Research on Humans, at Monash University. After discussions with the Secretary the application was amended and resubmitted. The researcher was requested to attend the meeting of the Ethics Committee at which the application would be considered. Subsequently the Committee indicated its support for the project but with serious reservations about the involvement of the couple in the study and the intrusiveness of the study in respect of the couple relationship. The plan had been to involve both partners in the study but the committee

requested that the research design be revised to include only the male partner and that relationship issues were to be explored in a less intrusive fashion.

Following meetings with the supervisor and a member of the Ethics Committee a revised design and another application for ethical approval was submitted for consideration. The concerns of the university committee were also communicated to the hospital. The Research and Ethics Committee at the hospital indicated that the researcher had satisfied their requirements in respect of the study. However, formal approval would be delayed until the university ethics committee had granted approval. Subsequently the university ethics committee granted approval for the project. The hospital then released formal notification of its approval of the project.

### **Outcomes of the Ethics Process**

The process of securing ethical approval for the study was a lengthy one. However, it permitted an in-depth examination of issues of informed consent and the risk-benefit aspects of the research. As a result of this process the research design was altered to include only the male partner. From a methodological standpoint the researcher was reluctant to embrace this change. However, he respectfully acknowledged the judgment of the university committee which had deliberated for an extended period on the research proposal. Their judgment was that, given the topic of the research and the proposed approach, the participation of both partners might introduce tensions into a relationship at a time of significant change which of itself was likely to be stressful. Other alterations were made to the manner in which the couple relationship would be evaluated.

### **Recruitment of Participants**

Following official approval by both ethics committees the recruitment procedure began in earnest. The Parent Education Coordinator was contacted again and a preliminary meeting was arranged. At that meeting the coordinator was briefed on the nature of the study and its objectives. The coordinator indicated that the hospital conducted thirty-two antenatal classes per week. Whilst some classes were conducted during the day the majority were conducted in the evenings commencing at either 6.00 p.m. or 8.00 p.m. The duration of each class was two hours with a short interval after approximately one hour of instruction. In total couples attended eight classes commencing after twenty weeks of the term of the pregnancy had elapsed. A calendar detailing the commencement dates, times and venues for a series of classes to be conducted at the hospital was provided. At the conclusion of the meeting it was agreed that a protocol for recruiting participants would be devised and discussed at a subsequent meeting.

#### **The First Protocol**

The initial protocol was as follows:

Only evening classes would be attended as men did not generally attend day classes. The parent educator responsible for conducting a class would distribute an information sheet about the study at the commencement of the first class.

A short presentation would be made by the researcher during the tea break in the first class in a series. Interested men would be asked to record their first name, day and time of availability on a contact sheet for a follow up telephone call. Only first names

would be requested since participants in the study were to be anonymous. Days and times which were suitable for contact would be requested to minimise interruptions to the couple and to maximise the efficiency of the follow up process. The contact sheets would be collected by the parent educator and posted in a designated position on a noticeboard in the office of the Parent Education Coordinator. These sheets would be collected from the office at regular intervals.

Once the protocol was devised another meeting was held with the Parent Education Coordinator who agreed to advise her staff of their role in the process and implement the procedure. It was agreed that the procedure would be trialled in a number of classes commencing in the following week.

#### **Revision of the First Protocol**

After a two-week trial the recruitment protocol was reviewed since it was not yielding sufficient names for follow up contact. This was done in conjunction with the Parent Education Coordinator. A number of factors emerged which appeared to account for this. The most important was that couples were quite apprehensive at the first antenatal class. They appeared preoccupied with the ramifications of the pregnancy, which began to hit home during that class. On a few occasions the information sheet had not been distributed prior to the commencement of a class. This caused distraction and time pressure when the presentation was made since the researcher had to distribute them and canvas the content. Furthermore a review of the content, use of language and format of the information sheet indicated that it could be improved.

Consequently a number of refinements were made. The most important was to delay introducing the project until the fifth class in each series. By that time couples had

relaxed sufficiently to be comfortable about considering an involvement in the study. The Parent Education Coordinator spoke to each of the instructors advising them of the impending change in the procedure and emphasised the importance ensuring that the information sheet was distributed and read at the commencement of the fifth class. Each instructor was also asked to review the contact sheet to ensure that class participants had included a legible contact telephone number and that suitable contact times were clearly indicated.

The researcher took a more active role in communicating with each instructor. The information sheet was reworked so that it was shorter, had a more informal and inviting tone, and the font size was enlarged for easier reading. The researcher arrived at the classes at the commencement of the tea break and mingled with participants. The presentation was made following the tea break. When addressing the classes a lighter style of delivery was used whilst stressing the desire to recruit people for the study. Class participants were encouraged to ask questions during the presentation.

*Results.* A marked improvement was observed almost immediately after these changes were implemented. It became usual to secure from a class of ten couples three and often as many as five names for follow up contact. Recruitment continued until fifty-four names had been secured by which time the process of enlisting people for the study was almost complete.

#### **The Follow up Protocol**

A policy of following up contacts within several days of the relevant class was implemented. Since the researcher was generally at the hospital several times per week, it was easy to ensure that contact sheets were collected promptly. A protocol

was devised for establishing initial contact with potential participants. This protocol is described and explained below.

Those who had supplied their names and telephone contact numbers were contacted by phone. The following protocol was used:

1. Rapport was established by thanking the person for his expression of interest in the study, engaging in lighthearted conversation, and then moving gradually to the purpose of the call itself. Some time was spent speaking about the impending birth.
2. The reason for the study was explained. Potential participants were informed of the time commitment, and the nature and extent of the questions which would be asked of them. The ethical safeguards including the provisions for preserving anonymity were explained. It was stressed that if it was mutually agreed to arrange a first meeting potential participants could withdraw after the first face to face briefing or at anytime thereafter. Questions were encouraged about any aspect of the study.
3. The contact was advised that a series of screening questions would be asked to determine whether he was eligible for participation in the study. It was stressed that he could decline to answer any or all of the questions.
4. If it was mutually agreed to proceed, a date and time was arranged for the first meeting. It was explained that at least two hours would be required to complete each interview. People generally like to relax after the week's work and in Melbourne Friday night shopping is popular. Couples often combine this with taking

a meal or going for a social drink. Therefore, it was decided that if possible interviews should not be scheduled on Friday evenings. Thus, it was always suggested that the interviews be conducted on a weeknight and as close to 7.00 p.m. as practicable. Weekend interviews were not encouraged and it was also suggested that the interviews take place at the participants' home.

5. The conversation was closed by indicating that a telephone contact would be made twenty-four hours prior to the scheduled interview to confirm the date, time and place which had been agreed. In addition contact telephone numbers were supplied to facilitate the resolution of any further queries and for the notification of a change in schedule, which would or could affect the conduct of the first meeting.

As a result of the recruitment process twenty-nine men were enlisted for the study. Six of the ten men enlisted for the pilot study completed both interviews. Two withdrew for unknown reasons whilst, of the other two, one subsequently proved ineligible and another withdrew for health reasons. Of the nineteen men enlisted for the main study sixteen completed both interviews.

### **Conclusion**

In summary, the research design expressed the idiographic philosophy of Kelly (1955). Multiple case studies within which, both quantitative and qualitative data were collected by means of repertory grids and questionnaires formed the basis of the design.

In this chapter the eligibility criteria used to select participants for the study have been presented and justified. The ethical issues that required resolution have also been



discussed in depth. The details of the protocols devised to recruit participants and the subsequent revisions made to them have been presented.

The next chapter is the first of two consecutive chapters in which the results of the field research are presented.

## **CHAPTER 6**

### **THE PILOT STUDY**

#### **Introduction**

Three of the six cases studies completed in the pilot study are reported in this chapter. Two additional case studies are reported in appendix III.

The first two cases reported here comprise an introduction and four sections. They span work and nonwork, the transition to fatherhood, relationship issues and self-reported measures of stress during the transition to fatherhood. The second case also contains a section, which demonstrates how the ultimate configuration of the repertory grids was developed during the course of the pilot study.

The third case presented here shows how the output emanating from FUZZYGRID was amenable multidimensional scaling analysis. Issues pertaining to model selection when using MDS are discussed and also other technical matters relating to the analysis of grids. The chapter concludes by presenting an analysis of a grid, which shows how the FUZZYGRID results were melded with MDS. This is the precursor to the penultimate chapter in which a synthesised analysis of cases is presented by using repertory grids in concert with questionnaire data.

The detailed writing up of these cases was necessary for two reasons. Firstly, it provided an opportunity to practice the process of writing up case studies and to resolve a method for presenting them in a meaningful way. Thus the manner in which they are presented below represents a template that was configured some time after the cases were initially drafted.

Secondly, by writing up cases common themes and differences began to emerge so that the analysis of further cases became easier and the knowledge gained from them could be applied in the field.

The researcher had no other experience in applying the grid method except for the elicitation session conducted early in the research to gather data (the politicians' data) for testing purposes. At meetings and conferences with other PCP researchers it was emphasised that despite the apparent simplicity of the method actual administration was quite difficult. This sentiment was conveyed by Brown (1992) who wrote:

Training in non-directive interviewing techniques is essential if the technique is to work well and be minimally contaminated by experimenter effect ... Fast recognition of logical gaps is another essential investigator skill. Ability to recognize a suitable break point, ability to give "positive strokes", enabling a tired respondent to keep going until such a point is reached and many other interpersonal skills are needed (Brown 1992, p. 297).

Thus, to maximise the quality of the elicitation process the researcher needed to be proficient and confident using the grid method.

As indicated in chapter 5 the two studies overlapped such that participants in the pilot study were interviewed prior to the first round interviews for the main study and again prior to the second round interviews for the main study. The pilot study permitted the researcher to refine the instruments, develop interviewing skills and become proficient at eliciting grids. When the main study was commenced the elicitation of the grids was

routine, at least as far as the mechanics of the procedure were concerned. Some participants were less enthusiastic than others and two did not have the ability to complete the exercise. However, these were not negative experiences since they illuminated the issue of capacity in relation to the use of the grid method.

The first case study is presented below. Although the partners of participants were not interviewed both are referred to in each case. All names used are fictitious and other details have been altered to protect the anonymity of participants and their partners without affecting the integrity of the results reported.

### **Case 1: Stephen and Emma**

#### **Introduction**

Stephen and Emma lived in a renovated Victorian house in an inner suburb of Melbourne. Prior to this they had lived in London for twelve months whilst Stephen was on an assignment with his company. They had not planned to have a child but were not troubled in any way when they discovered that Emma was pregnant. The intention was that Emma would leave full-time work for a period of six to twelve months following the birth. Their daughter was born in March 1995.

Table 6.1 shows background information about Stephen and Emma.

**Table 6.1: Biographical Data for Stephen and Emma**

Variable/Attribute	Stephen	Emma
Age	31	29
Occupation	Engineer	Secondary teacher
Highest Educational Qualification	Undergraduate degree	Undergraduate degree
Job Status	Non-managerial	Non-managerial

## Descriptions of Self and Ideal Self

During the first interview Stephen was asked to provide five free response words or phrases to the question *Who am I?*

His responses were:

- Responsible;
- Caring;
- Conscientious;
- Hard worker;
- Good listener.

The descriptors *responsible*, *conscientious* and *hard worker*, reflected instrumental aspects of Stephen's perception of himself whilst *caring* and *good listener* reflected expressive aspects.

In the current research, scores on the masculinity and femininity sub-scales of the PAQ scale (Helmreich & Spence, 1978) were used to secure indications about orientations as masculine, feminine, androgynous or undifferentiated. These indications were based on the median split technique discussed in chapter 5. Stephen's scores on the masculinity and femininity sub-scales were 21 and 23 respectively. Since these scores were in the vicinity of the median benchmarks which were 20 for the masculinity sub-scale and 23 for the femininity sub-scale no clear classification was possible. However, during the course of the first interview an impression was formed that Stephen was a reflective people centered person whose nature was more expressive than instrumental.

During the second interview Stephen was asked to write down up to eight words or phrases, to describe his ideal self. In addition he was asked to rank them in order of importance and to score himself out of ten in respect of how close he felt he measured up to each of the nominated attributes. As a guide to scoring he was advised that where he felt he measured up to one or more of the attributes he should award a score of ten.

If he felt that one or more of the attributes were not descriptive of him he should award a score of zero. Intermediate scores could be used to reflect less definite perceptions.

The data emanating from this exercise shown in Table 6.2

Table 6.2: Stephen's Descriptions of his Ideal Self

Word/Phrase	Ranking	Rating
Caring person	1	9
Successful at life	1	5
Thoughtful and understanding	2	7
Conscientious	3	9
Logical thinker	4	8
Friend, time for everyone	5	7
Fun loving	6	6
Adventurous	6	6

Stephen ranked being a *caring person* and *successful at life* as the most salient attributes of his ideal self. Whilst the first attribute was expressive the second one appeared at first glance to be instrumental. However given that he chose to couch the term *successful* in the more inclusive context of his whole life; *success* was more than simply success in terms of his career. The second most salient attribute *thoughtful and understanding* reinforced the impression that Stephen was a people person who was very concerned about how he related to others. However he was also quite forthright about the need to be productive. This is reflected in the third ranked attribute *conscientious*. Stephen believed that these attributes found expression in his life, as indicated by the ratings that he awarded himself. He believed that he was *caring*, *thoughtful and understanding* of others, awarding scores of 9 and 7 respectively on these attributes. In terms of application, Stephen was happy about the level of effort he applied to all aspects of his life awarding himself a score of 9 on the *conscientious* attribute.

In terms of his cognitive abilities Stephen perceived himself as a *logical thinker*. His background and the type of job he had were evidence of this.

Moreover when Stephen was completing the questionnaires he did on a number of occasions seek clarification or elaboration on issues. His method of questioning indicated that his thinking was ordered. Expressiveness was again indicated by the sixth ranked item *friend, time for everyone* whilst the last two were indicative of Stephen's zest for life.

On balance Stephen presented as a person who although aware of the need to be *responsible, conscientious* and *hard working* was also strongly oriented towards the expressive aspects of life. In relation to his work he indicated that his needs were that his work be 'enjoyable and challenging' but that the primary rewards were 'people contact'. He indicated that he had no specific career goals and was not 'obsessed by the idea of promotion'.

### Work and Nonwork

Work and nonwork data for Stephen is shown below.

**Table 6.3: Work Related Data for Stephen**

Variable	First Interview	Second Interview
Years of work experience	10	
Time with current employer	10	
Time with previous employer <sup>(a)</sup>	None	
Hours of work per week	51-60	51-60
<i>Work at home</i>		
Evenings	Yes	Yes (occasionally)
Weekends	No	No
Work at the office on weekends	4	4
Job satisfaction	4	4
Occupational satisfaction	4	4
Organisational satisfaction	4	4
Job commitment	4	4
Occupational commitment	4	4
Organisational commitment	4	4

(a) Data reported in the first three rows were collected only at the first interview.

At the time of the first interview Stephen occupied a non-managerial position in the organisation for which he worked. He had worked for that organisation since completing

his university degree. He had not changed jobs nor been promoted by the time the second interview was conducted.

In the first questionnaire Stephen reported that he typically worked over 50 hours per week. It was quite common for him to work at home in the evenings. He had a computer link to his place of work and was often required to respond to technical enquiries from overseas affiliates. This tended to occur in the evenings due to time differences. Whilst Stephen did not work at home on the weekends he did visit his office. However he indicated that this occurred irregularly. The pattern of work reported at the first interview was also indicated at the second with the exception that evening work at home had been significantly reduced.

#### **Distinguishing Between Work and Nonwork**

When asked to differentiate between work and nonwork life Stephen responded that the similarities were that he performed in both domains 'to the best of my abilities', a response indicative of the salience of *conscientiousness* mentioned in his self and ideal self descriptions. Stephen also said that 'enjoyment and satisfaction' were integral to work and nonwork. The differences mentioned were that nonwork activities were 'not as intense and can be carried out at my own pace'. When asked to define leisure Stephen responded that leisure is 'time and activities outside work'.

At the first and second interview Stephen was asked to record his level of satisfaction with the time he had to pursue nonwork activities alone and with Emma. These are shown in Table 6.4 below.



**Table 6.4: Stephen's Satisfaction with Time Available for Nonwork Activities**

Activities by occasion	First Interview	Second Interview
Activities with partner <sup>(a)</sup>	2	4
Activities without partner	3	4

(a) Responses were rated on five point Likert Scale 1 = Completely dissatisfied, 5 = Completely satisfied.

It may be seen that Stephen's reported levels of satisfaction about opportunities to engage in nonwork activities were higher on the second occasion. This may have reflected altered expectations since as was shown in Table 6.3 Stephen's pattern of working hours was essentially unchanged after the birth of the baby.

### Household Work

On both occasions Stephen scored low in terms of the frequency with which he engaged in household work classified as *traditional-feminine*. For tasks classified as *traditional-masculine* he scored very high on both occasions. On the *androgynous* tasks he also scored very high on both occasions. His reported contributions are presented in Table 6. 5.

**Table 6.5: Stephen's Contributions to Household Work**

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	1.50	1.50
Grocery shopping	2.50	2.50
Cleaning	1.50	0.00
Ironing	0.00	1.25
Cooking the evening meal	4.00	6.00
Subscore <sup>(a)</sup>	9.50	11.25
<i>Traditional Masculine</i>		
Gardening	2.00	2.00
House maintenance	2.50	2.50
Subscore	4.50	4.50
<i>Androgynous</i>		
Budgeting	4.00	4.00
Paying bills	7.50	7.50
Negotiations with external agencies	2.50	2.50
Subscore	14.00	14.00
Total Score	28.00	28.50
Satisfaction with the division of household work	4.00	5.00

(a) The maximum achievable total score was 57.5 made up of the sub-score maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.00 for androgynous tasks.

The division of labour in the household appeared to have been along traditional lines prior to and after the birth of the baby. On both occasions Stephen's contribution to household work classified as traditional feminine was low. Only a small increase in his contribution in this area was reported at the second interview. This was in relation to cooking the evening meal. At the second interview Stephen reported that he had cooked the evening meal twice in each of the preceding two weeks. On both occasions Emma was not participating in paid work. This and the long hours of work which were reported by Stephen on both occasions to be between 51 and 60 hours per week may explain his low contribution in this area. Stephen assumed almost total responsibility for the less regular tasks such as gardening and house maintenance. He also assumed almost sole responsibility for paying bills, budgeting and negotiations with external agencies. On both occasions he expressed high levels of satisfaction with the household division of labour.

### **The Transition to Fatherhood**

#### **Prospective View**

When asked about becoming a father Stephen said that he was 'scared and excited'. He was aware that he and his wife would be totally responsible for the life and development of the child. He indicated that his relationship with Emma had altered even though she had not yet given birth to the baby. The pregnancy had already affected the exclusivity of their relationship. Emma's physical condition had imposed restrictions on them.

Stephen had not given much thought to his needs as a father. He viewed himself as a support person. However he was quite clear that the father was also the breadwinner

and that he would be responsible for the financial security of the family. He indicated that the financial demands consequent upon having children might motivate him to seek promotion, requiring more time at work. However Stephen's belief was that he would need to establish a boundary between work and nonwork once the baby was born and communicate to his colleagues his need to have help in managing his workload. He also said that he was going to try to regulate the time he spent working at home once the baby arrived. As is shown in Table 6.3, at the second interview Stephen reported that he only worked at home occasionally. This contrasts with his response at the first interview where he reported working at home in the evenings but did not qualify his response.

Stephen was clear that becoming a father would affect his discretion and that he would need to be 'flexible' not 'rigid' in his approach to things. He felt that his nonwork time would be absorbed much more with activities centered on the baby.

### **Retrospective View**

At the second interview Stephen was asked to describe the changes which had occurred in his life since the birth of the baby. His response is shown below.

I have realised how impatient I can be yet this has meant that I have thought more about how my partner is feeling and coping with being at home with the baby. I am more conscious of my partner's mood and am able to identify more readily when she wants help. Sleep has become a priority at times. In hindsight our social life has disappeared yet it is not noticeable at the time in that the baby has filled any time we had for socialising or going out to dinner etc. This has at times generated a feeling of being locked in but this feeling soon disappears.

There is an affective quality in this extract that is somewhat subdued. This accords with the impression of the researcher when he visited the couple on the second occasion. There is in the extract an internal rather than an external orientation due to the demands that the baby had placed on the couple. As is quite common sleep deprivation is

indicated. Earlier it was argued that Stephen might have altered his expectations about time to pursue nonwork and social activities. This was proposed since although his hours of work remained unchanged after the birth his reported level of satisfaction with time to pursue nonwork activities increased. Altered expectations and an acceptance of restrictions because of the baby are mooted in the last sentence of the interview extract.

### Descriptions of Self as a Father

At the second interview, Stephen was asked to write down descriptions of how he perceived himself as a father. He was also asked to rank them in order of importance and to score them in terms of how much he perceived that he manifested those descriptions. The range of scores was [0,10] where zero was indicative of a perception that the descriptor was not manifested in behaviour the opposite being the case in respect of the maximum score. His responses are shown in Table 6.6

Table 6.6: Stephen's Descriptions of Self as a Father

Word/Phrase	Ranking	Rating
Providing comfort	1	10
Protector	2	10
Teacher	3	8
Entertainer friend	4	9
Financial provider	5	10
Disciplinarian	6	4
Bath playmate	7	6
Night watch person	8	7

The content of these descriptions was consistent with Stephen's earlier descriptions of self and ideal self. The expressive dimension of his personality is at the forefront as evidenced by the description of himself as 'providing comfort'. He ranked this first and awarded himself a rating of 10 in terms of the expression, which he gave to this attribute. The second highest ranked attribute, which was also scored at 10, was that of 'protector'.

Thus there was a traditional element in Stephen's perception of the role of father, which aligned with the notion of the male as the warrior who protects his family against incursions. Stephen awarded himself a rating of 10 on this attribute. The role of breadwinner appeared fairly low in the hierarchy: it ranked fifth. However Stephen rated himself at 10 in terms of the expression which he gave to this role. Thus whilst it did not dominate his view of himself as a father Stephen knew that he must be the 'financial provider' at least in the short term.

In relation to the interactions with his child Stephen saw himself as a *teacher* ranked third and rated at 8, 'entertainer and friend' ranked fourth and rated at 9, and 'bath playmate' ranked seventh and rated at 6. There is a mix here in that the role of teacher has an instrumental quality whilst the other attributes are expressive. Stephen did not see himself as a 'disciplinarian'. He ranked this sixth and rated himself as 4 out of ten in terms of the expression which he gave to this aspect of his role as a father. Based on the interviews conducted with Stephen the researcher would have described him as gentle and reflective. It was not surprising in the descriptions the role of disciplinarian appeared lower down in the hierarchy.

In summary, Stephen was consistent in that the expressive aspects of his personality surfaced when he was asked to describe himself from a number of standpoints. The attributions that he made to work as being important because of the people contact, and the salience of marriage and family life, pointed to a person who on balance was more *expressive* than *instrumental* in his orientation.

## Babycare

Stephen's reported contribution to babycare is shown in Table 6.7.

**Table 6.7: Stephen's Contributions to Babycare**

Task	Score
Changing nappies	7.50
Bathing	7.50
Night tending	15.00
Play	5.00
Taking the baby for a stroll	1.00
Giving partner time alone	6.00
Total Score <sup>(a)</sup>	42.00

(a) Maximum achievable score = 50

From this data it may be seen that Stephen made a substantial contribution towards the care of the baby.

## Relationship Issues

At the time of the first interview Stephen and Emma had been married for three years. They had not lived together before they were married.

### Relationship Characterisation and Salience

During both interviews Stephen was asked to provide a characterisation of his relationship using the exercise devised by Belsky (1985, p. 858) where notional tokens are allocated across the three attributes of romance, friendship and partnership. He was also asked to rank his various roles. At the second interview he was also asked to complete the *Life Role Salience Scales* (LRSS) (Amatea, Cross, Clark & Bobby 1986). The data emanating from those responses are shown in Table 6.8.

**Table 6.8: Relationship and Role Sallence Data for Stephen**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	4	3
Friendship	6	6
Partnership	5	6
<i>Ranking of Roles</i>		
Career	2	2
Marriage	1	1
Family life	3	1
Leisure	4	3
<i>Role Saliene Subscales<sup>(a)</sup></i>		
Career		34
Marriage		43
Parenting		45
Home		40

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

On each occasion Stephen characterised his relationship as one where of the three dimensions friendship and partnership were predominant elements. It is clear from these data that marriage and family life appeared to be the most salient aspects of Stephen's life. On both occasions Stephen ranked his marriage ahead of work in terms of importance to him. At the second interview family life emerged equally salient to marriage. The centrality of marriage and family is also evident from the role salience data. The marriage and parenting roles scored significantly higher on the role salience subscales than career.

### **Marital Satisfaction**

Marital satisfaction data reported by Stephen at each interview using the Marital Relations Scale (Huston 1983) are shown in Table 6.9 below. Also shown is his score on the relationship with spouse subscale embedded in the Parenting Stress Index (Abidin 1983) which was administered at the second interview.

**Table 6.9: Stephen's Marital Satisfaction Levels and Spouse Relations**

Item	First	Second
<i>Marital Satisfaction Scale</i>		
Miserable/Enjoyable <sup>(a)</sup>	6	6
Hopeful/Discouraging	7	7
Free/Tied Down	6	5
Empty/Full	6	6
Interesting/Boring	7	6
Rewarding/Disappointing	7	6
Doesn't Give Me Much Chance/Brings out the Best in Me*	6	5
Lonely/Friendly	7	6
Hard/Easy	5	5
Worthwhile/Useless	6	6
Overall Satisfaction	7	6
Relationship with Spouse <sup>(b)</sup>		18

(a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.

(b) The maximum achievable individual score on this subscale was 35.

Stephen's ratings on each of the items in the marital satisfaction scale were high on both occasions. The median rating was 6 on both occasions. Similarly he reported high levels of overall marital satisfaction on both occasions. Thus the birth of the baby appeared to have no effect on the reported level of marital satisfaction from Stephen's point of view. Stephen's self-report score on the spouse relation's subscale was 18. Abidin (1983, p. 34) suggested that individuals 'who earn high scores on this subscale are those who are lacking emotional and active support of the other parent in the area of child management'. Stephen did not indicate any difficulties in this regard. In summary, Stephen reported very high levels of satisfaction with his relationship and strong support from his partner.

### **Parenting Stress and Related Measures**

Stephen's scores on the subscales of the Parenting Stress Index (PSI) (Abidin 1983) are shown in Table 6.10 below.



**Table 6.10: Parenting Stress Measures for Stephen**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	10
Child mood	17
Child adaptability	36
<i>Domain Score</i>	63
<i>Parent Characteristics Domain</i>	
Competence	26
Attachment	15
Restrictions	21
Isolation	13
Relationship with spouse	18
Parental health	13
<i>Domain Score</i>	106
Parenting stress index score	169

Stephen's overall score on the PSI was well below the benchmark of 182. However, when the second interview was conducted there were indications that the baby was difficult to settle at night. Stephen reported that in the two weeks prior to the second interview he had woken to tend to the baby every night. Similarly the child mood and adaptability subscale scores shown in Table 6.10 exceeded the benchmarks of 13 and 31 respectively. Thus, there appeared to be some stress caused the behaviour of the baby.

At the second interview Stephen was asked to rate the level of difficulty which he encountered during the transition to fatherhood and the perceived levels of stress related to the role of father, his work and his relationship. The ratings are shown in Table 6.11.

**Table 6.11: Stress Ratings Reported by Stephen**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	2
Stress as a result of becoming a father	5
Stress from work pressures	3
Relationship stress	3
Overall stress since the birth of the baby	3

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

As indicated by this data the transition to fatherhood was easy for Stephen. It was apparent at the first interview that he was prepared for the change to his regime which parenthood would necessitate. Similarly he reported low levels of overall stress since the birth of the baby. However in absolute terms and relative to the level of stress reported in connection with his work and his relationship, the level of stress reported by Stephen as a result of becoming a father was high. At the first interview he had vocalised some apprehension about the practicalities of fatherhood. This and the fact that the baby was unsettled and difficult to calm are factors that may account for this high rating.

### **Summary of Stephen and Emma's Case**

The overall impression following two meetings with Stephen and an analysis of the questionnaire, and interview data supplied by him was one of stability and routine. The only difficulties that appeared to have emerged following the birth of the baby were connected with the baby's temperament and adaptability. In all other respects the transition appeared to have been relatively easy. Stephen displayed flexibility in that he was prepared to forego his own free time in order to help his wife with the baby and join in family focused activities.

Stephen appeared to have easily managed to balance his needs and responsibilities across the domains of work and family. He was able to moderate the amount of work that he did at home following the birth of the baby.

Despite working 50 hours a week or more Stephen did not appear to be driven by an ambition to get to the top. His job required long hours but he did not have a clear career

path mapped out. Marriage and family life appeared to be superordinate to Stephen's sense of self.

## **Case 2: William and Anna**

### **Introduction**

William was a teacher who at the age of 33 had opted for a career change. He elected to establish a furniture manufacturing business with two partners. At the time of the first interview William was heavily involved with the venture and at the same time renovating a Victorian house in inner Melbourne. Whilst he had a background in the hard sciences he was also a very creative person with a strong sense of the aesthetic. He was well read and displayed a critical disposition. William's partner Anna was a computing professional. At the time of the first interview she was working as a manager with a service organisation. Anna and William were very friendly and outgoing people. At the first and second interview they were open about their lives and their experience of the transition to parenthood.

Background information about William and Anna is shown in table 6.12.

**Table 6.12: Biographical Data for William and Anna**

Variable/Attribute	William	Anna
Age	35	29
Occupation	Furniture manufacturer	Computing professional
Highest Educational Qualification	Undergraduate degree	Undergraduate degree
Job Status	Self employed	Middle management

## Descriptions of Self and Ideal Self

In response to *Who am I?* William responded as follows:

- Hard working;
- A loving partner;
- Extroverted;
- Interesting and interested.

These descriptions said much about William. There was ample evidence of his hard working nature at his home, by his descriptions of his renovation plans, and by the impression conveyed about the input required by him in his business. The overall impression was one of busyness. However, whilst hard work was necessary and important to him he was also very strong on the expressive dimension.

William descriptions of his ideal self are shown in Table 6.13.

**Table 6.13: William's Descriptions of his Ideal Self**

Word/Phrase	Ranking	Rating
Honest	1	8
Loving	2	8
Healthy	2	5
Happy	2	9
Caring	2	9
Intelligent	3	8
Hard working	3	8
Responsible	4	5

These descriptors may be interpreted as explicit poles of personal constructs that describe William's ideal self. In terms of the rankings *honest* is superordinate. The second most salient group of constructs refers to personal attributes valued by William. To be *loving* and *caring*, *happy* and *healthy* was important to him. The instrumental dimensions to William's ideal self are represented by the constructs *hard working* and *intelligent* each of which was ranked third in the hierarchy. A separate construct *responsibility* was ranked fourth. William awarded himself very high scores on each of the expressive and instrumental constructs but was reserved about his health and his perception of how responsible he was. His health may have been compromised by his

heavy work commitments. Details of William's working hours are shown in the next section.

### Work and Nonwork

Work related data reported by William is shown in Table 6.14.

**Table 6.14: Work Related Data for William**

Variable	First Interview	Second Interview
Years of work experience	More than 10	
Years with current employer	3	
Years with previous employer <sup>(a)</sup>	3	
Hours of work per week	61-70	51-60
Work at home		
Evenings	No	No
Weekends	No	No
Work at the office on weekends	Yes	Yes
Job satisfaction	4	4
Occupational satisfaction	4	4
Organisational satisfaction	3	4
Job commitment	5	4
Occupational commitment	5	4
Organisational commitment	5	4

(a) Data reported in the first three rows were collected only at the first interview.

Prior to the birth of the baby William was working such long hours that the time available for renovating the house and recreation was at a premium. Whilst he had reduced his working hours after the birth he was still working long hours. He had worked at the factory every weekend before the birth and reported at the second interview that he was working three weekends per month. At the time the second interview was conducted Anna had returned to full-time paid work and was working 30 to 40 hours per week. Thus, both partners were working full-time with a young baby aged nine and a half months. The ratings in Table 6.14 suggested that William's level of commitment to the work domain fell following the birth of the baby. This was supported by the reduction in his working hours. His satisfaction with the business increased. At the first interview he was reserved about the business and its prospects. However, at the second interview he was more optimistic since the marketing of their product range had resulted in increased sales.

## Distinguishing Between Work and Nonwork

That William experienced time pressure was evidenced by his response to an enquiry about his work and nonwork life. He responded to a question about the similarities and differences between work and nonwork as follows:

Both require commitment to achieve satisfaction.  
Both compete for my time.

Thus, the commitment necessary to achieve satisfaction in the work and nonwork domains, required time that was short due to William's long hours of work. There were indications from William that he experienced time pressure and constraints on his capacity to pursue nonwork activities with and without Anna. The satisfaction ratings reported by him in relation to this are shown in Table 6.15.

**Table 6.15: William's Satisfaction with Time Available for Nonwork Activities**

Activities by occasion	First Interview	Second Interview
Activities with partner <sup>(a)</sup>	2	2
Activities without partner	2	3

(a) Responses were rated on five point Likert Scale 1 = Completely dissatisfied, 5 = Completely satisfied.

These ratings were indicative of the time pressure experienced by William. The time commitment required to develop the business appeared to have eroded opportunities for recreation and other nonwork activities such as renovating the house.

In describing leisure William said that it was 'activity which one engages in solely by choice, for enjoyment'. Thus the theme of discretion, which had been mooted by Stephen, began to emerge as a conception of leisure.

## Household Work

William's reported contributions to household work are shown in Table 6.16.

**Table 6.16: William's Contributions to Household Work**

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	1.5	1.5
Grocery shopping	1.3	0.0
Cleaning	4.5	6.0
Ironing	2.5	0.0
Cooking the evening meal	6.0	2.0
Subscore <sup>(a)</sup>	15.8	9.5
<i>Traditional Masculine</i>		
Gardening	2.5	2.5
House maintenance	2.5	2.5
Subscore	5.0	5.0
<i>Androgynous</i>		
Budgeting	4.0	4.0
Paying bills	4.5	4.5
Negotiations with external agencies	1.5	1.5
Subscore	10.0	10.0
Total Score	30.8	24.5
Satisfaction with division of household work	3.0	3.0

(a) The maximum achievable total score was 57.5 made up of the sub-score maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.00 for androgynous tasks.

On the first occasion William's reported contribution to feminine tasks was low. Whilst he maintained a significant contribution to the traditional masculine and androgynous tasks his reported contribution on the second occasion to the traditional feminine tasks was down in all areas except for cleaning. He reported only moderate satisfaction on each occasion with the division of household labour.

## The Transition to Fatherhood

William elaborated his perception of the changes, which had occurred in his life after his daughter was born as follows:

- More baby caring activities (of course);
- Decreased social outings (but not as much as I expected);
- More family contact;
- More sharing of home duties;
- A new "sun" has risen in my life to match and complement and augment the love I share with my partner.

William was cognisant and accepting of the changes which had occurred since the birth of the baby. His perception was that there was more 'sharing of home duties'. However, as shown in Table 6.16, his overall contribution to household work was down on the

second occasion and the reductions were recorded in the areas of grocery shopping, ironing and cooking the evening meal. It may have been that in the two weeks prior to the second interview circumstances had prevented William from making his normal contribution to household duties but he did not indicate this during the interview. The last response by William indicated that he was enamoured by the birth of his daughter. Evidence of this was provided by his descriptions of himself as a father and by his reported contribution to baby care.

### Descriptions of Self as a Father

William's descriptions of himself as a father are shown below.

**Table 6.17: William's Descriptions of Self as a Father**

Word/Phrase	Ranking	Rating
Teacher	1	9
Protector	1	8
Comforter	1	8
Companion	2	8
Role model	2	5
Provider	3	8
Nursemaid	3	6
Discipline	4	5

This was a comprehensive set of descriptors. The first 'teacher' reflected the salience of learning and William's very strong perception of himself as a teacher. The second was indicative of a traditional perception of the father as a 'protector'. Expressive qualities were indicated by the descriptors of 'comforter' and 'companion' whilst the notion of the father as a positive example was bound up in the 'role model' descriptor.

Although the traditional role of provider appeared quite low in the hierarchy, William saw himself very much as a provider scoring himself 8 out of 10. Thus whilst it was not the most salient attribute of his role as a father, it was important to him that he acquitted himself well in this regard. The fact that Anna had already returned to work by the time



the second interview was conducted may also explain the relatively low salience of the provider role; Anna and William shared the role.

William's score on the AWS scale, which was 43 from a maximum of 45, indicated a modern attitude to women and their roles. Similarly his scores on the masculinity and femininity subscales of the PAQ were 20 and 27 resulting in a classification of him as androgynous. However, Williams's contributions to feminine tasks did not reflect a modern attitude. Spence and Helmreich (1978, p. 28) reported that studies had indicated the utility of the using classification scheme devised by them in predicting behaviour consistent with specific classifications. However they also noted that 'the degree to which individuals exhibit agentic or communal behaviors, we again emphasise is determined by a multiplicity of self and situational variables'. Thus, a judgement had to be made about whether or not the impression of William as a modern male was reasonable. The judgement was that his extensive commitments at work reduced his capacity to make greater contributions at home.

### Babycare

William's reported contributions to babycare are shown below.

**Table 6.18: William's Contributions to Babycare**

Task	Score <sup>(a)</sup>
Changing nappies	7.5
Bath	1.5
Washing	15.0
Play	5.0
Taking the baby for a stroll	1.0
Giving partner time alone	6.0
<b>Total Score</b>	<b>36.0</b>

(a) Maximum achievable score = 50.

In relation to the participant group these contributions were above average.

## Relationship Issues

### Relationship Characterisation and Saliency

William and Anna were not married but had lived together for three years prior to the birth of the baby. They had known each other for a significantly longer period. William made the point that he did not differentiate between his relationship with Anna and other couples who were married. Indeed at several points he referred to Anna as his wife. He and Anna were cerebral and shared a dry sense of humor. Their interactions were suggestive of a strong, understanding relationship and a significant degree of mutual commitment.

The table below shows the relationship characterisation reported by William as well as role saliency data.

**Table 6.19: Relationship and Role Saliency Data for William**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	4.0	4.5
Friendship	6.0	6.0
Partnership	5.0	4.5
<i>Ranking of Roles</i>		
Career	2.0	2.0
Marriage	1.0	1.0
Family life	1.0	1.0
Leisure	2.0	2.0
<i>Role Saliency Subscales<sup>(a)</sup></i>		
Career		32
Marriage		46
Parenting		41
Home		34

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

The relationship characterisation reported by William was similar on the first and the second occasion. An expectation was that the partnership element may have become more salient after the baby was born but this was not the case. The longevity and

maturity of their relationship may explain why the relationship characterisation remained virtually unchanged between the first and the second interview.

The role salience data indicate how important William's relationship and family life were to him. His scores on the role salience measures clearly show that these were perceived by him to be more important than career or having a nice home. On the face of it these scores appear to contradict other information supplied by him. If his relationship and family life were the most salient, then why did he spend what appeared to be an inordinate amount of time at work? The answer would appear to be that long hours were almost mandatory in order to secure the future of the business. Whilst William had reduced his working hours after the birth of the baby, they were still in excess of 40 hours per week. Prior to the birth Anna had indicated that she was eager to progress her career. As mentioned she had returned to full-time work within nine months of the birth. An important factor in enabling Anna and William to manage their working lives was the strong support provided by Anna's mother who provided considerable assistance with childcare. At the first interview William made a point of praising Anna's mother and was very positive about the quality of his relationship with her. Thus, whilst William and Anna had very busy work lives the extended family assisted with the management of the transition to parenthood.

## Marital Satisfaction

Marital satisfaction data reported by William are shown in Table 6.20 below.

**Table 6.20: William's Marital Satisfaction Levels and Spouse Relations**

Item	First	Second
<i>Marital Satisfaction Scale</i>		
Miserable/Enjoyable <sup>(a)</sup>	7	6
Hopeful/Discouraging	7	6
Free/Tied Down	5	4
Empty/Full	7	7
Interesting/Boring	6	7
Rewarding/Disappointing	6	7
Doesn't Give Me Much Chance/Brings out the Best in Me*	6	6
Lonely/Friendly	7	6
Hard/Easy	4	4
Worthwhile/Useless	7	6
Overall Satisfaction	6	6
Relationship with Spouse <sup>(b)</sup>		16

- (a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.  
 (b) The maximum achievable individual score on this subscale was 35.

On the whole these ratings were high and consistent over the period between the first and the second interview.

## Parenting Stress and Related Measures

Parenting stress and other reports of stress during the transition to parenthood are shown in Tables 6.21 and 6.22.

**Table 6.21: Parenting Stress Measures for William**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	7
Child mood	7
Child adaptability	24
<i>Domain Score</i>	38
<i>Parent Characteristics Domain</i>	
Competence	22
Attachment	10
Restrictions	16
Isolation	12
Relationship with spouse	16
Parental health	12
<i>Domain Score</i>	88
Parenting stress index score	126

William's score on the parenting stress index was low. His case was reviewed to see whether this may have been a false positive. William reported the following stress scores in relation to the transition experience.

**Table 6.22: Stress Ratings Reported by William**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	2
Stress as a result of becoming a father	2
Stress from work pressures	6
Relationship stress	4
Overall stress since the birth of the baby	5

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

This table indicates that William had little difficulty with the transition to fatherhood but that work stress had been an issue for him. This was not surprising given the long hours he worked and the pressure associated with maintaining the viability of a small business. He indicated that competitive pressures were strong in relation to the products manufactured by his company. He also said that he could not afford to employ functional specialists employed in the business. Thus he and his partners were required to fill multiple roles in order to minimise costs.

### **Summary of William and Anna's Case**

At both interviews William presented as a hard working man whose time was at a premium. He was an intellectual person who took pleasure in activities like reading and conversing with his wife and friends in his spare time.

William and Anna may be described as a 'dual career' (Rappaport & Rappaport, 1969) couple in that both invested heavily in their work roles. Whilst William reported that the transition to fatherhood had been easy for him significant stress was associated with his long hours of work and the risks in running a fledgling small business.

## **Developing the Repertory Grids**

The second interview with William was used to trial a method of construct elicitation. The outcome of this was a substantial revision of the grid design and the protocols used to elicit constructs. This is discussed below.

### **The Initial Design**

Initially it was envisaged that one repertory grid would be elicited from participants. In the style of Kelly (1955) the elements would be role titles representative of significant others such as mother, father, boss, disliked person and most successful person. Following Kelly (1955) 19 role titles were written on index cards that were numbered from one to 19. The role titles were also written on a form that was ruled as a grid with provision for rating the elements against the constructs.

This set of elements was used in an elicitation conducted with William. A triad of index cards each with a role title written on them was placed in front of him. The numbers, which identified each of the role titles on the index cards, were recorded in the leftmost column of the first row on the grid form. William was asked to look at the cards and group together the two that were similar in some way and different from the third. Then, the numbers in the left-most column of the first row on the grid form, corresponding to the role titles construed as similar, were circled. William was asked to verbalise his responses in terms of the similarity between the two nominated elements and the manner in which the third was different. These responses were recorded as constructs on the form in the usual way. The response, which described the similar elements, was recorded as the left-hand explicit pole and the response describing the element that was construed as different was recorded as the right hand implicit pole.

During the procedure it became evident that William was having difficulty articulating the constructs and was uncomfortable with those which he had verbalised. This was not due to any incapacity on his part since he was a logical person with a background in mathematics, had grasped well the mechanics of the process, and had a good facility with language.

Stringer (1979) argued that there was an incongruity between Kelly's (1955) theory and the design of the Repertory Grid. The theory was focused on the individual whilst the test used role titles as elements for the elicitation of constructs. He hypothesised that:

The construing of roles would be less complex, less differentiated, on the grounds that constructs regarding roles are more consistently validated than constructs about particular individuals. Such a prediction can be derived from personal construct theory; and Bannister (1963, 1965) has shown that successive validation leads to a less elaborated and differentiated construct system, or tightening of construct relationships (Stringer 1979, p. 94).

Stringer (1979) conducted an experiment to test the hypothesis and found that

The construing of individuals will be different from, and more differentiated than, role construing (Stringer 1979, p.99).

Moreover, the construct categories used to classify the elicited constructs indicated that there was a qualitative difference between constructs that were used to construe roles and those which were used to construe individuals. Constructs, which dealt with *extraversion – introversion, sense of humour, maturity and aggression* were more likely to be applied to individuals. Those used to describe roles such as *socially powerful* and *commanding respect* were generally less relevant to individuals (Stringer 1979, p. 98). The constructs relating to roles had a strong 'positional' component (Stringer 1979, p. 109).

Reiterating the philosophy of PCP, Stringer (1979, p. 111) maintained:

That the experimenter's and the subject's understanding of one another and of the investigation must all be part of what is under investigation. These factors are contextual foreground not background. The relationship, which is constructed between the two parties involved, is not simply a method or procedure, it is an event like the events, which are being investigated.

Also reflecting the mutuality underlying the philosophy of PCP, Fransella and Bannister (1977, pp. 19–21) suggested that researchers canvass difficulties with participants in order that some resolution occurs. Thus, following Fransella and Bannister (1977) and Stringer (1979), William was asked to verbalise the difficulties he was having with the elicitation process. The essence of the problem appeared to be that he found it difficult to relate to the role titles. Consequently, a decision was made to review the design of the grid and the elicitation process. The issues that emerged are discussed below.

### **The Size and Scope of the Grid**

Firstly, the grid was too large and broad in scope. A decision was made to design three smaller repertory grids to span the work and nonwork domains. Whilst adhering to Kelly's notion that the way in which a person construes other people and the self may illuminate their personality, it was felt that how people construe activities may also offer insights into the individual personality. Therefore, it was decided that two grids would be used to elicit constructs about people in the work and nonwork domains, and another to elicit constructs about activities in the work and nonwork domain. This orientation towards activities followed similar work reported by Brook (1989), Knowles and Taylor (1990) and Brook and Brook (1993). It would have been preferable to have two grids for activities, one for each domain. However, it was decided that it would be too time consuming and taxing on participants to try and elicit four grids.



### **The Type and Configuration of the Elements**

The second issue concerned the type of elements to use. For the people grids it was decided to use named individuals not roles as elements, with two exceptions. For the nonwork people grid, two supplied elements would be *myself as a father* and *my ideal self*. Kelly (1955, pp. 297-8) discussed the possibility that in respect of certain roles such as mother or father people develop two levels of meaning. At one level they understand the role of mother or father but at another they have an experience of the person who is their mother or father. This potential for a *duality of meaning* was recognised in respect of two role titles named above. Firstly the elements were personalised to focus the participants attention on how they construed themselves in the roles. Secondly the father role and the ideal self will naturally accrue a character representative of the wider social conception of them. People may be expected to express at least some of these.

In researching constructs about leisure, Knowles and Taylor (1990, p. 738) asked participants to nominate specific work and family activities in three categories. The categories were frequency, affect and salience. These categories were used in configuring the remaining elements for the nonwork people grid and the other two grids.

### **The Number of Elements**

In the current research it was decided to use eight elements for each grid and to elicit eight constructs by asking participants to construe triads of elements. Although it would have been preferable to use slightly larger grids, the time allowed for the completion of each interview was a constraining factor. Times recorded during the pilot study indicated that on average the time taken to complete the questionnaire was 50 minutes. Whilst it eventuated that in almost all cases the first grid was time consuming to elicit

and the others were less so, the total time to complete one interview was approaching three hours when the time taken to complete the questionnaires was factored in. Given that some additional items were to be added to the questionnaire for the second round interviews there was little scope for larger grids. Furthermore, since most of the interviews were conducted after working hours, three hours was judged to be the maximum one could expect from a participant and maintain the quality of the process.

The elements used for each grid are shown below.

**Table 6.23: Element Types and Configuration for Work-Nonwork Activities**

Element Types	Number of Elements
A work activity that I like	1
A nonwork activity that I like	1
A work activity that I dislike	1
A nonwork activity that I dislike	1
A work activity that is important to me	1
A nonwork activity that is important to me	1
A work activity that I perform frequently	1
A nonwork activity that I perform frequently	1

**Table 6.24: Element Types and Configuration for Work-People Grid**

Element Types	Number of Elements
A person who is important to me	2
A person who I like	1
A person who has my ideal role	1
A person who I dislike	1
A person who I see frequently	2
A most successful person I know	1

**Table 6.25: Element Types and Configuration for Nonwork-People Grid**

Element Types	Number of Elements
A person who is important to me	2
A person who I like	1
My ideal self	1
A person who I dislike	1
A person that I see frequently	2
Myself as a father	1

In the ultimate design of the nonwork-people grid the elements *my ideal self* and *myself as a father* were deliberately separated in case their contiguity affected the ratings of them. The intention was not to eliminate parallelism that might occur in terms of the construction of these roles but to ensure that they were not inadvertently contrived. Subsequently it was observed that some participants construed the ideal self and self as father in similar terms particularly before the birth of the baby.

Several other issues required resolution. These are discussed below.

### **The Presentation of Triads**

It was decided to standardise the sequence of triads presented by using a random number table to generate triads of elements. Thus, a table of 56 triads was constructed and used to select triads for the elicitation of each grid.

### **Redesigning the Form**

The form used to record the grids was redesigned as an eight by eight table with provision for recording the elements, the triad used to elicit each construct, the emergent and implicit poles of the constructs, and the ratings. The lines used to separate the elements were drawn at an angle. This eliminated the need to rotate the

form through 90 degrees in order to read the elements before rating them. The form also included a provision for recording a code to identify the case to which the grid related and the particular grid. A facsimile of the form is attached in appendix VI.

### **Ellipses**

The idea behind recording elements on index cards was to make it easier for participants to construe triads by placing the relevant three cards in front of them. It was envisaged that this would stimulate greater involvement of the participants. The index cards did not work well because of their shape and colour. They were too large and cumbersome to manipulate, their colour was cold and it was difficult to read the elements even if they were printed in ink pen because of the lines on the cards. Consequently it was decided to abandon the index cards and search for an alternative.

It was decided that whilst cards would be used they would be plain, of different shape, and they would not be white in colour. Subsequently the ellipse shape was chosen. The reasons for choosing the ellipse were that the shape was appealing to the touch, easy to move around on a flat surface, and to hold in the hand. A printer was contacted who showed the researcher a catalogue of colours and paper stock. One of the colours in the catalogue was a vivid yellow that was warm and inviting. It was decided that this would be the colour to use for ellipses. A judgement was made as to the size of the ellipses by using the criteria that they be large enough on which to write a number of words with a black marker but not too big as to become cumbersome. Another consideration was to minimise wastage when the ellipses were cut from paper stock. The paper chosen for the ellipses was slightly heavier than the weight of the paper used

in a manila folder and had a textured surface. A sample batch was ordered for evaluation.

### **Black Markers for Recording Elements**

A quantity of black markers slightly smaller in gauge than a normal texta pen was purchased. It was envisaged that these would be easy to write with but not so heavy in gauge as to significantly reduce the usable area of the ellipses. A black marker would produce a maximal contrast against the yellow background of the ellipses. A number of these were purchased for evaluation.

The ellipses and the black markers were trialled and feedback was sought in a research workshop (Anderson, Goold & Petter 1994) that was organised to evaluate a cognitive mapping method developed by Eden (1989) and elaborated in detail by Ackermann, Eden and Cropper (1992). The feedback from the group members was positive. Subsequently an order was placed with the printer for a large quantity of ellipses. It was also decided that in subsequent interviews participants would write down the nominated elements on the ellipses whilst the researcher would write the elements on the repertory grid form. This proved to be a good innovation, as participants became more involved and interested in the elicitation process. It also helped to maintain their concentration.

### **The Order of Elicitation of Grids**

It was decided that all grids would be elicited in the following order, the work-nonwork activities grid first, followed by the work-people grid, and finally the nonwork-people grid. The reason was that it would be easier to convey the essence of the method to participants by asking them to construe their activities first, and then move to the people

related grids. This order of elicitation also helped to develop rapport, which was important once, the interview progressed to personal matters.

### **Tracking Documents**

When designing the study a coding system was devised so that the researcher could identify each case without recording any detail that may have identified the participant. As each of the participants were recruited they were assigned a number. When the first interview was scheduled all documentation was coded with that number, a number to signify that this would be the first interview and the date of the first meeting. For example, the participant whose number was 01 was first interviewed on 09/01/95. Thus the code used for his case was 01/1/09/01/95. The first two digits are the participant number, the third represents the interview number one or two, whilst the last six digits show the date when the interview took place. When the second interview was scheduled all of the documentation was coded in a similar fashion. Thus when the first participant was interviewed again the code was 01/2/01/12/95. Each of the grids was coded in the same way with an additional code that allowed the researcher to identify which of the grids was represented on a particular form. For example the first grid (the work-nonwork activities grid) elicited from participant 01 was coded 01/1/09/01/95/1. The last digit signifies that this was the first grid elicited. At the second interview each of the grids would be rated again. Thus the second work-nonwork activities grid for participant 01 was coded 01/2/01/12/95/1. This coding scheme ensured that the identifications were unique to each participant and across occasions.

### **Tracking Data Files**

The questionnaire data were recorded in an SPSS data file. Each case was identified by the two-digit code that allocated to each participant when they were recruited. The variables were coded and other manipulations effected within SPSS to facilitate

comparisons of data collected at the first interview with data collected at the second interview.

The grids elicited from each participant were used to create data files for the FUZZYGRID program. In order that these data files could be uniquely identified another coding scheme was devised. Thus, the first grid elicited from participant 01 was coded 0111.dat. The first two digits identify the case, the second digit indicates that the data relate to the first interview, and the third indicates that it is the first grid, that is the work-nonwork activities grid. The same grid rated during the second interview was coded 0121.dat. Only the third digit is different, to signify that this is the work-nonwork activities grid, which relates to the second interview.

### **Outcomes of the Revisions**

In a subsequent interview it was found that the elicitation process was greatly improved. The decision to use three grids and the revision of the protocol for eliciting constructs proved successful. Therefore it was decided that the main study could be commenced using the revised design. Whilst ongoing experience in the elicitation process was a factor which increased the quality of elicited data, had the revisions not been made the quality of the process would have been compromised. Of all the revisions made the most important were electing to elicit three grids, and formulating an appropriate set of elements for each of them. The other modifications further enhanced the process.

The coding scheme and the protocols for naming data files protected the identity of the participants. It streamlined the management of the documentation and data related to the research. All of the documentation for each case was kept in a separate manila

folder, which was also coded according to the participant number and the date of the first interview. If any document became dislodged from a folder it could be identified and returned to the correct folder. Thus the coding scheme also helped to ensure the integrity of the data. An independent person assisted the researcher to validate the data. All of the entries in the SPSS data file were checked against the questionnaire responses, which were called by the researcher. Similarly, the entries in each of the grid data files were checked as the ratings were called from the grid forms by the researcher. Backup copies of all data files were made and stored on external media.

### **Analysing Grids with the Fuzzy-PCP Model**

Subsequently attention was focused again on achieving the third phase in the development of an analytical method for the repertory grids. It was shown in chapters 3 and 4 that the representation of grids as fuzzy entities was achievable, as was the generation of global measures of similarity for the constructs and the elements. Similarity measures for the construct pairs and the element pairs were also available. However there was a need to take the analysis further in order to produce graphical output and goodness of fit statistics. Thus investigations were undertaken to identify a method that could be dovetailed with the results produced by FUZZYGRID. Ultimately, Multidimensional Scaling Analysis was incorporated as the third component of the analytical method used for the grid data. In this section another case study is reported which demonstrates how this was achieved.



### Case 3: David and Victoria

#### Introduction

David participated in the first study but was only interviewed once. During the interview he confided that problems had arisen between himself and his partner Victoria. This resulted in a separation immediately prior to the interview. However despite his personal difficulties David said that he would like to make a contribution to the research. Thus it was mutually agreed to continue the interview.

Biographical details for David and Victoria are shown below.

Table 6.26: Biographical Data for David and Victoria

Variable/Attribute	David	Victoria
Age	37	38
Occupation	Business Analyst	Public Servant
Highest Educational Qualification	Honours degree	PhD
Job Status	Non managerial	Senior manager

David had originally trained in the humanities but had returned to full-time study to complete a degree in information systems. The student life and the milieu that surrounded it appealed to him. It had facilitated his involvement with things intellectual. At the time of the first interview he had been working as a business analyst for less than one year.

It appeared that his return to the workforce had not been easy for him. David was a reflective person who when asked to respond to *Who am I?* wrote:

- A pilgrim;
- A searcher for meaning;
- A movement between two infinities;
- A need;
- A love.

None of the other participants in the research described themselves in such a complex way.

When asked to describe the similarities and differences between his work and nonwork life he responded that they were:

Similar in that they involve intellectual work, different in that my nonwork life is concerned with more humane questions like ancient languages and literature rather than today's ephemeral technological questions.

When was asked to indicate his work needs he wrote:

Pragmatic: to pay the bills etc.

Personal: to exercise the mind, impose discipline, and be creative.

Thus advancement and money did not appear to be motivators for David. His focus at work and away from it was on the intellectual.

### **David's Work-Nonwork Activities Grid**

The work-nonwork activities grid elicited from David exemplifies this theme of the intellectual. This grid is shown below.

Table 6.27: David's Work-Nonwork Activities Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Pleasant	1.0	1.0	0.1	0.1	1.0	0.9	0.2	0.9	Unpleasant
$\bar{C}_2$ : Meaningful	0.9	0.9	0.1	0.1	0.9	0.8	0.2	0.9	Meaningless for me
$\bar{C}_3$ : What is new	0.9	1.0	0.2	0.2	0.9	0.8	0.4	0.9	Boring
$\bar{C}_4$ : Quality	0.9	0.9	0.1	0.1	0.9	0.8	0.2	0.9	Poor Quality
$\bar{C}_5$ : Structured	0.9	0.1	0.5	0.9	0.1	0.2	0.3	0.8	Haphazard
$\bar{C}_6$ : Long-suite	0.8	0.8	0.1	0.1	0.8	0.7	0.5	0.9	Weak-side
$\bar{C}_7$ : Enjoyable	1.0	1.0	0.1	0.1	0.9	0.8	0.2	0.9	Not-enjoyable
$\bar{C}_8$ : Introverted	1.0	0.9	0.1	0.1	0.9	0.7	0.2	0.9	Extroverted
Element Type							Nominated Activity		
$e_1$ : (a work activity that I like)							Problem solving		
$e_2$ : (a nonwork activity that I like)							Discovering things		
$e_3$ : (a work activity I dislike)							Meetings		
$e_4$ : (a nonwork activity I dislike)							Shopping		
$e_5$ : (a work activity which is important to me)							Creativity		
$e_6$ : (a nonwork activity which is important to me)							Good conversations		
$e_7$ : (a work activity which I engage in frequently)							Computer browsing		
$e_8$ : (a nonwork activity which I engage in frequently)							Reading		

The grid is a fuzzy entity  $\tilde{G}$ . The emergent poles of the constructs shown in the leftmost column are names for fuzzy-construct subsets  $\bar{C}_i$ . An asterisk next to the implicit pole of a construct signifies that it has been reversed. That is the poles have been swapped and the ratings reversed. This notation is shown in all grids from this point on.

Procedure 1 in the model requires that  $\tilde{G}$  be transposed. The transposed grid  $\tilde{G}^t$  is shown below.

**Table 6.28: Transposed Work-Nonwork Activities Grid for David**

Fuzzy Subsets Elements/Constructs	$\tilde{C}_1$	$\tilde{C}_2$	$\tilde{C}_3$	$\tilde{C}_4$	$\tilde{C}_5$	$\tilde{C}_6$	$\tilde{C}_7$	$\tilde{C}_8$
$\tilde{E}_1$	1.0	0.9	0.9	0.9	0.9	0.8	1.0	1.0
$\tilde{E}_2$	1.0	0.9	1.0	0.9	0.1	0.8	1.0	0.9
$\tilde{E}_3$	0.1	0.1	0.2	0.1	0.5	0.1	0.1	0.1
$\tilde{E}_4$	0.1	0.1	0.2	0.1	0.9	0.1	0.1	0.1
$\tilde{E}_5$	1.0	0.9	0.9	0.9	0.1	0.8	0.9	0.9
$\tilde{E}_6$	0.9	0.8	0.8	0.8	0.2	0.7	0.8	0.7
$\tilde{E}_7$	0.2	0.2	0.4	0.2	0.3	0.5	0.2	0.2
$\tilde{E}_8$	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9

Using (3.35) and (3.36)  $\alpha$ -level sets are created by decomposition. These can be used to indicate the similarity of constructs. The  $\alpha$ -level sets for  $\alpha_{0.20}$  and  $\alpha_{0.90}$  are shown in Tables 6.29 and 6.30.

**Table 6.29: David's Work-Nonwork Constructs as Level-Sets ( $\alpha_{0.20}$ )**

$\alpha_{0.20}$	$C_1$	$C_2$	$C_3$	$C_4$	$C_5$	$C_6$	$C_7$	$C_8$
$E_1$	1	1	1	1	1	1	1	1
$E_2$	1	1	1	1	0	1	1	1
$E_3$	0	0	1	0	1	0	0	0
$E_4$	0	0	1	0	1	0	0	0
$E_5$	1	1	1	1	0	1	1	1
$E_6$	1	1	1	1	1	1	1	1
$E_7$	1	1	1	1	1	1	1	1
$E_8$	1	1	1	1	1	1	1	1

Table 6.30: David's Work-Nonwork Constructs as Level-Sets ( $\alpha_{0.90}$ )

$\alpha_{0.90}$	$C_1$	$C_2$	$C_3$	$C_4$	$C_5$	$C_6$	$C_7$	$C_8$
$E_1$	1	1	1	1	1	1	1	1
$E_2$	1	1	1	1	0	0	1	1
$E_3$	0	0	0	0	0	0	0	0
$E_4$	0	0	0	0	1	0	0	0
$E_5$	1	1	1	1	0	0	1	1
$E_6$	1	0	0	0	0	0	0	0
$E_7$	0	0	0	0	0	0	0	0
$E_8$	1	1	1	1	0	1	1	1

At each alpha level construct consensus is estimated by embedding level sets for each construct in Hard Matrices  $H_{\alpha_i}^c$  and comparing these with one another two at a time to assess the agreement between them. The measured level of agreement for the construct pairs at each alpha level is stored in Consensus Matrices  $C_{\alpha_i}^c$ . Aggregate measures of construct relatedness are determined from these.

In Table 6.29 it may be seen that at  $\alpha_{0.20}$  the predominance of unit entries which reside in corresponding cell addresses is reflected by a significant degree of similarity between the constructs. The pattern of entries is identical for  $C_1$ ,  $C_2$ ,  $C_4$ ,  $C_6$ ,  $C_7$  and  $C_8$  and the consensus coefficient  $K_{0.20}^c = 0.63$ . As shown in Table 6.30 at  $\alpha_{0.90}$  the pattern of entries is identical for  $C_2$ ,  $C_3$ ,  $C_4$ ,  $C_7$ , and  $C_8$ . However, although the unit entries in each of these columns occupy the same relative cell address, the number of unit entries are reduced such that and  $K_{0.90}^c = 0.43$ .

Table 6.31 shows the construct consensus values  $K_{\alpha_i}^c$  for the work-nonwork constructs when the step size is 0.1.

**Table 6.31: Construct Consensus by Alpha Value**

Alpha Values $\alpha_i$	Construct Consensus $K_{\alpha_i}^c$
0.00	1.00
0.10	1.00
0.20	0.63
0.30	0.57
0.40	0.57
0.50	0.64
0.60	0.75
0.70	0.75
0.80	0.54
0.90	0.43
1.00	0.01

The table shows that when  $\alpha_i$  is between 0.10 and 0.40 the  $K_{\alpha_i}^c$  values decrease monotonically. At  $\alpha_{0.50}$  there is an upward inflection such that the  $K_{\alpha_i}^c$  values increase until  $\alpha_{0.60}$  at which the  $K_{\alpha_i}^c$  values again decrease. The pattern of construct consensus values is shown in Figure 6.1.

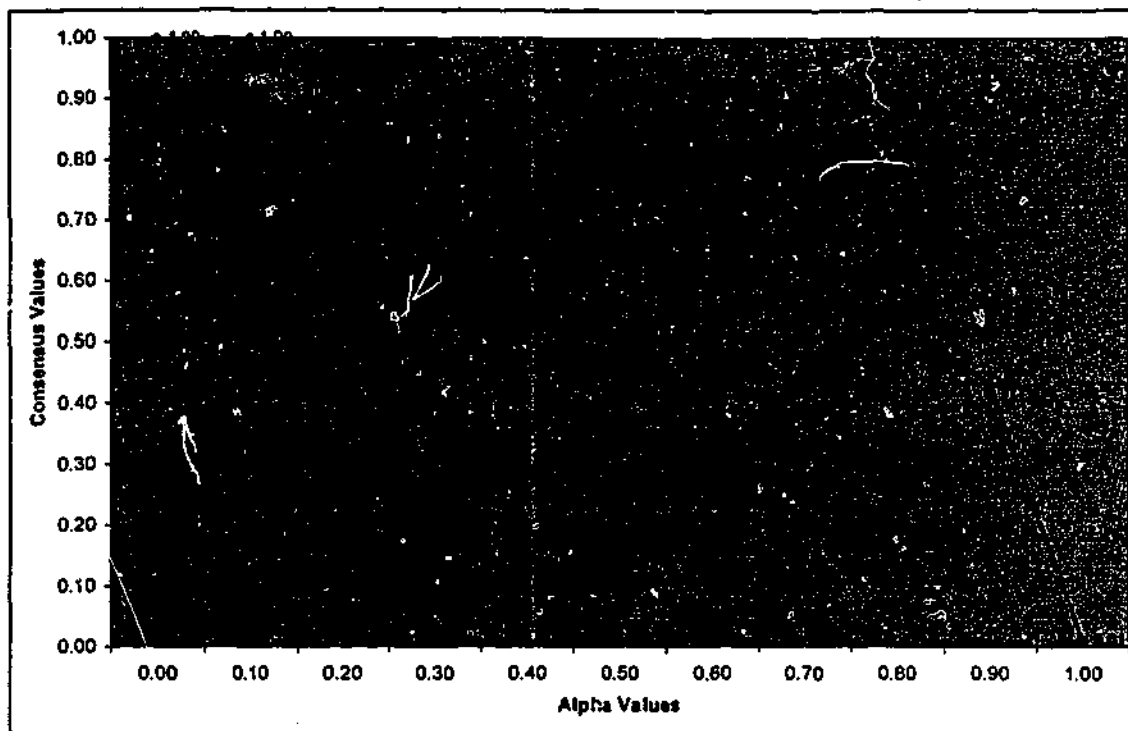


Figure 6.1: Construct Consensus by Alpha Value

The upward inflection shown in the graph at  $\alpha_{0.50}$  was not surprising. The agreement between construct pairs at each  $\alpha_i$  is a function not only of the number of unit entries in a hard matrix but also their position relative to those in another. Thus, whilst there may be fewer unit entries in two hard matrices when alpha is increased, more of them may occupy corresponding cell addresses. This means that for construct pairs the agreement values can increase even though alpha is increased. Since these form the elements of the consensus matrices from which consensus coefficients are derived, the measured level of construct consensus can also increase when alpha is increased. This is demonstrated by examining the entries in the Construct Consensus Matrices  $\mathbf{C}_{0.40}^c$  and  $\mathbf{C}_{0.50}^c$  for the grid. These are shown in Table 6.32 below.

Table 6.32: Construct Consensus Matrices at Different Alpha values

$\alpha_{0.40}$	$C_1$	$C_2$	$C_3$	$C_4$	$C_5$	$C_6$	$C_7$	$C_8$
$C_1$	0.00	1.00	0.69	1.00	0.11	0.69	1.00	1.00
$C_2$	1.00	0.00	0.69	1.00	0.11	0.69	1.00	1.00
$C_3$	0.69	0.69	0.00	0.69	0.08	1.00	0.69	0.69
$C_4$	1.00	1.00	0.69	0.00	0.11	0.69	1.00	1.00
$C_5$	0.11	0.11	0.08	0.11	0.00	0.08	0.11	0.11
$C_6$	0.69	0.69	1.00	0.69	0.08	0.00	0.69	0.69
$C_7$	1.00	1.00	0.69	1.00	0.11	0.69	0.00	1.00
$C_8$	1.00	1.00	0.69	1.00	0.11	0.69	1.00	0.00
$\alpha_{0.50}$		$C_2$	$C_3$	$C_4$	$C_5$	$C_6$	$C_7$	$C_8$
$C_1$	0.00	1.00	1.00	1.00	0.11	0.69	1.00	1.00
$C_2$	1.00	0.00	1.00	1.00	0.11	0.69	1.00	1.00
$C_3$	1.00	1.00	0.00	1.00	0.11	0.00	1.00	1.00
$C_4$	1.00	1.00	1.00	0.00	0.11	0.69	1.00	1.00
$C_5$	0.11	0.11	0.11	0.11	0.00	0.08	0.11	0.11
$C_6$	0.69	0.69	0.00	0.69	0.08	0.00	0.69	0.69
$C_7$	1.00	1.00	1.00	1.00	0.11	0.69	0.00	1.00
$C_8$	1.00	1.00	1.00	1.00	0.11	0.69	1.00	0.00

The shaded areas in the second portion of the table indicate those cells for which the agreement coefficients have changed. The lighter shading indicates those construct pairs for which the agreement values have increased. The darker shading indicates those construct pairs for which the agreement values have decreased. Since in the aggregate the magnitude of the increases exceeds the magnitude of the decreases, the measured level of consensus increased from 0.57 to 0.64 even though alpha increased from  $\alpha_{5,0.40}$  to  $\alpha_{6,0.50}$ .



## Multidimensional Scaling for Further Resolution of Grid Data

Shown below is the similarity matrix  $S^c$  for the construct pairs produced by FUZZYGRID for David's work-nonwork activities grid.

Table 6.33: The Similarity Matrix for David's Work-Nonwork Constructs

Constructs	$\tilde{C}_1$	$\tilde{C}_2$	$\tilde{C}_3$	$\tilde{C}_4$	$\tilde{C}_5$	$\tilde{C}_6$	$\tilde{C}_7$	$\tilde{C}_8$
$\tilde{C}_1$	0.00	0.94	0.85	0.94	0.41	0.80	0.95	0.91
$\tilde{C}_2$	0.94	0.00	0.88	0.97	0.41	0.80	0.97	0.94
$\tilde{C}_3$	0.85	0.38	0.00	0.88	0.44	0.82	0.88	0.85
$\tilde{C}_4$	0.94	0.97	0.88	0.00	0.41	0.80	0.97	0.94
$\tilde{C}_5$	0.41	0.41	0.44	0.41	0.00	0.41	0.41	0.41
$\tilde{C}_6$	0.80	0.80	0.82	0.80	0.41	0.00	0.80	0.83
$\tilde{C}_7$	0.95	0.97	0.88	0.97	0.41	0.80	0.00	0.95
$\tilde{C}_8$	0.91	0.94	0.85	0.94	0.41	0.83	0.95	0.00

A visual inspection of this matrix suggests that constructs 1, 2, 3, 6, 7 and 8 are strongly interrelated. Construct 5 appears to be isolated from this group. However whilst similarity matrices such as the one above are suggestive of the form underlying the grids, visual inspections are not a sufficient basis for inference. Thus further research was undertaken, to determine if the results produced by FUZZYGRID could be used to extend the data analysis, and provide graphical output from which underlying structures could be inferred.

The traditional methods of grid analysis are metric and non-metric factor analysis, principal component analysis and metric and non-metric multidimensional scaling. Each of these methods is a data reduction technique, the objective being to simplify data by identifying factors or dimensions from a data matrix of similarities or dissimilarities (Shaw 1980, p. 120). In practice, principal components analysis is the first step in factor analysis known as *extraction*. The second step known as *rotation* is used to transform

component loadings in a way that is intended to make them easier to interpret (Cliff 1987, p. 319).

### Dissimilarity Matrices

For MDS the input is usually a *dissimilarity matrix*  $\mathbf{D}$  whose elements are *proximity coefficients* which show the amount of difference between each pair of stimuli (Schiffman, Reynolds & Young 1981, p. 9). According to Gordon (1980, p. 14) three conditions must be satisfied in order that difference matrices be called dissimilarity matrices. These are:

$$(a) d_{i,j} \geq 0 \quad \forall i, j \in \mathbf{D} \quad (6.1)$$

$$(b) d_{i,j} = 0 \quad \forall i, j \in \mathbf{D} \quad (6.2)$$

$$(c) d_{i,j} = d_{j,i} \quad \forall i, j \in \mathbf{D} \quad (6.3)$$

The first condition states that differences cannot be negative. The second condition is that the difference between an element  $d_{i,j}$  and itself must be zero. Thus all the entries on the main diagonal must have a zero coefficient. The third condition states that the elements in  $\mathbf{D}$  must be symmetric. The entries in  $i, j$  must be the same as the entries  $j, i$  for all  $i \neq j$ . Taken together conditions two and three mean that the dissimilarities between a set of  $n$  objects (constructs or elements) can be completely specified by a lower triangular matrix of  $n(n-1)/2$  with differences  $d_{i,j}$ . In the current research dissimilarity matrices were derived by performing a transformation on the elements in the similarity matrices  $\mathbf{S}^c$  and  $\mathbf{S}^e$  such that:

$$d_{i,j}^c = 1 - s_{i,j}^c, \forall i, j, i \neq j \quad (6.4)$$

$$d_{i,j}^e = 1 - s_{i,j}^e, \forall i, j, i \neq j \quad (6.5)$$

This was done by FUZZYGRID. The dissimilarity matrices produced satisfy each of the conditions above. They are formatted so that can be exported to and read directly by SPSS.

### **Spatial Maps**

Multidimensional scaling enables constructs and/or elements to be represented separately in a spatial map such that constructs or elements which are 'judged experimentally similar' are represented as proximate points whilst constructs or elements which are dissimilar are shown as disparate points (Schiffman, Reynolds & Young 1981, p. 3). The placement of the axis representing the dimensions is arbitrary such that interpoint distances are not affected by their origin or placement. Thus, in attempting to understand the underlying *form* in a map the emphasis can be on the configuration of points rather on the dimensions *per se* (Lingoes, Roskam & Borg 1979, pp. 35-6).

In contrast to MDS results a factor analysis can be difficult to interpret. Participants may feel 'bewildered and inadequate' when asked to 'peruse factor loadings, angular distances and other mathematical mysteries' (Shaw 1980, p. 124). Thus the relative ease of interpretation was an additional incentive to select multidimensional scaling as a data reduction technique. However, 'the spatial analogy can be treacherous as well as illuminating, for a cognitive structure is not simply a map, nor is it necessarily best represented spatially' (Coxon, Davies & Jones 1986, p. 91). This caveat was observed when interpreting the MDS solutions generated for the current research.

### **Metric or Non-metric MDS**

Non-metric MDS is used when the data are such that only rank order relationships are maintained, whilst metric MDS is used with interval or ratio level data (Schiffman, Reynolds & Young 1981, p. 6). In the current research participants rated the elements in the grids on a ten-point rating scale. This suggested that metric MDS be used. However Shaw (1980, p. 119) pointed to the general problem raised by the 'equal interval assumption' in the interpretation of psychological data. A test of this assumption requires that the 'same data be replicated many times'. This is not usually feasible nor was it feasible in the current research. However, the grid data were initially analysed using the Fuzzy-PCP model. Since the model recognises zones of overlap in ratings there is an implicit relaxation of the equal interval assumption. For this reason it was decided that *metric interval level MDS* would be used for the extended analysis of the grid data.

### **MDS Statistics and the Number of Dimensions**

Two measures of fit produced by MDS were used as an aid to model selection. These were *Kruskal's Stress* measure and the squared correlation coefficient *RSQ* (r-square). Stress coefficients, range from one (worst possible fit), to zero (perfect fit). *RSQ* is the squared correlation between the standardised data and the Euclidean distances generated by the scaling model (Norusis 1994, pp. 163-5). Following Schiffman, Reynolds & Young (1981, pp. 10-12) parsimony and interpretability were the criteria used when deciding on the number of dimensions to use. Simple interpretable solutions with good *RSQ* coefficients were chosen in preference to more complex models that only added marginally to the variance explained (Sekaran 1992, p. 14).

## Additional Aspects of Grid Analysis

### The Golden Section Hypothesis

Under the original dichotomous rating methods instituted by Kelly the 'a priori probability' of the assignment of elements to one or the other pole of a construct was 0.5 (Adams-Webber 1982, p. 99). Bannister and Mair (1968, p.162) argued that this form of rating scheme ensured that :

The 'obvious' was made manifest — people do not invariably divide their environmental elements half-and-half. They often "see" many more *kind* people than *cruel* ones, or many more *philistines* than *aesthetes*. Kelly gave this phenomenon the term lopsidedness.

Research has shown that 'when people categorize acquaintances dichotomously on the basis of bipolar constructs they tend to assign them to the "positive" poles 62 per cent of the time' (Adams-Webber 1982, p. 98) and to the negative poles 38 per cent of the time. This pattern of allocation of elements to the positive and negative poles of constructs approximates the "golden section" which is found by dividing a line segment AB by a point C such that the ratio  $AC:AB = CB:AB$ . If the line segment is assumed to be of unit length and  $CB = \phi$  then  $AC = 1-\phi$  and  $\phi^2 + \phi - 1 = 0$ . If this quadratic equation is solved for  $\phi$  then the positive root is approximately 0.62 (Adams-Webber 1982 p. 99).

This pattern of allocation has been found across a variety of bipolar constructs, different cultural groups and alternative methods of measurement. 'It has also been replicated with the same subjects on different occasions' (Adams-Webber 1982, p.98). It has not been confined to the sphere of interpersonal judgement but has also been observed in research on subjects working in various occupations who were asked to rate factors related to their jobs as either, positive, negative or neutral. On average the proportion of factors rated positively was 0.62 (Adams-Webber 1982, p.105).

### Classification of Construct Poles

Related to the concept of the Golden Section Ratio is the issue related to the classification of construct poles as "positive" or "negative". Adjectival pairs such as *pleasant* – ***unpleasant*** and *relevant* – ***irrelevant*** are explicitly marked by a single morphological feature (shown in bold) added to the unmarked member. In contrast the pair *long* – *short* is not explicitly marked. Adjectival pairs such as the former usually serve only a contrastive function whereas the latter can be both nominal and contrastive. In other words the construct *long* – *short* can be used to describe length or to communicate some underlying affective quality. For example a manager may expect her appraisal meeting to take a long time. If the meeting is brief she might remark "Oh!, that was a short meeting". The tone of voice and the usage of "short" in this context imply something more than a remark about the actual length of the meeting. Research has shown that the golden section ratio is applicable whether the poles of a construct are marked or unmarked. Thus on empirical grounds the rating pattern in repertory grids is expected to follow the golden section such that the ratio of allocations to the positive and negative poles is 62:38 (Adams-Webber 1982, pp. 101–5). Deviations from this ratio may indicate some redundancy in constructs. When a person who has previously construed people as either *good* or *bad* begins to see all people as good, this is 'for practical purposes, dismissing the construct and rendering it useless' since it no longer functions as a bipolar discrimination (Bannister & Mair 1968, p. 162).

In the current research the Golden Section Ratio was used to assess construct lopsidedness. It was noted that not all construct poles are explicitly marked. Judgement had to be exercised in labeling the poles of some constructs as unmarked (positive) or unmarked (negative). Moreover, given the idiosyncratic nature of construing what, one person regards as positive, might be seen as negative by another. What 'one person

means by "gentle" may correspond more closely to what others would call "dependent" or perhaps "weak" (Kelly 1955, p.116).

### **The Analysis of David's Grid**

The nature of the elements supplied by David and his use of language was striking. It reflected his orientation towards the intellectual and his background. Bernstein (1961) distinguished two types of linguistic code, *elaborated* and *restricted*. These were claimed to be typical of the middle class and the working class respectively. Similar findings were reported by Warren (1964, pp. 261-2) who found in researching two groups, one middle class and one working class, that the former exhibited a 'higher degree of conceptual structure' and were found 'to manifest more "idiosyncratic" construct patterning'. These differences were not accounted for by differences in intelligence. David's use of language was elaborate and the discriminations he used were individualistic. However, a concern arising out of the interview with David was that the measured level of construct consensus indicated that he was perhaps somewhat inflexible.

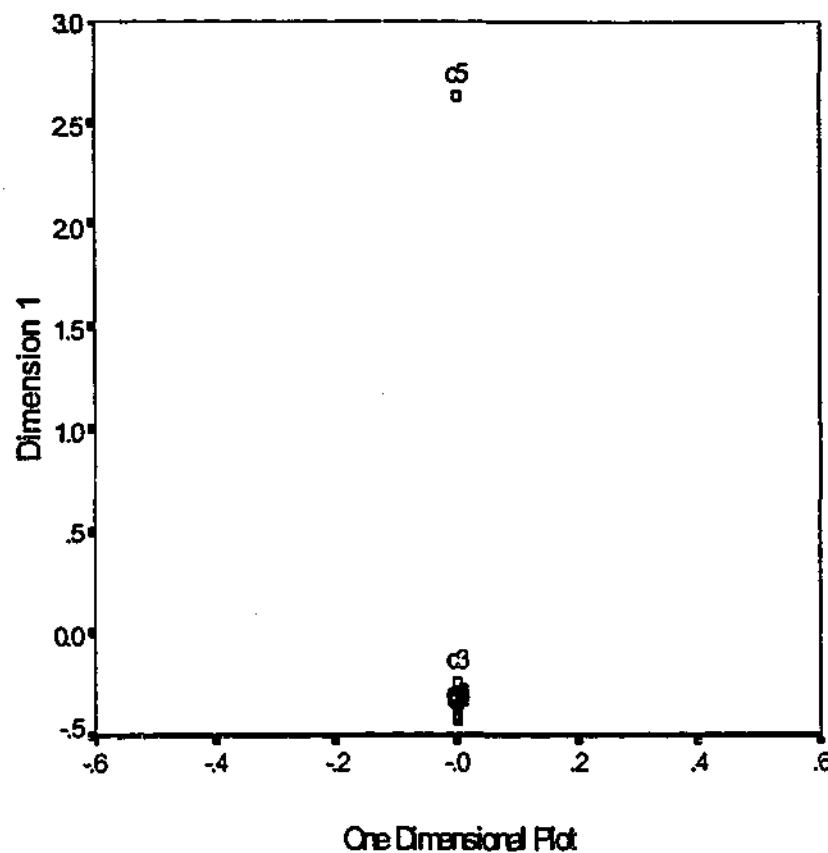
The analytical results for his grid are shown below.

**Table 6.34: Analysis of Constructs in David's Work-Nonwork Activities Grid**

Constructs		
1. <i>pleasant – unpleasant</i>		
2. <i>meaningful – meaningless for me</i>		
3. <i>what is new – boring</i>		
4. <i>quality – poor quality</i>		
5. <i>structured – haphazard</i>		
6. <i>long suite – weak side</i>		
7. <i>enjoyable – not enjoyable</i>		
8. <i>introverted – extroverted</i>		
Golden Section Ratio 59:41		
Construct Consensus $K_G^C = 0.80$		
Model Statistics	Stress	R-Square
One dimension	0.28	0.94
Two dimensions	0.06	0.99
Three dimensions	0.03	1.00

The Golden Section Ratio was somewhat lower than was expected on empirical grounds. The consensus coefficient suggested that the underlying conceptual structure was *simple*. However in David's case this was not due to any lack of discriminative capacity but to his very strong orientation towards intellectual activities and his disdain for the routine aspects of living. Thus his preferences were 'black and white' in character. The pattern of results emanating from the MDS analysis supported the contention that the form of the underlying cognitive structure was simple. As may be seen a solution in one dimension yielded an RSQ of 0.94 and a stress coefficient of 0.28. Applying the criteria of parsimony and interpretability it was evident that more dimensions did not add significantly to the exercise. Thus the one-dimensional map was chosen for interpretation. This is shown below.





**Figure 6.2: Construct Map for David's Work-Nonwork Activities Grid**

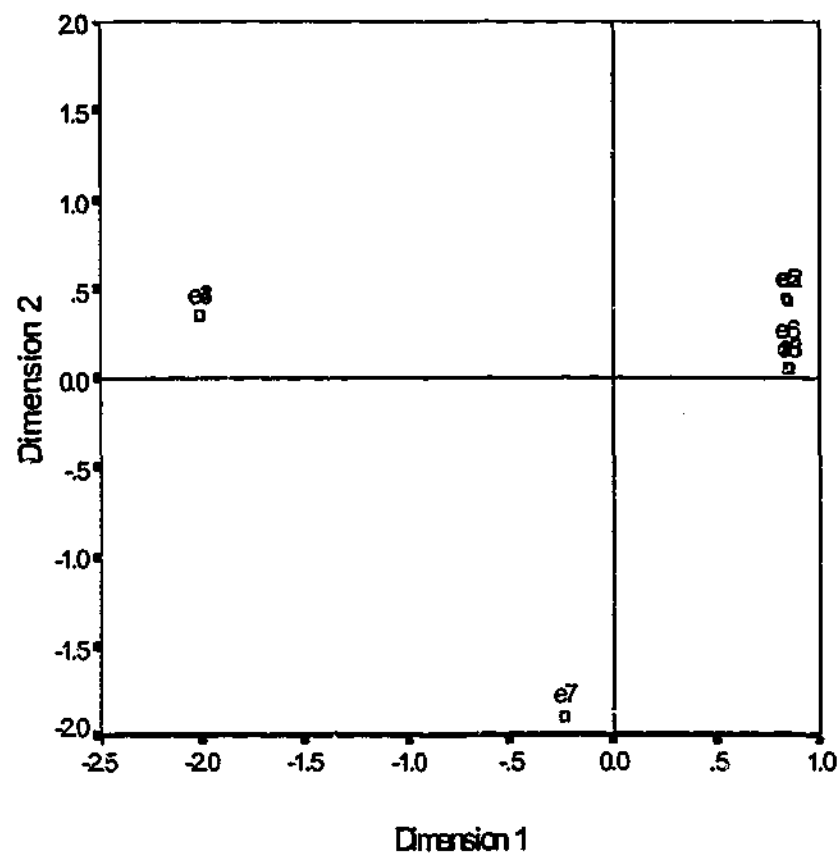
It is evident from this map that the constructs were so tightly wound that only two of them were readily distinguishable. At the top of the map the fifth construct *structured-haphazard* stands alone because it is qualitatively different from the others. The cluster at the southern end of the map is interpreted as representing David's affective (*like – dislike*) discrimination of the nominated activities, even though in terms of the construct poles affect was not immediately evident.

The MDS solution for the elements is shown below.

**Table 6.35: Analysis of Elements in David's Work-Nonwork Activities Grid**

Elements		
1. Problem solving 2. Discovering things 3. Meetings 4. Shopping 5. Creativity 6. Good conversations 7. Browsing on the computer 8. Reading		
Element Consensus $K_G^e = 0.61$		
Model Statistics	Stress	R-Square
One dimension	0.33	0.79
Two dimensions	0.19	0.95
Three dimensions	0.09	0.97

Because of the significant improvement in the model statistics between a one and two-dimensional solution, and the marginal improvement when a three dimensional solution was run, the two-dimensional MDS solution was chosen for interpretation. Although there may be a correspondence between the form observed in construct and element maps, there is no logical reason why there should be a perfect duality between them, except in the case where a repertory grid comprises rows which are identical. The element map for David's grid is presented below.



**Figure 6.3: Element Map for David's Work-Nonwork Activities Grid**

This map shows two clusters of activities that may be characterised as, those that David enjoyed, and those that were extremely disliked by him. The liked activities were (e1) *problem solving*, (e2) *discovering things*, (e5) *creativity*, (e6) *good conversations* and (e8) *reading*. Each of these is clustered together near the towards the north-east border of the map. The disliked activities were (e3) *meetings*, (e4) *shopping* and (e7) *computer browsing*. The former two are clustered towards the north-west border of the map. Computer browsing is shown at the bottom of the map is somewhat removed. The negative affect expressed by David about it was not as strong and it was more structured than the other two.

A conclusion emanating from the interview with David, from his descriptions of himself, and from the interpretation of this map, was that he was an intense person and a deep thinker who was somewhat removed from the urbane. His preference for intellectualism

appeared to have developed in him a rigidity that is reflected in the analysis presented above.

### **Conclusion**

This completes the presentation of the material for this chapter. Three objectives have been achieved. The first was the development of a template for the presentation of questionnaire data that will be used in conjunction with repertory grids to report and evaluate the cases presented in the next chapter.

The second was to demonstrate that significant modifications were made to the design of the repertory grids and the elicitation processes to maximise the potential for collecting meaningful data. It was also shown that measures were taken to protect the anonymity of participants and the integrity of all data.

The third objective was to show that the logic of the FUZZY-PCP model incorporated in FUZZYGRID would produce results suitable for further analysis using MDS. The essence of this was the generation of dissimilarity matrices for the construct and the element pairs. Thus it was appropriate that multidimensional scaling be used in conjunction with the measures generated by FUZZYGRID for further data resolution. Model statistics would provide benchmarks for the appropriate number of dimensions to use and goodness of fit indices. The graphical output would assist with interpretation. The Golden Section Ratio was used as an adjunct to these results.

At this point solutions to all but one of the methodological problems arising from the approach adopted for the current research have been presented. However, it will be

shown in the next chapter that the issue of change or stability in the form of a cognitive structure was one that required the development of a hybrid form of multidimensional scaling analysis.

## **CHAPTER 7**

### **THE MAIN STUDY**

#### **Introduction**

This chapter comprises five sections. In the first section a summary of the results generated from an analysis of the questionnaire data is presented. The detailed analysis of that data is presented in appendix IV.

In section 2 the first part of a case study is presented. The principal focus is the analysis of a repertory grid using the Fuzzy-PCP model that is embedded in FUZZYGRID. The results emanating from FUZZYGRID are used in conjunction with multidimensional scaling analysis for the further resolution of grid data.

Section 3 comprises an extensive discussion concerning the measurement stability or change in the form cognitive structures over time. A modified form of Weighted Multidimensional Scaling (WMDS) is proposed and tested using the first and second occasion data related to the grid presented in section one.

In section 4 the analytical results for two other repertory grids related to the first case are presented as are the results of the collation of the questionnaire responses for that case.

The second case is presented in section five. It represents a synthesis of the methodology developed and tested in this thesis. Two other cases are presented in appendix V.

### **Summary of Aggregate Results**

A number of trends were evident when the questionnaire data emanating from twenty-two cases were analysed. These trends are summarised below.

#### **Late Marriage**

Firstly the participants reflected the trend towards marriage at a later age. This was particularly pronounced in the case where both partners were professionals. However, it was observed that in general partners were younger than participants. This is indicative of a long-term pattern in Australia, although the proportion of women marrying for the first time, who are older than their partners has increased. In keeping with the trend towards marriage at a later age the participant couples also reflected the trend that couples are now older when they have their first child. Again the pattern was more pronounced for the twelve couples in which both partners were professionals. In these couples the participants were on average aged in their mid-thirties and their partners in their early thirties.

#### **Cohabitation**

Secondly the questionnaire data indicated that among the participant couples cohabitation was not unusual.

However, by virtue of the short durations reported it was concluded that it served not as a distinct institutional form but as a precursor to marriage. All but two of the participants who had cohabited had subsequently married their partner in cohabitation. The two who were cohabiting during the research were distinguishable in that one did not perceive any difference between cohabitation and marriage whereas the other appeared to understand it not only as a looser arrangement but also one which was indicative of a liberated approach to relationships.

### **Marrying up**

The literature indicated that marrying up was indicative of married couples. However, this was not evident to the same extent in the current research. It was observed that in just over half of the participant couples that partners had achieved lower educational standards than the participant. However, the overall level of educational achievement was quite high. Five of the married couples had achieved tertiary qualifications that were of equal standing.

### **Contributions to Household Labour**

Analysis of the data was undertaken to determine if age was a factor that may have affected the contributions of participants to unpaid work at home. A specific focus was the contribution of participants to tasks that were classified as traditional-feminine, traditional-masculine or androgynous. The purpose of this was to determine if there was any significant contribution by participants to those unpaid tasks which had traditionally been assigned to the female partner, or arrested by them as a means of protecting the domain which has been traditionally controlled by women. Using age related criteria the participants were classified as "on-time" and "late" fathers. The picture that emerged



indicated that the participants were homogeneous in relation to their contributions to the various sex based classifications of tasks around the home. The contributions by participants to the repetitive feminine tasks were found to be minimal irrespective of whether they were on-time or late fathers. Moreover, there was little variation in the level of contribution across all of the nominated sex based categories. This was indicated by the responses supplied to the same questions asked about household at the second interview.

Since the age related data indicated homogeneity among the participants, the data were further interrogated using another criteria as a basis for partitioning that data. The participants were classified into categories according to a judgment made about their sex-role orientation. The analysis subsequently focused on two subgroups, androgynous and masculine, and further analysis across a range of areas was undertaken beginning with contributions to unpaid household work.

The analysis revealed that for the first occasion data those classified as androgynous made a significantly greater contribution to tasks classified as traditional-feminine in comparison to participants classified as masculine. Data collated in connection with attitudes towards women corroborated a judgment that those in the androgynous subgroup were more proactive in making contributions at home. However for the second occasion data a significant difference between the subgroups was found. An interpretation was made that after the birth of the baby those in the masculine subgroup were required to make greater contributions at home because of the demands placed on the partner after the arrival of the first child. Thus, although in many of the couples' roles were somewhat polarised along traditional lines such that the partner remained at

home whilst the participant continued in paid work and maintained relatively high working hours, additional contributions were required at home.

### **The Provider Role**

A significant finding in the current research was that the provider role did not appear to dominate the participants perceptions of the role of father. Rather it was uncovered that expressive themes of affiliation, support, and the notion of the father as a role model and teacher, predominated in the self-descriptions provided by participants. However, it was observed that in cases where the provider role was mentioned the participants reflected a view of themselves as responsible for the provision of material comfort for their partner and child.

### **Commitment to Work**

The data indicated that at the level of the participant group commitment to the work domain was not affected by the birth of the baby. However, a pattern observed in the second occasion data was that irrespective of the movement in the reported level of commitment to their jobs some participants maintained or increased their working hours following the birth of the baby. In those cases the partners were not employed in the paid workforce. Thus financial exigencies may explain this pattern of behaviour particularly when marriage and family life were widely reported as most salient on both occasions. However, despite the high salience of family life reported by both masculine and androgynous participants, analysis of the contribution to babycare indicated that the latter made a significant contribution and the difference was most marked in connection with night tending of the baby. Androgynous participants were more willing to share this task with their partner.

### **The Transition to Fatherhood**

The transition to fatherhood was evaluated in connection with its impact on the relationship characterisation as reported by participants. It was found that partnership emerged as a more prominent aspect of relationship characterisation following the birth of the baby but that the increase was not a significant one. The data also indicated that although relationship satisfaction decreased after the birth of the baby the decrease was not significant. A significant deterioration in relationship quality was detected in only one case. Evidence in support of the contention that relationship quality was not deleteriously affected by the transition to fatherhood was also found in the scores on the spouse relations subscale of the Parenting Stress Index which were not indicative of significant relationship stress. Similarly when asked to rate the stress that they had felt in connection with their relationship since the birth of the baby participants did not report high stress ratings.

None of the scores reported for masculine and androgynous groups on the subscales of the Parenting Stress Index were indicative of an abnormal level of difficulty in the parenting role. Other responses collated about the difficulty of the transition, the stress of being a father and overall stress since the baby was born were supportive of this inference. A factor that may explain this is that in all but five cases the participants had planned to have a child, and in those five where the birth was not planned four of them were not at all unhappy about the prospect of becoming parents. The usual responses in those cases were coined in terms of wanting to wait a bit longer but the intention and motivation to become parents was clear.

The first case study in this chapter appears below.

### **Case 4: Peter and Maria**

#### **Introduction**

When first interviewed, Peter and Maria were living in a northern suburb of Melbourne. They were in their second year of marriage and living in a house provided by Maria's parents. They had purchased a block of land in the outer suburbs and were saving in order to commence building their own home. There was a feeling from Peter that living in a house provided for him compromised his independence. When the second interview was conducted he and Maria had moved to another address. Peter was exceptional and consistent in his endorsement of fatherhood. He stood out from all but one other participant because of his awareness of the benefits and obligations that it bestowed on him.

Biographical information about Peter and Maria is shown below.

**Table 7.1: Biographical Data for Peter and Maria**

Variable/Attribute	Peter	Maria
Age	31	26
Occupation	No response	Beauty therapist
Highest Educational Qualification	Honours degree	TAFE qualification
Job Status	Non-managerial	Self-employed

Aged 31 Peter conveyed concerns about his future and there was a hint of regret about the direction his formal studies had taken. His tertiary qualification was in theology. Thus he had difficulty gaining professional employment.

Peter indicated some frustration with his job as a factory hand doing what appeared to be a menial job. He did not provide a response to the question, *What is your occupation?* He spoke about his desire to pursue studies in computing or a related area since he enjoyed working with computers and had an aptitude for them. However, it appeared that in the short term this was not an option for him.

### **Descriptions of Self and Ideal Self**

Peter's responses to the question *Who am I?* were:

- I am a dad, husband, happy male;
- A person with responsibility, purpose, desire;
- A sense of achievement, someone with a family of my own to live for.

From these responses it was inferred that before the birth of the baby Peter had strongly identified with his role as a father and was well prepared for the changes that were afoot.

Peter's depiction of his ideal self provided at the second interview is shown in Table 7.2.

**Table 7.2: Peter's Descriptions of his Ideal Self**

Word/Phrase	Rankin	Rating
Fulfilled	1	10
Always calm	2	4
Always patient	2	4
Caring	2	9
Helpful	3	10
Rich	4	8
Influential	4	8

Based on these responses Peter could have been typed as feminine or perhaps androgynous. However his scores on the PAQ which were 21 for the masculine and 20 for the feminine subscales resulted in him being typed as masculine.

Since these scores were close to the median benchmarks the type ascribed to him was weighed against indications that emanated from the interviews. A judgement was made that he was probably a masculine type but not overtly so. Peter's attitudes and behaviour appeared to be tempered by his Christian values and a strong and longstanding commitment to the congregation to which he and his wife belonged.

## The Repertory Grids

### Peter's Work-Nonwork Activities Grid

The first grid elicited from Peter related to work-nonwork activities is shown below.

**Table 7.3: Peter's Work-Nonwork Activities Grid**

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Pleasure	0.5	1.0	0.0	0.7	0.4	0.7	0.0	1.0	To do with work
$\bar{C}_2$ : Productive	0.3	1.0	0.0	0.6	0.8	0.7	0.0	0.9	Time wasting
$\bar{C}_3$ : Doesn't have to be done	0.1	0.0	1.0	0.1	0.0	0.3	0.9	0.3	Has to be done
$\bar{C}_4$ : For my wife	0.7	1.0	0.0	1.0	0.7	0.7	0.0	0.6	Anti-enjoyment
$\bar{C}_5$ : Every day thing	0.5	0.0	0.7	0.5	0.5	0.2	0.9	0.5	High priority
$\bar{C}_6$ : Not compulsory	0.0	0.0	0.8	0.5	0.0	0.2	0.9	0.3	Important
$\bar{C}_7$ : Related to home	0.0	1.0	0.5	1.0	0.0	1.0	0.0	0.5	Related to work
$\bar{C}_8$ : Enjoy	0.9	1.0	0.0	0.5	0.8	0.9	0.0	1.0	Hate
Element Types					Nominated Activities				
$e_1$ : (a work activity that I like)					Fork Lift driving				
$e_2$ : (a nonwork activity that I like)					Quality time with my wife				
$e_3$ : (a work activity that I dislike)					Wasting time				
$e_4$ : (a nonwork activity that I dislike)					Washing dishes				
$e_5$ : (a work activity that is important to me)					Operate and run machines				
$e_6$ : (a nonwork activity that is important to me)					Cutting grass and organising the yard				
$e_7$ : (a work activity that I perform frequently)					Stripping cut sheets				
$e_8$ : (a nonwork activity that I perform frequently)					Working on the computer				

### Commentary on the Grid

As mentioned earlier in this thesis when constructs were elicited from participants they were asked to rate them on the interval [0,10] in the following manner. A rating of zero meant that an element was anchored to the left pole and a rating of 10 meant that an element was anchored to the implicit right pole. Subsequently these ratings were transformed to decimals on [0,1] and reversed such that the ratings were conformable

with the representation of the constructs as *fuzzy construct subsets* named according to the left pole. This reversal of ratings was an explicit application of the complementary rule for fuzzy construct subsets as presented and discussed in equation (3.23) in chapter 3. It was predicated on the understanding that constructs were bipolar dimensions of similarity and contrast and that the poles need not be apposite such as *black – white* to be interpreted as such. It may be seen that in the grid above only construct eight, *enjoy – hate* is apposite in form.

The preliminary analysis of Peter's grid indicated that there were two underlying drivers in relation to his construing of work and nonwork activities. The first was an affect that was most clearly indicated by construct eight *enjoy – hate*. However, although less explicit, affect was also implicated in construct one *pleasure – to do with work*, construct two *productive – time wasting*, and construct four *for my wife – anti-enjoyment*.

The second driver appeared to be a sense of discretion versus obligation voiced by Peter in relation to activities at home and at work. This was indicated by construct three *doesn't have to be done – has to be done*, construct five *every day thing – high priority* and construct six *not compulsory – important*.

In the grid construct seven *related to home – related to work* was interpreted as distinct from all of the others in that it was employed to identify the domain in which the nominated activities were carried out. It may be seen that with the exception of the third element *wasting time* and the eighth element *working on the computer* the ratings for every other element on this construct were polar  $\{0,1\}$  such they were construed as either *related to work* or *related to home*.



From Peter's demeanor it was evident that he was an organised person. Thus, it was not surprising that he nominated wasting time as a disliked work activity but also that this affect would span both the work and nonwork domain. Similarly whilst he spent his leisure time working on his computer at home, computers were also related to his work environment. Thus the ratings of 0.5 for each of these elements indicates that they spanned both domains.

### Analysis of the Work-Nonwork Grid

The Golden Section ratios and consensus coefficients generated for this grid by FUZZYGRID are shown below.

Table 7.4: Consensus Coefficients for Peter's Work-Nonwork Activities Grid

Measure	First Occasion	Second Occasion
Construct Consensus	0.48	0.50
Element Consensus	0.42	0.50
Golden Section Ratio	51:49	59:41

The consensus coefficients suggested that the constructs were not tightly bound. Similarly there appeared to be differentiation in the element set. The coefficients were also quite stable for the constructs and the elements given that the time interval between the first and second interview was almost nine months. Whilst the Golden Section Ratios were lower than what was expected on empirical grounds, they were not interpreted as indicative of a person with an unduly negative outlook. Based on other empirical evidence one expectation though not a rigid one was that the ratios would be in the order of 62:38 (Adams-Webber 1982, p. 98). The Golden Section ratio was also used for other purposes as explained below.

## **Additional Applications of the Golden Section Ratio**

The Golden Section Ratio was also employed as a pointer to:

- (a) Construing which was strongly oriented towards "negative" (right) poles.
- (b) A significant change in outlook between occasions such that ratings on the opposite (negative versus positive or positive versus negative) poles were more pronounced on the second occasion.

In relation to point (a) it was necessary to establish at the outset whether "negative" construing was a feature of a grid since measures of construct relatedness would be biased downwards if this were the case. This would occur because construct relatedness was measured according to membership values of fuzzy construct subsets defined in terms of the left-hand ("positive") poles of constructs. If negative construing dominated any grid then the membership values for the fuzzy construct subsets would be low, thus reducing the measured degree of construct relatedness. This meant that a simple form of cognitive structure might be proposed when a negative disposition of undetermined complexity was the underlying form in the cognitive structure represented by a grid. Thus, if a grid exhibited strong negative construing then the appropriate course of action was to measure construct relatedness in terms of the fuzzy construct subsets defined according to the negative poles of the constructs.

In this connection it was also necessary to distinguish between right-hand poles that were affect negative from right-hand poles that were affect positive, and also left-hand poles that were affect positive from left-hand poles that were affect negative. Thus where necessary, constructs were reversed so that what were judged to be "negative" poles were located on the right side of the grids, and what were judged to be "positive" poles were located on the left side of the grids. Only then was an election made about

whether to measure construct relatedness according to ratings on the left-hand or right-hand poles.

It may be seen that in the case of the first six constructs for Peter's grid the poles have been interchanged so that what were the implicit (right) poles in the original grid are represented in the grid above as explicit (left) poles. It proved possible to make what appeared to be sensible interpretations after these changes had been effected. It is appropriate to emphasise again that the objective was not to conduct the current research in a vacuum but to involve participants in the process. This was in keeping with the idiographic philosophy upon which the current research was founded. When the second interview was conducted each of the grids elicited at the first interview was discussed and participants were asked to indicate whether they agreed with the preliminary interpretations made about them. Thus there was an opportunity for participants to validate interpretations or to repudiate them if they wished. Thus, by reading back interpretations of the grids to participants, the danger of a 'semantic trance' which veils and in the extreme can obliterate the contribution of the participant was reduced (Coxon, Davies & Jones 1986, p. 95).

In connection with point (b) it was possible to be misled by indicators such as the construct consensus measure. The first and second occasion grids were always organised to be conformable in terms of the arrangement of the poles of the constructs. The consensus coefficients for the constructs were based on relatedness in terms of the positive (left-hand) poles. Thus a reduction in the construct consensus coefficient between the first and second occasion could occur, not because of a change in the form of a cognitive structure but because a participant was more negative on the second

occasion. Adams-Webber (1979, p. 34) noted that 'people can revise their impressions of their associates (activities) without altering the pattern of the relationships between constructs', that is, 'the logical structure of their conceptual systems'. This potential to be misled was recognised in the current research. Thus before any analysis was undertaken the pattern of ratings in the first and the second occasion grid for each of the three domains investigated was examined to determine if a generalised change in outlook was evident. This did occur in relation to Peter's construing of his work colleagues. Without affecting the integrity of the data the grids which related to the work domain were reconfigured so that a sensible interpretation of them could be made.

### **Classical Multidimensional Analysis of the Grid**

The dissimilarity matrices that were produced by FUZZYGRID were used for two multidimensional scaling analyses. The first was a Classical Multidimensional Scaling analysis (CMDS) the basis of which was elaborated in chapter 6. This was used to uncover the form of the cognitive structure and the element configuration suggested by the first occasion grid. The second, a variant of Weighted Multidimensional Scaling (WMDS) developed by Carroll and Chang (1970) was used to infer whether or not there had been significant change in the form of the cognitive structure during the interval between the first and second interview. This analysis involved both occasion grids. The decision process that led to the choice of WMDS is elaborated following the presentation of the CMDS analysis for Peter's first work-nonwork activities grid.

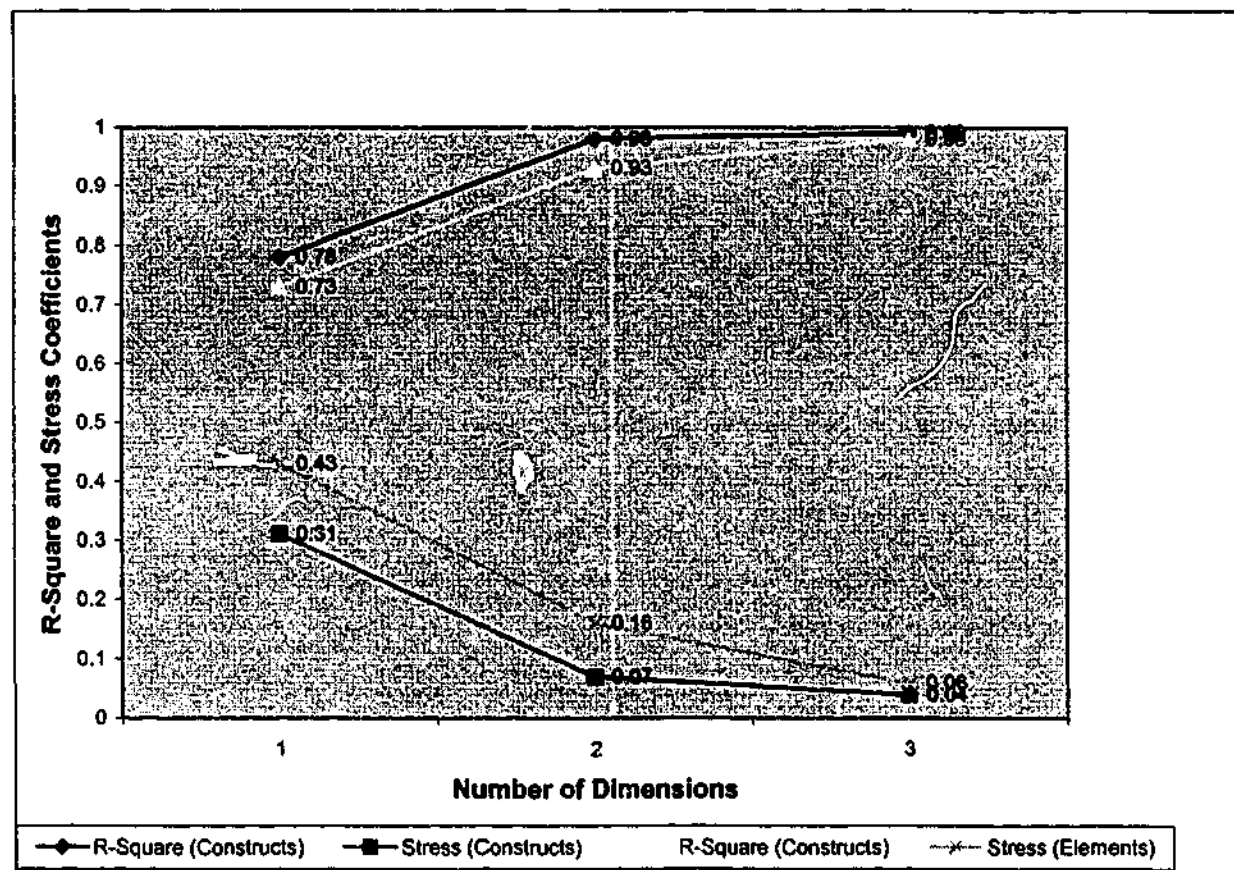
The model statistics for one, two and three dimensional, metric (interval level) CMDS solutions for the first occasion work-nonwork activities grid are shown below.

**Table 7.5: CMDS Model Statistics for Peter's Work-Nonwork Grid**

Number of Dimensions	R-square	Stress
<b>Constructs</b>		
1	0.78	0.31
2	0.98	0.07
3	0.99	0.04
<b>Elements</b>		
1	0.73	0.43
2	0.93	0.16
3	0.98	0.06

### Choosing the Number of Dimensions

The table shows that r-square increased and stress decreased with increasing dimensionality. This pattern is highlighted in the Figure 7.1.



**Figure 7.1: Changes in Stress and R-Square with Dimensionality**

The method used to interpret figures such as this is analogous to that which is used to interpret a *Scree Plot* in factor analysis. That is, the point in such plots at which a discontinuity is observed is indicative of the optimal number of factors that should be used in a solution (Cliff 1987, pp. 313–14). Similarly, in Figure 7.1 it may be seen that

for the constructs and the elements there is an elbow in the curves for the r-square and stress values. Generally the number of dimensions at this elbow are the maximum number which should be considered (Schiffman, Reynolds & Young 1981, p. 11). The marginal increases in r-square and the marginal decreases in stress when a third dimension was added indicated that the two dimensional solution was optimum and parsimonious. The construct map generated for a two dimensional solution is shown below.

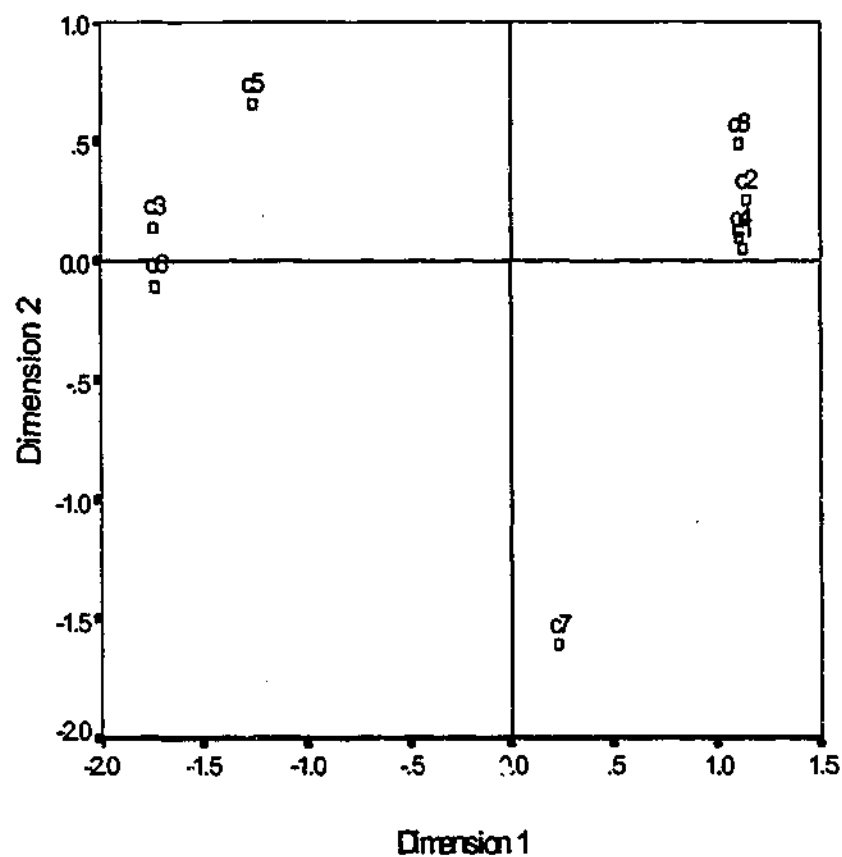


Figure 7.2: Construct Map for Peter's Work-Nonwork Activities Grid

### Interpreting the Construct Map

The construct map shows two clusters of constructs, one in the north-east and another in the north-west quadrant. An isolate is located in the south-east quadrant towards the bottom of the map. An analysis of the clusters and the isolate indicated that they were reflective of the preliminary interpretation that had been made of the grid.

The cluster in the north-east is quite tight and comprises constructs one, two, four and eight. It was interpreted as indicative of a generalised *pleasure – pain* affect that Peter employed to construe activities in the work and nonwork domain. The cluster in the north-west which comprises constructs three, five and six was illustrative of a sense of obligation versus freedom in relation to his responsibilities at work and at home.

In the preliminary interpretation it was argued that the seventh construct *related to home – related to work* was fundamentally different from the others. As may be seen this construct stands in isolation from both of the clusters in the map. This lends support to the earlier view of it as primarily a means of discriminating between activities in terms of the domain in which they were carried out.

### **The Element Map**

It was shown in Gareth's case that an analysis of his work-nonwork activities grid was enhanced by an examination of the element configuration. The element map for Peter's grid is shown below.

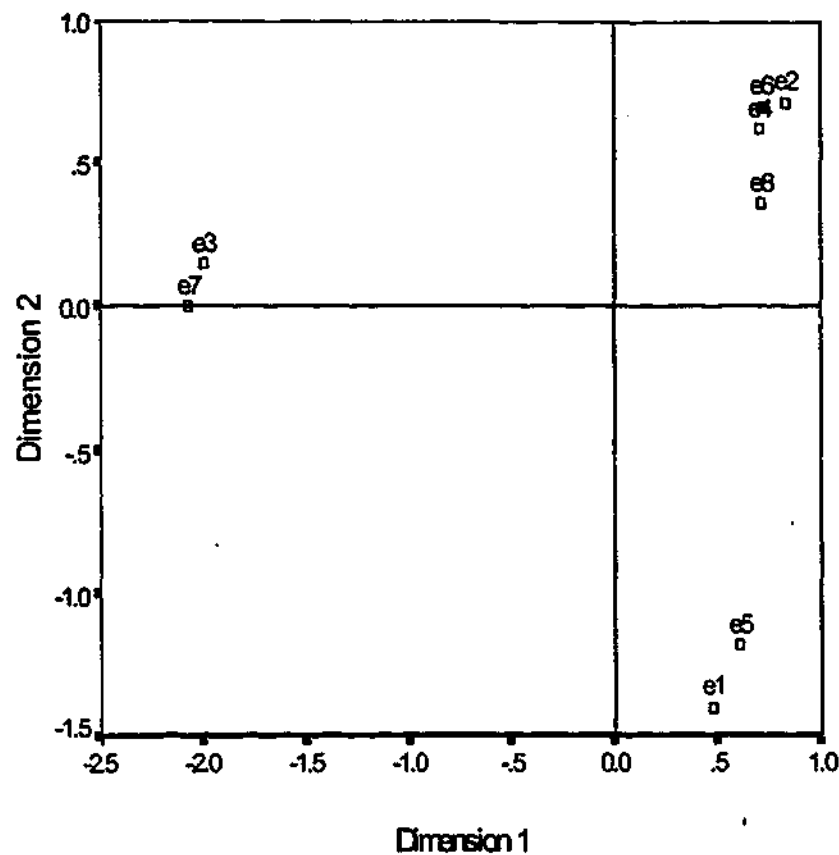


Figure 7.3: Element Map for Peter's Work-Nonwork Activities Grid

### Interpreting the Element Map

The configuration of elements in the map above was sensible. It may be seen that the map comprises one cluster towards the north-east corner of the map and two dyads, one in the north-west quadrant and one located towards the south-east corner. Looking firstly at the cluster; the triad of elements clustered close together which are (e2) *quality time with my wife*, (e6) *cutting grass and organising the yard* and (e4) *washing dishes* are all nonwork activities. Close by is another activity (e8) *working on the computer*, which although dominated as a nonwork activity was construed by Peter as spanning both domains. This was indicated in the grid by the rating of 0.5 for this activity on construct seven *related to work – related to home*. Element three, *wasting time* and (e7) *stripping out sheets* were each activities that were negatively construed by Peter. Thus their location proximate to one another made sense.



Element one *fork-lift driving* and (e5) *operate and run machines* were distinctive as work related activities.

### **Assessing the Analytical Results**

The indications were that for this grid the results generated by FUZZYGRID and augmented by the CMDS analysis uncovered a cognitive structure that was neither overly simple nor complex in form. The consensus coefficients for the constructs were in keeping with the magnitude of the Golden Section Ratios and reflected the pattern of allocation of elements to the "positive" poles. The element map was not contradictory to the interpretation that had been made of the form of the cognitive structure underlying the constructs.

The form of cognitive structure underlying this grid was a contrast to that inferred from Gareth's work-nonwork activities grid. The construct consensus coefficients which were 0.80 for Gareth's grid and 0.48 for Peter were indicative of cognitive structures whose form was judged to be simple in Gareth's case and neither simple nor complex but nevertheless structured in Peter's case. However in terms of the capacity for discrimination and subtlety Gareth was clearly stronger than Peter. Thus the results for his grid pointed to a *constriction* (Dalton & Dunnett 1990, p. 36) which had occurred in his construct subsystem such that he was more black and white about his likes dislikes and less flexible than Peter.

### **Measuring Change in the Form of Cognitive Structures**

The ability to produce scaling models with good model statistics was encouraging. It suggested that a seamless analysis could be achieved by exporting the results from FUZZYGRID to SPSS for CMDS. However despite this progress two issues required resolution. The first was how to use the first and second occasion grid data to monitor the consistency or otherwise in the form of cognitive structures over time. The second was the ability of the analytical methods developed to produce good results across a number of cases. The approach taken to resolve the first problem is discussed below. The other cases reported in this thesis will demonstrate that the composite of methods ultimately used to analyse the research data were sound.

### **Consistency of Form in Cognitive Structures**

Kelly (1955) questioned the widely held belief that the cardinal value of a psychological test was its reliability or stability over time. The singular interpretation of the *test-retest* reliability coefficient resulted in a blind spot with respect to the significance of change in construct systems. He substituted the term *consistency* for *reliability* to escape from too literal a view of test stability. The term accommodates change processes and clinical manifestations in which the only consistency is consistent inconsistency (Landfield & Epting, 1987, pp. 91-4).

Bannister (1960) reported the development of a measure to assess the consistency in a construct system. The basis of the measure was to generate matching coefficients for each pair of constructs in two corresponding grids and correlate them. Significant positive correlations were taken to indicate a *stable* structure.

When related to his measure of *intensity* (a measure of form) it was possible to differentiate cognitively simple (high intensity scores) but stable individuals from those who appeared to be complex (low intensity scores) but were unstable. This was indicated when their scores on Bannister's consistency measure were low (Bannister & Mair 1968, p. 71).

Bannister (1960) argued against equating his consistency measure with the test retest reliability coefficient, because there was virtually no time interval between the administration of grids upon which the measure was based. He argued that the measure assessed something that might be termed stability or even rigidity in conceptualisation. However, there appeared to be no reason why it could not be used as a measure of test retest reliability. If identical grids were administered at two points in time, construct matching scores could be computed and correlated to yield a test retest reliability coefficient.

The outcomes of the current research have parallels with the work of Bannister (1960, 1962). The measure of construct consensus  $K_G^c$  is similar to his intensity measure. A consistency measure for two grids could be derived, by correlating the corresponding upper diagonal elements in the construct similarity matrices generated for each occasion grid. This would have been similar to Bannister's (1960) approach since the coefficients in the similarity matrices are a type of matching score. As shown in (4.11) they indicate the overall level of agreement between construct pairs in a single grid. However, the correlation approach was rejected primarily because it did not fit well with the direction the analysis had taken which was to use CMDS as an adjunct to FUZZYGRID. Moreover, a correlation measure could not be readily related to the

separate construct maps that could be produced by CMDS for two occasion data. Furthermore, it was deduced that there was also the potential for bias in a correlation coefficient due to offsetting effects that could occur between the dissimilarity coefficients in each of the dissimilarity matrices. Therefore, it seemed preferable and logical to research the possibility of somehow building on the results already generated through MDS to measure change or stability in the form of a cognitive structure. It was hoped that such a measure could be used not only to cross validate the consensus coefficients, but also related to some kind of graphical MDS output. Thus, a decision was made to move the research in this direction.

### **Evaluating Multidimensional Scaling Options**

Three multidimensional scaling methods were evaluated. Each method is discussed below.

*Option 1: Repeat a CMDS for each Dissimilarity Matrix.* This would involve running a separate CMDS on single dissimilarity matrices, one for the first occasion and another for the second occasion data. The solutions could be compared in terms of the goodness of fit and stress. Models with different numbers of dimensions could be run to investigate whether the dimensionality had altered over time. For example a two dimensional solution for a first occasion grid might prove inadequate for a second occasion grid. A solution in three dimensions or in a single dimension might yield better results. However, in the same way as it is difficult to judge the amount of 'sameness' and 'difference' between separate factor analyses of two grids (Bannister & Mair 1968, p. 158), it is difficult to compare two separate CMDS analyses. Moreover, the repeated application of CMDS to separate matrices implies that the matrices have no shared

structure. It seemed unreasonable to assume that cognitive structures would change to such a degree as to appear to be independent of each other from one period to the next. However, it was acknowledged that this could occur. Constructs can move from tight to loose and back again (Dalton & Dunnett 1990, p. 33) or in the reverse direction. Therefore, an objective was to locate a scaling technique that would cater for cognitive structures that shared common features over time and for those that were markedly or perhaps totally different.

In summary, the option of running separate CMDs analyses proved too cumbersome in terms of comparing first and second occasion data. No measures emanating from the simultaneous analysis of both dissimilarity matrices were available. However, as will be shown, scaling maps emanating from a CMDs solution of a first occasion grid were ultimately used to cross check the results emanating from the chosen method of analysis.

*Option 2: Repeated Multidimensional Scaling (RMDS).* The search for an appropriate technique moved to a consideration of RMDS as an option. RMDS (McGee, 1968) is a scaling technique in which two or more similarity or dissimilarity matrices can be analysed simultaneously. The assumption underlying the technique is that a derived stimulus configuration applies with equal validity to every data matrix under consideration. The implication is that all of the dissimilarity matrices are replicates of each other. There are no systematic differences other than perhaps differences in response error (Young & Harris 1994, p. 176). Thus whilst RMDS permits the simultaneous analysis of two or more matrices, the assumption underlying it and the implication which follows from that, rendered it unsuitable for the current research.

Therefore it was also rejected as an approach to assessing change or stability in the form of cognitive structures.

*Option 3: Weighted Multidimensional Scaling (WMDS).* The usual context for the application of this technique is the assessment of similarities and differences between a group of individuals say in relation to how they evaluate a product. Thus the defining feature of the technique is its capacity to account for similarities and differences in the 'perceptual or cognitive processes that generate responses' (Young & Harris 1994, p. 120).

Solutions produced by WMDS include a *group space* and a *subject space*. The group space is a configuration of  $p$  stimulus points in a user-chosen number of dimensions  $r$ . It acts as the reference configuration and can be interpreted as representing the information that is shared in common across subjects about the stimuli. The group space is Euclidean such that points in each space which are close to each other represent stimuli which are perceived as similar to one another (Coxon 1982, p. 191). In relation to repertory grid data, a group space could be interpreted as the commonality in the structure of the constructs or elements in two or more grids depending on which is under consideration.

The subject space is different. It contains *vectors*, one for each subject (data matrix, usually a dissimilarity matrix). It is the angular separation between vectors, which forms the basis for the identification of individual differences in perceptual or cognitive processes. Vectors that point in *exactly* the same direction indicate subjects whose relative weighting of the dimensions is the same.

The length of the vectors (the r-square value found by summing the squares of the individual weights) indicates the goodness of fit for the individual data matrices. Two vectors can point in the same direction but be of different lengths (Young & Harris 1994, p. 190). Thus, when applied to the constructs or elements for two or more repertory grids, the orientation of vectors could indicate changes in the configuration over time or differences between grids at the same point in time. In either case a requirement is that each grid is identical in terms of the elements and constructs under consideration. This is a general requirement in WMDS; the stimulus space must be common across subjects (Schiffman, Reynolds & Young 1981, p. 300).

The indications were that WMDS could be adapted for use with repertory grid data. The dissimilarity matrices generated from the first and second occasion grid data could be treated as *quasi subjects*. WMDS could then be applied to the matrices to generate a group space that would reflect the commonality in the grid data over time. The subject space could be used to indicate the change if any in the form of cognitive structures or element configurations over time. However, it was suspected that WMDS results could be spoiled through the pooling of dissimilarity matrices to obtain a group space. Coxon (1982, p. 193) alluded to this outcome as indicated by the following:

The INDSCAL\* group stimulus space configuration should therefore be interpreted with caution: strictly speaking it represents a subject who weights the dimensions equally, and if a significant number of subjects' weights depart markedly from equality then there is a danger of interpreting a configuration which is in no sense representative.

\* The acronym derives from experiments in which subjects make pair-comparison of the similarity between stimuli INDividual Differences SCALing (Coxon, 1982, p.189).

Thus, doubt was cast on the quality of results that could be achieved by using the first and second occasion matrices to produce a WMDS analysis. There would be no way of confidently identifying stability or change over time because of the blending of data to

produce the group stimulus space from which individual subject spaces are derived. This problem applies not only to longitudinal data but also to cross-sectional data used for WMDS.

### **Returning to Peter's Work-Nonwork Activities Grids**

At first it was inferred that the underlying form in the cognitive structure relating to work and nonwork activities was stable, an impression gained from the minimal variation in the construct consensus estimates. However, the difficulty that remained was to generate independent measures for each occasion matrix that could be relied on to actually measure stability or change over time. Because of the way that WMDS generates the group space, an analysis based on the combination of the first and second occasion matrices would be deficient. It would produce results that indicated not the relationship of the first and second occasion matrices to each other, but to a kind of aggregate configuration resolved from the two matrices.

Jacoby (1998) wrote that in connection with WMDS 'the non-independence of vectors has always been a concern' (Jacoby, G. J. 1998, pers. comm January 8). This was a further indication that the utility of WMDS was diminished because of the non-independence of data matrices. It appeared that the efficacy of the longitudinal design would be weakened by this limitation of WMDS. Consequently the standard WMDS method was deemed unsuitable for the purpose of the current study. However, further research indicated that there was a solution to the problem. Data manipulations could be undertaken and the ALSCAL routine in SPSS could be modified to alleviate the problem associated with the non-independence of data matrices. How this was achieved is discussed below.



## Modifying the ALSCAL Routine in SPSS

It was resolved that using the syntax available in SPSS, new command files could be written to achieve two objectives:

- (a) Derive a configuration from the first occasion construct dissimilarity matrix that could be used as a reference configuration using the INDSCAL model in the ALSCAL routine.

When the INDSCAL model is used it requires more than one dissimilarity matrix (subject/grid). This was a problem in the current research because only one grid was available for analysis for each occasion. However, it was deduced that this problem might be solved, by *cloning* dissimilarity matrices to produce a quasi group. In theory the non-independence of vectors would not be an issue since INDSCAL would be blending identical matrices to produce a group space.

The dissimilarity matrix generated by FUZZYGRID for the constructs in Peter's first occasion work and nonwork activities grid was *replicated* to produce a quasi group of cloned subjects. Replicates not duplicates were necessary to obviate problems encountered by the ALSCAL algorithm in trying to invert a matrix derived in the process of analysis. Sometimes this matrix proved to be *singular*. Such matrices have a determinant of zero and therefore have no inverse (Hohn 1964, p. 93). The number of replicates varied from case to case. These replicated matrices were stored as an SPSS data file that was then used to produce a reference configuration using the INDSCAL model.

The modified SPSS command file written to produce the reference configuration is shown below.

```
ALSCAL  
VARIABLES= c1 c2 c3 c4 c5 c6 c7 c8  
/SHAPE=SYMMETRIC  
/LEVEL=INTERVAL  
/CONDITION=MATRIX  
/MODEL=INDSCAL  
/CRITERIA=CONVERGE(.001) STRESSMIN(.005) ITER(100)  
CUTOFF(0) DIMENS(2,2)  
/PLOT=DEFAULT ALL  
/PRINT=DATA HEADER  
/outfile = 'REFCON. sav'.
```

Figure 7.4: ALSCAL Syntax for Deriving a Reference Configuration

The subcommands highlighted show that the model specified when running WMDS is not **EUCLID**, which is the default for CMDS, but **INDSCAL**. The last subcommand is that which saves the output from the program to a standard SPSS data file.

Analysis was conducted to determine if the logic underlying the cloning of matrices would produce sound results. That analysis yielded r-square and stress coefficients, individual subject (grid weights) and a *weirdness* index. The weirdness index which ranges on [0,1], indicates how typical a subject is in terms of the "group" under consideration. When the index has a value of zero for a particular subject (grid) then that subject (grid) is regarded as typical of the group as a whole. In terms of subject weights the weight ratio for that subject would be the same as the ratio of the mean weights for the group. If a subject (grid) records a weirdness index value of 1.0 then that subject is regarded as *weird* or atypical (Young & Harris 1994, p. 207).

What was expected was that since the first occasion matrix was replicated to create cloned subjects (grids) the weirdness index for each cloned matrix would be zero. Similarly it was expected that the r-square, stress and weights for each cloned matrix

would be identical. It was also expected that the r-square and stress coefficients would be identical to that produced by the analysis of a single dissimilarity matrix using CMDS.

The results of these analyses are presented in Table 7.6.

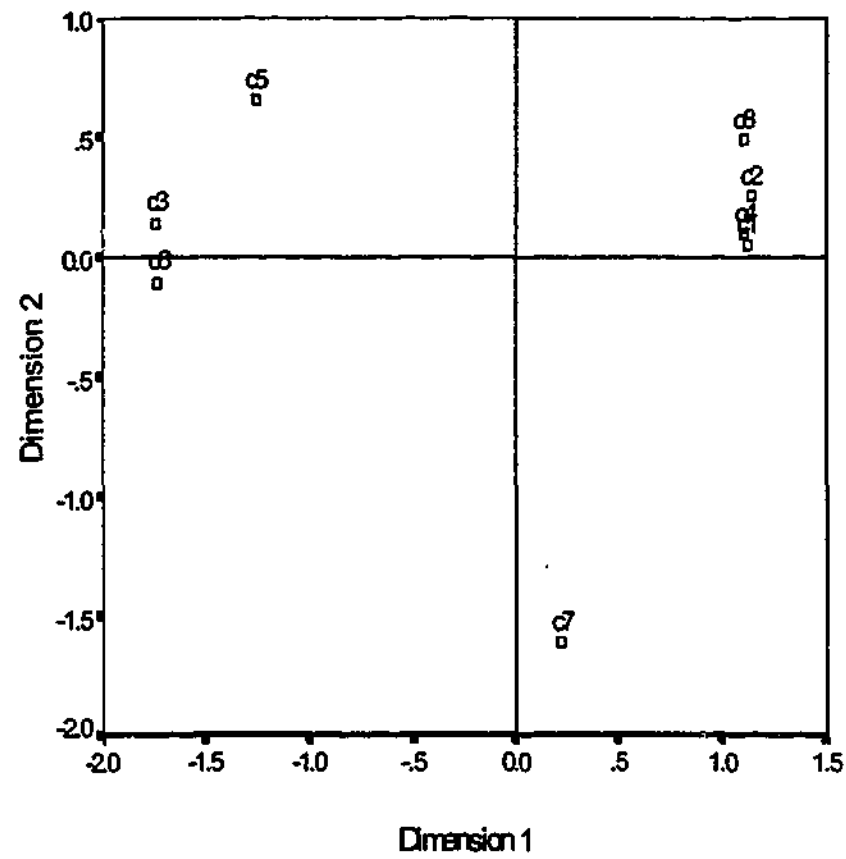
**Table 7.6: CMDS and WMDS Results for Peter's First Occasion Grid**

Grids <sup>(a)</sup>	R-square	Stress	Weight 1	Weight 2	Weirdness
CMDS					
Matrix 1	0.98	0.07			
WMDS					
Matrix 1 cloned	0.98	0.07	0.96	0.25	0.00

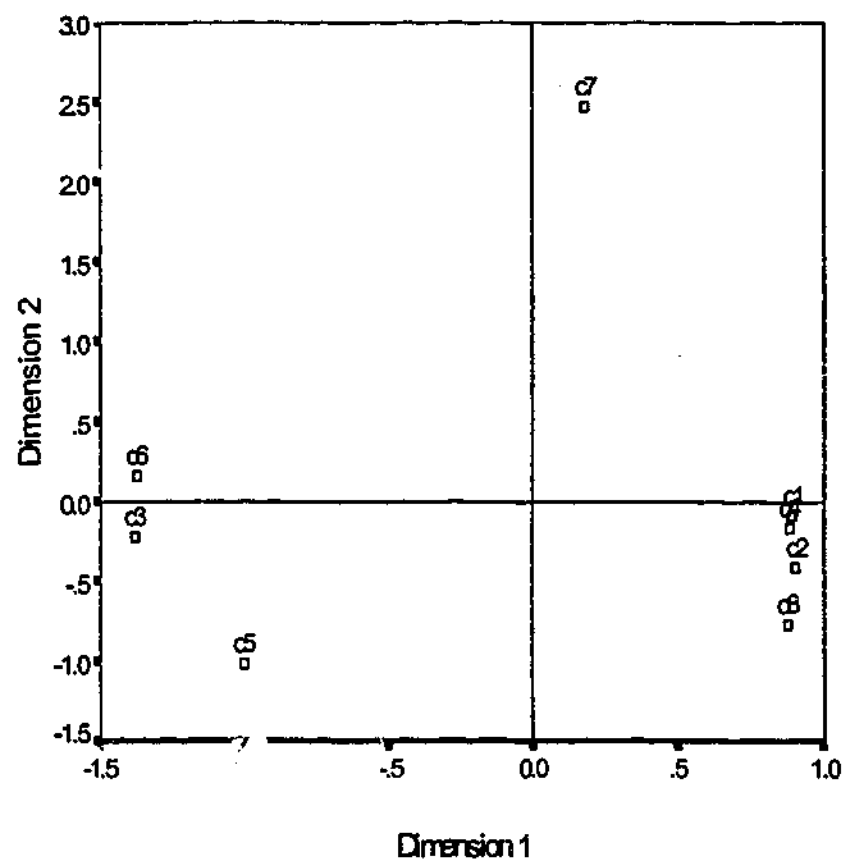
(a) The results pertain only to the constructs. Weights and Weirdness indices are not generated under CMDS.

These results were in keeping with expectations. It may be seen that the r-square and stress coefficients are identical under the CMDS analysis for Matrix 1 and for the WMDS analysis of Matrix 1 after it was cloned. For the cloned matrix the weirdness index value was 0.00 as expected. The r-square, stress and the weights for the single matrix and the clones were identical.

The first occasion construct map produced using CMDS and those produced from the clones of Matrix 1 are shown below in that order.



CMDS Analysis of First Occasion Grid



WMDS Analysis of Cloned First Occasion Grid

Figure 7.5: Construct Maps for Peter's First Occasion Work-Nonwork Activities Grid

In keeping with the analytical results reported above, the first and second maps are identical in terms of the position of the constructs relative to one another. The inverse positioning is a quirk of the SPSS software. It was expected that these maps would be identical as the second represents the cloned matrices for the first occasion data.

(b) The second objective was to use the configuration **REFCON** as a fixed configuration and to then derive subject weights for the second occasion grid that could be compared with those generated for the fixed configuration. This logic was an expression of an aside by Coxon (1982, p. 194) which indicated that INDSCAL could be used in external mode if the user provides the program with a configuration that remains fixed in orientation. INDSCAL then concentrates entirely on estimating from the current data subject weights for that configuration. Coxon argued that such an approach was suitable for replication studies. The design of the current research incorporated a replication study since participants rated the same grids on two occasions. Thus it seemed feasible to employ the method advocated by Coxon. The syntax used to implement the variation in INDSCAL is shown below.

```
ALSCAL  
VARIABLES= c1 c2 c3 c4 c5 c6 c7 c8  
/ file = 'REFCON.sav' CONFIG(FIXED) SUB(INITIAL)  
/SHAPE=SYMMETRIC  
/LEVEL=INTERVAL  
/CONDITION=MATRIX  
/MODEL=INDSCAL  
/CRITERIA=CONVERGE(.001) STRESSMIN(.005) ITER(100)  
CUTOFF(0) DIMENS(2,2)  
/PLOT=DEFAULT ALL  
/PRINT=DATA HEADER .
```

Figure 7.6: Syntax for Deriving a Configuration for Second Occasion Data

The first subcommand highlighted shows that this program reads the file **REFCON.sav**, which contains the configuration generated from the first occasion data.

The configuration is fixed **CON(FIXED)** and the subject weights are set to their initial values **SUB(INITIAL)** which are those estimated for the reference configuration. The INDSCAL model is then run using the data file containing cloned second occasion construct dissimilarity matrices. It may be seen that there is no explicit syntax referring to this data file since when running SPSS for windows such files are opened as a window.

Together the two programs shown above comprised a variation to WMDS such that the second occasion data could be compared to a reference configuration. From this point on the term **FIXED-POINT WMDS (FPWMDS)** will be used to distinguish this variation of the WMDS method derived for the current research.

The second program was tested by running the first program on the cloned matrices for Peter's first occasion grid to produce a reference configuration. These same matrices were then used again as input for the second program that first read the reference configuration and fixed it. In theory the r-square stress and subject weights should have been identical to those generated when the first program was run since exactly the same data were used. This is what eventuated. Subsequently FPWMDS was trialled on Peter's first and second occasion work and nonwork activities grids. The results of that trial are presented and evaluated below.

#### **Testing FPWMDS on Peter's Work-Nonwork Activities Grids**

Solutions in one dimension are not permitted under FPWMDS. However, this is a general feature of WMDS methods and not peculiar to the FPWMDS method derived for

the current research. The FPWMDS solution shown in the Table 7.7 below is two-dimensional.

**Table 7.7: FPWMDS Model Statistics for Peter's Work-Nonwork Grids**

Grids	R-square	Stress	Weight 1	Weight 2
Reference Configuration	0.98	0.07	0.96	0.25
Second Occasion Configuration	0.39	0.37	0.56	0.29

These results were used to derive indicants of the differences between the configurations. These are shown in Table 7.8.

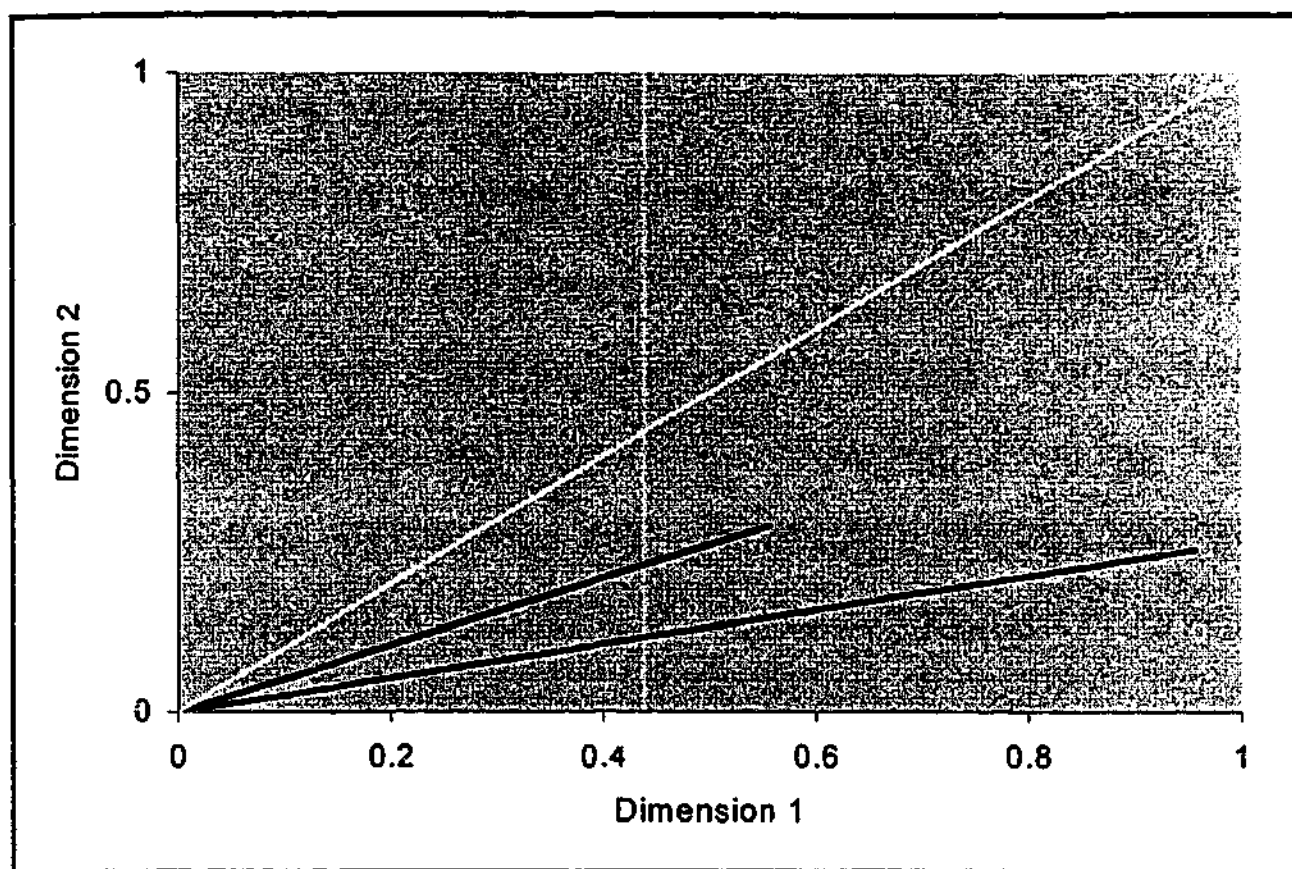
**Table 7.8: Differences Between Weights for the FPWMDS Configuration**

Grids	Weight 1	Weight 2	Weight Ratio	Angle <sup>(a)</sup>	Deflection <sup>(b)</sup>
Grid 1	0.96	0.25	0.27	14.84°	-0.58
Grid 2	0.56	0.29	0.52	27.57°	-0.31

(a) The tangent of the angle that the subject (grid) vector makes with the first dimension ( $\tan \theta_1$ ) is defined as the ratio of the weight on dimension 2 to the weight on dimension 1.

(b)  $\tan (\theta_1 - 45^\circ)$  measures this predominance of dimension 2 over dimension 1 as a deflection (angular departure) from the line of equal weighting (Coxon 1982, p. 196). For solutions in two dimensions an easy method of assessing the relative salience of the dimensions is to take the ratio of the weights and then perform a logarithmic transformation on the weight ratios. The reason for the transformation is to compensate for the positive skew in the distribution of such ratios (Coxon 1982, p. 195). The log values (natural logarithms) for the weight ratios in the above table are -1.31 and -0.65 for ratios 1 and 2 respectively.

The *deflection* coefficient is such that when it is zero each dimension is equally salient. When it is positive dimension two is more salient than dimension one, and when it is negative dimension one is more salient than dimension two. This can be depicted in a weight space as shown below.

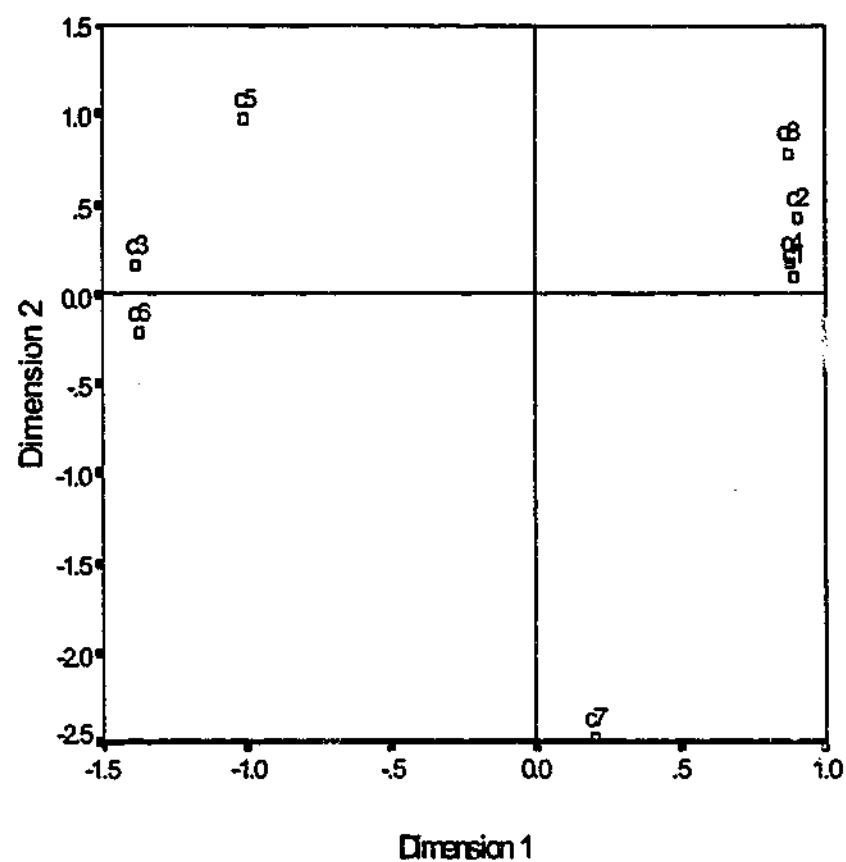


**Figure 7.7: FPWMDS Weight Space for Peter's Work-Nonwork Activities Grids**

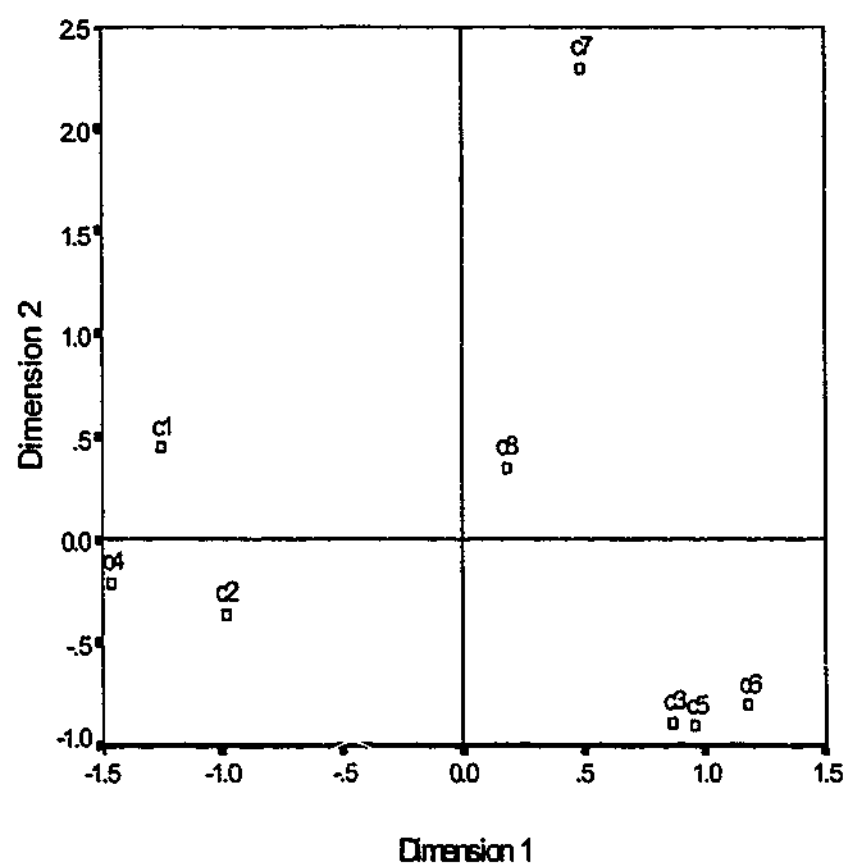
The line which is uppermost in the chart is the 'line of equal weighting' (Coxon 1982, p. 199). Vectors that lie along this line represent structures in which each weight is equally salient. Vectors that lie above it are indicative of structures in which dimension two is more heavily weighted than dimension one and vice versa. In relation to Peter's grids it may be seen that the location of the two vectors below the 45-degree line shows higher salience of dimension one for both occasion data. The line closest to the horizontal represents the first occasion grid. This line is longer than the one above it as the r-square for the first occasion grid was higher. Thus, the weight space depicts differences in perception or cognition by differences in the orientation and length of vectors. Variation in orientation is the most important as it reflects difference in the salience of dimensions. Differences in length simply indicate that one grid is better described by the analysis than another (Young & Harris 1994, p. 190). That is, longer vectors represent higher r-square coefficients.



Two construct maps are shown in Figure 7.8. The first is the map for the reference configuration produced from the cloned matrices for the first occasion data (PROGRAM 1). This map is the same as that shown in Figure 7.2. The second is a construct map produced by using cloned matrices for the second occasion data in an INDSCAL model but without relating that data to the reference configuration. Differences if any in the underlying form of the cognitive structures indicated by the differing subject weights for the first and second occasion data should be reflected by differences in the maps.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.8: Construct Maps for Work-Nonwork Activities Grid

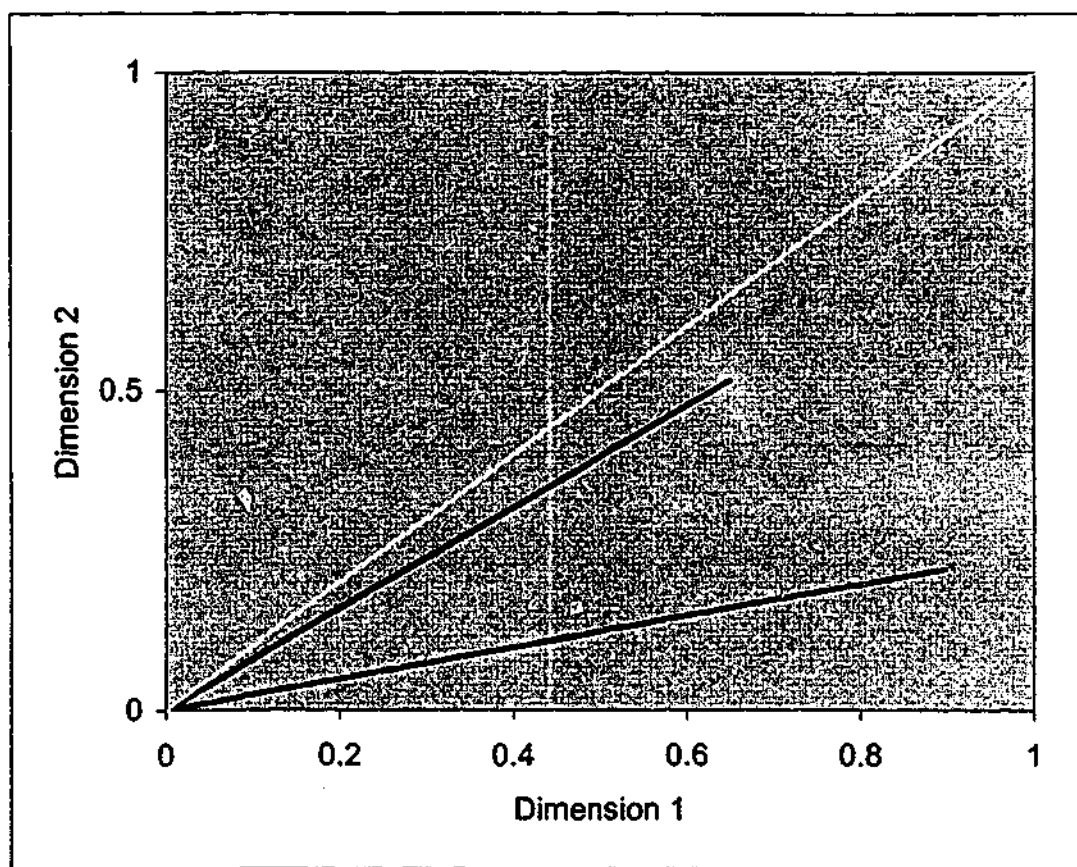
In the second map the cluster in the south-west (north-east in the first map) is looser and that in the south-east (north-west in the first map) is tighter. Relative to the clusters the isolate construct seven is located in almost the identical position in both maps. However it may also be seen that the positioning of the constructs in relationship to one another is quite similar in the second map in comparison to the first. Thus, the underlying form of the structure in terms of the relationship of the constructs to one another, appeared to have been maintained between the first and second interview.

The results for an analysis of the same grids under a standard WMDS analysis where the first and second occasion data were combined are shown below.

**Table 7.9: Model Statistics – Standard WMDS of Peter's Work-Nonwork Grids**

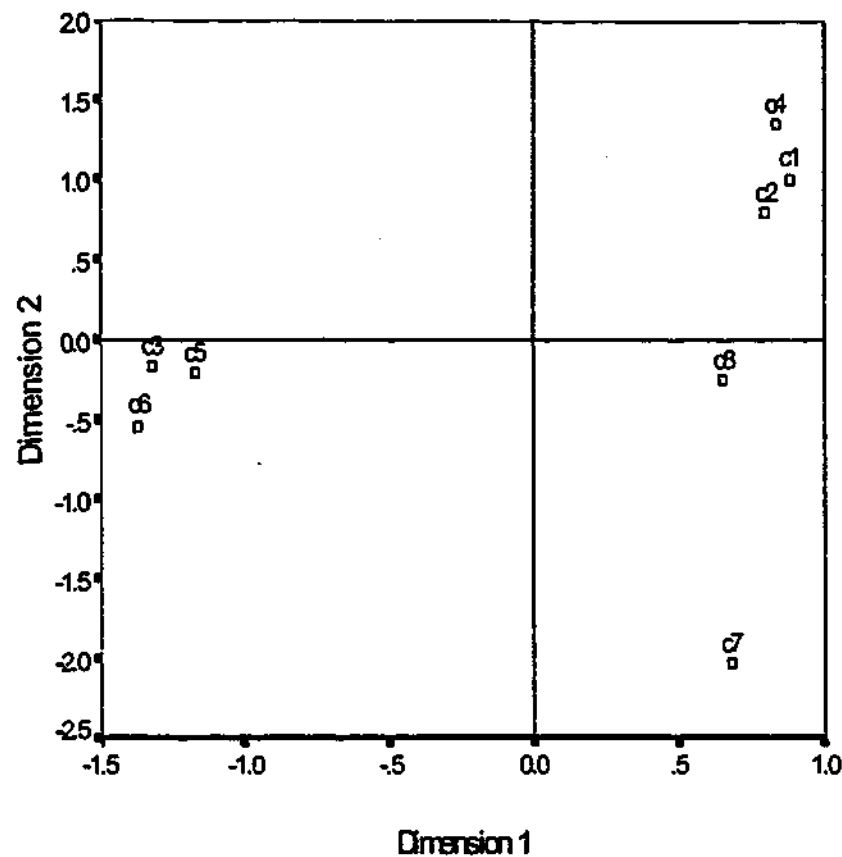
Grids	Weight 1	Weight 2	Weight Ratio	Angle	Deflection
Grid 1	0.89	0.22	0.24	13.73°	-0.61
Grid 2	0.65	0.52	0.79	38.43°	-0.12

In this solution the weight ratio for the second grid is markedly different to that generated under the FPWMDS method. This difference is reflected in weight space shown below.



**Figure 7.9: WMDS Weight Space for Peter's Work-Nonwork Grid**

The vectors in this weight space again show the dominance of the first dimension. However the significant difference in the direction of the vectors shown implied that the form of the cognitive structure underlying each of the grids was different. This was at variance with the essential similarity in the form of the cognitive structure that was indicated by the FPWMDS analysis and shown in Figures 7.7 and 7.8. Thus concerns about using WMDS were affirmed. The construct map for the WMDS analysis is shown below.



**Figure 7.10: Construct Map for Peter's Work-Nonwork Grids under WMDS**

It may be seen that this map reflects the blending that occurs when standard WMDS analysis is used for either cross-sectional or longitudinal data. In relation to the data under consideration the differences between this map and that for the second occasion grid in Figure 7.8 are not marked. However, for grids where there was less stability in the ratings it was expected that the differences would be substantial. The rationale behind this conclusion was the difference in the method underlying WMDS and FPWMDS. Whilst both methods use the INDSCAL model, the revised method is distinguished by the separate derivation of a reference configuration for the first occasion data, against which the second occasion data are evaluated. Moreover, the blending problem that arises through the application of the INDSCAL model was negated by using cloned matrices for the first and the second occasion data.

In summary, the strongest indications emanating from the analysis of the grid data over two occasions were that the cognitive structure could be rationalised, that its form was neither overly simple nor complex, and that it was stable over time. The FPWMDS analysis supported the latter inference. The argument that standard WMDS would be unsuitable for the analysis of cognitive structures was supported by differences between the results presented for the standard WMDS and the FPWMDS analysis of the data. Thus, a decision was made to implement FPWMDS as the final analytical component in the methodology.

The FPWMDS method was enhanced by deriving an index bounded on [0,1] that could be used as a benchmark indicator of stability or change in cognitive structures. The theory and method used to achieve this is described and discussed below. It capitalised on the vector geometry that had already been used to show weight vectors derived from FPWMDS.

### **Using Directional Statistics to Compare Subject Vectors**

An index which indicates the angular difference between subject (grid) vectors can be derived by using *directional statistics* which are ideally suited to the interpretation of subject spaces (Schiffman, Reynolds & Young 1981, p. 299). A particular advantage of the index is that it can be created for FPWMDS solutions in more than two dimensions. The equations presented by Schiffman, Reynolds and Young (1981, pp. 301–4) used to do this are shown below. As the name suggests, when using directional statistics the primary interest is the direction of the subject vectors not their length. Therefore, in order to concentrate on the direction of the vectors, the first step is to normalise the subject weights.

$$L_k = \left( \sum_{a=1}^r W_{k,a}^2 \right)^{1/2} \quad (7.1)$$

$L_k$  is the length of a subject's (grid's) weight vector where  $k = 1, 2, \dots, m$  the number of subjects (grids), and  $a = 1, 2, \dots, r$  the number of dimensions.

$$W_{k,a}^* = W_{k,a} / L_k, \quad W_{k,a}^* \text{ are the normalised weights.} \quad (7.2)$$

The normalised weights are such that

$$\left( \sum_{a=1}^r W_{k,a}^{*2} \right)^{1/2} = 1 \quad (7.3)$$

The *mean direction* for a set of vectors can found as follows:

$$W_a = \frac{1}{m} \sum_{k=1}^m W_{k,a}^* \quad (7.4)$$

A related statistic the *mean resultant length*  $\bar{R}$  is calculated according to the following formula:

$$\bar{R} = \left( \sum_{a=1}^r W_a^2 \right)^{1/2} \quad (7.5)$$

An index  $\bar{S}$  can be derived from  $\bar{R}$  such that :

$$\bar{S} = 1 - \bar{R} \quad (7.6)$$

When the mean direction is 1 all of the subject weight vectors point in the same direction, that is they have equal normalised weights. Thus, there is no variation and  $\bar{S} = 0$ . In WMDS the subject weights are restricted to being positive. This means that the maximum value for  $\bar{S}$  is not 1. Its maximum value is dependent on the

dimensionality of the solution. However, a transformation can be performed such that the resulting index is bounded on [0,1]. The transformation is shown below.

$$S^* = \frac{\bar{S}}{1 - (1/r)^{1/2}} \quad (7.7)$$

Equations (7.1) to (7.7) provide the basis for deriving an index of change in the configuration of repertory grid data, which is  $S^*$ . This index is independent of the number of dimensions in an FPMDS solution. It will be referred to as the *index of angular variation*. It is a more comprehensive measure than simple *test-retest* coefficients based on correlation statistics, since the underlying structure is explicitly recognised in the process of arriving at it. That is, subject (grid) vectors, which are an expression of structure, are the foundation upon which the measure is constructed.

The weights, normalised weights and lengths for Peter's work-nonwork activities grids are shown below.

Table 7.10: Weight Vectors and Lengths for the Constructs in Peter's Grids

	Weight 1 $W_{k,1}$	Weight 2 $W_{k,2}$	Length $L_k$	Weight 1 Normalised $W_{k,1}^*$	Weight 2 Normalised $W_{k,2}^*$	Normalised Length $\left( \sum_{a=1}^r W_{k,a}^{*2} \right)^{1/2}$
Grid 1	0.96	0.25	0.99	0.97	0.26	1.00
Grid 2	0.56	0.25	0.63	0.89	0.46	1.00

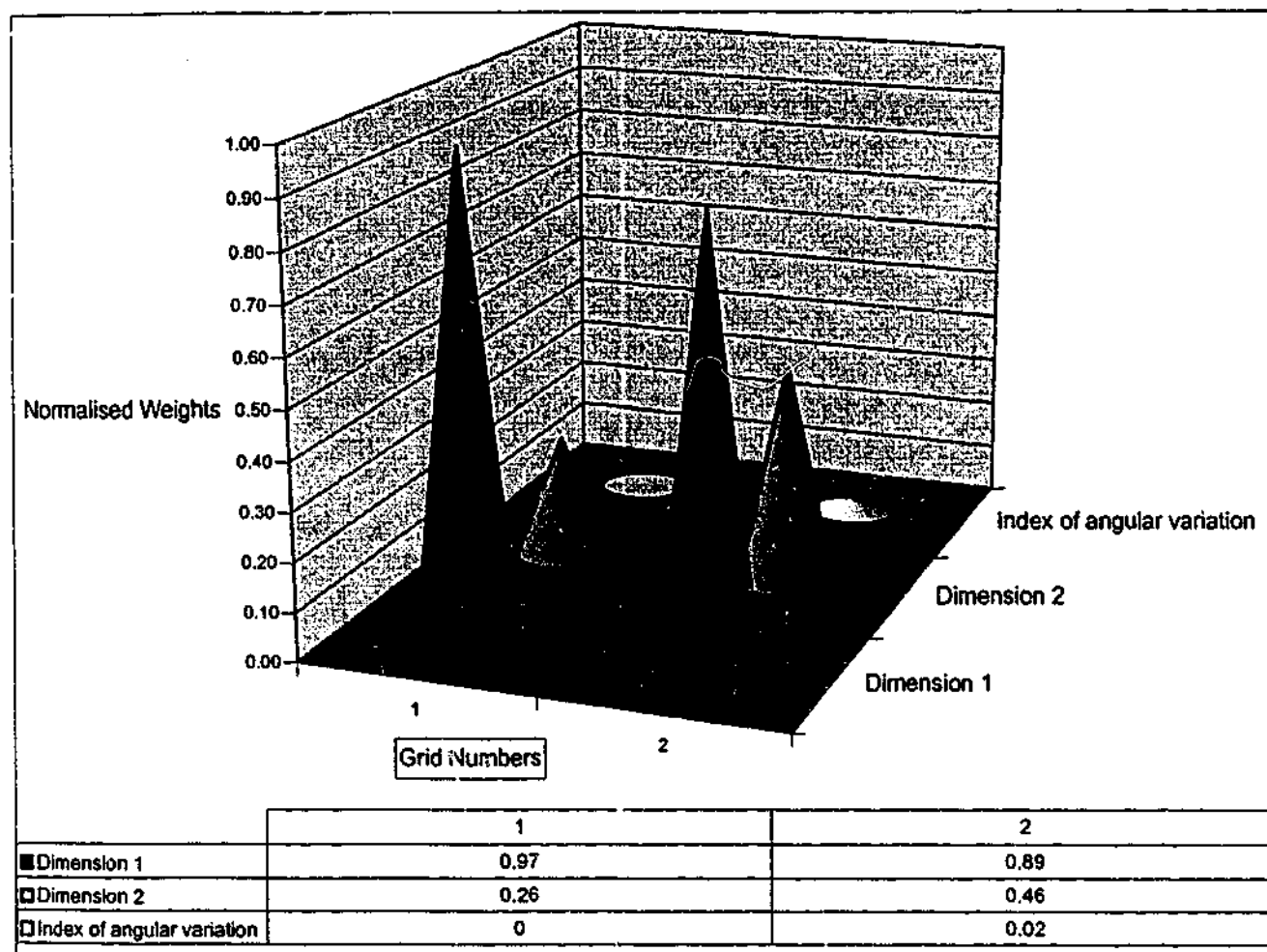
The mean direction for the subject vectors (grid 1 and grid 2), the mean resultant length and angular variation indices are shown below.



**Table 7.11: Vector Directions, Lengths and Angular Variation for the Constructs**

$W_1$	$W_2$	$\bar{R}$	$\bar{S}$	$S^*$
0.93	0.36	0.99	0.01	0.02

The graphic below shows the normalised dimension weights and the index of angular variation for the constructs in Peter's work-nonwork activities grids.



**Figure 7.11: Normalised Weights and Angular Variation for the Constructs**

The graph depicts the variation in the dimension weights and the index of angular variation. Since the configuration for the first grid was used as a benchmark, the index of angular variation was set to zero for all first occasion grids. When reference is made

to the index of angular variation it is to the measured change in the construct configuration between the first and second occasion.

The index of angular variation  $S^*$  whose value is 0.02 indicates that there was minimal change in the form of the structure underlying Peter's work and nonwork constructs between the first and the second interview. For the normal WMDS analysis the value of this index was 0.08. Thus had the normal WMDS method been used, the measured change in the cognitive structure would have been greater. Whilst in this instance the magnitude of the difference was not large, theory mandated that the modified method of WMDS be adopted.

### Comparing Element Configurations

The method that had been developed for comparing dissimilarity matrices for the constructs was also used for the elements. The ultimate results of that analysis are shown below.

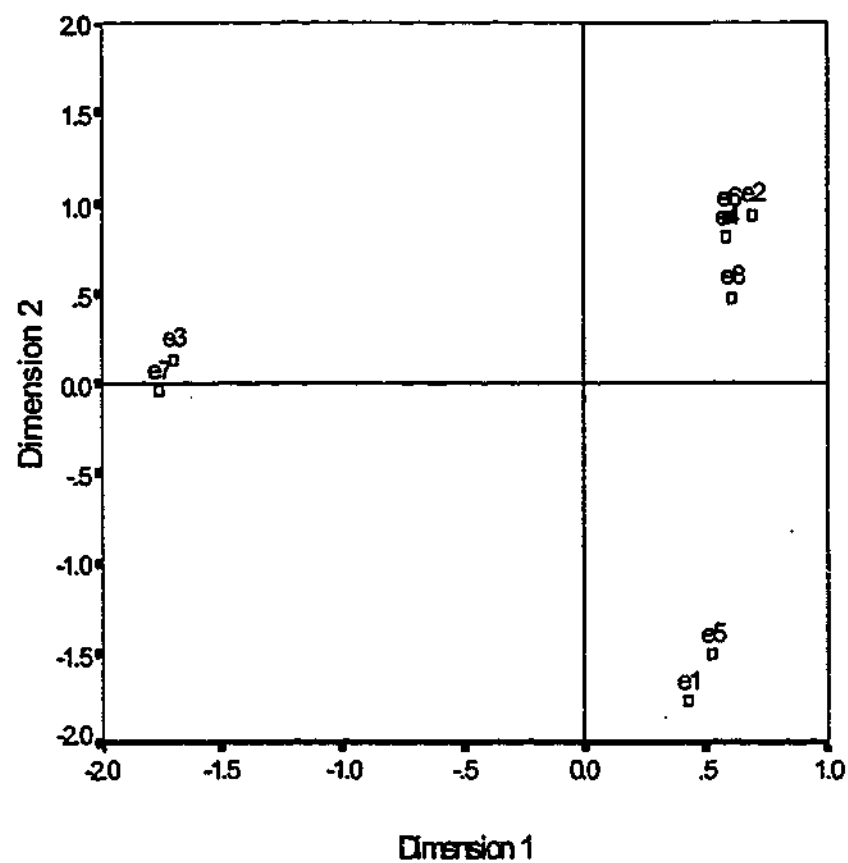
**Table 7.12: Weight Vectors and Lengths for the Elements in Peter's Grids**

	Weight 1 $w_{k,1}$	Weight 2 $w_{k,2}$	Length $L_k$	Weight 1 Normalised $w_{k,1}^*$	Weight 2 Normalised $w_{k,2}^*$	Normalised Length $\left( \sum_{a=1}^r w_{k,a}^{*2} \right)$
Grid 1	0.88	0.39	0.96	0.91	0.41	1.00
Grid 2	0.67	0.37	0.76	0.88	0.48	1.00

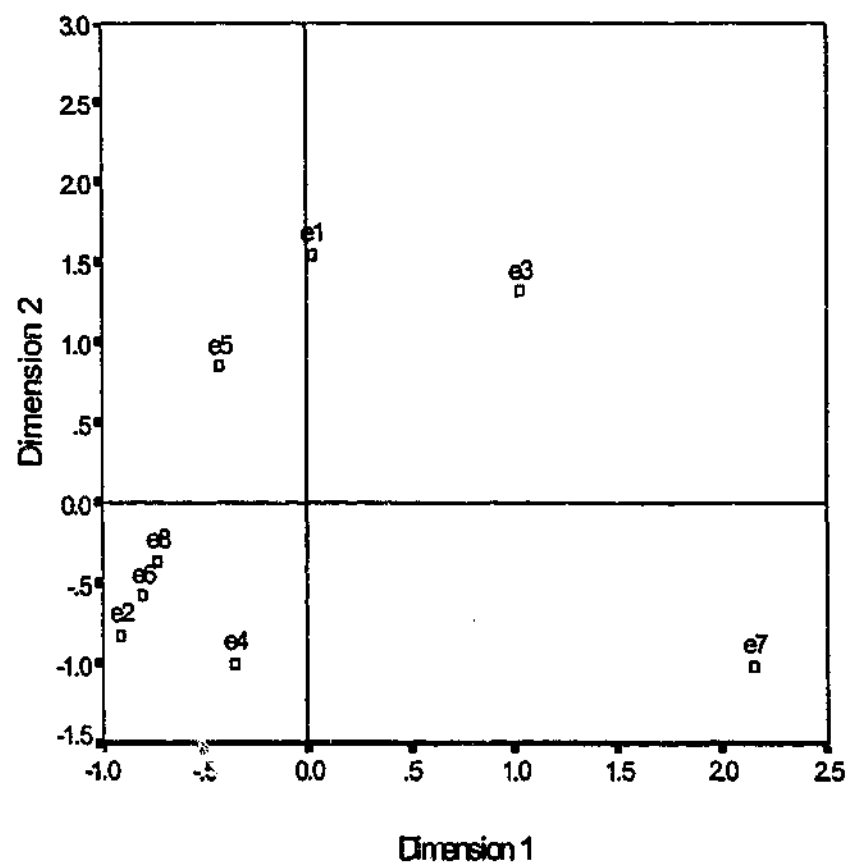
**Table 7.13: Vector Directions, Lengths and Angular Variation for the Elements**

$w_1$	$w_2$	$\bar{R}$	$\bar{S}$	$S^*$
0.88	0.47	1.00	0.00	0.00

The index of angular variation suggested that there had been no change in the element structure in the period between the two interviews. This was also suggested by the element maps, which are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.12: Element Maps for Peter's Work-Nonwork Activities Grid

In the second map some of the elements are more dispersed. However, they are grouped in an almost identical manner. These maps supported the contention that Peter's construing of work and nonwork activities was stable over the period between the first and second interview.

An inspection of the coefficients in the dissimilarity matrix for the second occasion data showed that all but three had decreased when compared with the first occasion matrix. The element pairs which registered increases were entries [2,6] (0.27 to 0.39), [3,7] (0.34 to 0.60) and [4,8] (0.37 to 0.39). The first mentioned here indicates that the dissimilarity between elements two and six was greater on the second occasion. A similar interpretation applies to the other two. It may be seen in the second map that the spatial relationship between each of these element pairs was altered but that the greatest change is indicated for elements three and seven. However, since the majority of entries in the second occasion dissimilarity matrix were less than those in the first, it was expected and it transpired that the element consensus value increased from 0.42 on the first occasion to 0.50 on the second. This suggested that the underlying structure was tighter than when evaluated at the first interview, but this was not reflected in the second occasion map. However what is recorded in the map is the spatial arrangement of elements based on their relationship to each other. Thus the overall consensus of elements (constructs) may increase or decrease but this does not mandate that an element map (or construct map) be necessarily tighter or looser.

This proposition was tested by recasting the dissimilarity coefficients for each occasion matrix in terms of ranks in ascending order with the least dissimilar pair(s) ranked first. It was observed that the ranks for the element pairs [2,6], [3,7] and [4,8] were 1, 2, and 3

on the first occasion and 3, 17 and 3 on the second occasion. It may be seen that the pair [3,7] dropped from second to seventeenth in terms of ranks and that this significant variation is reflected by the pronounced change in the positioning of these elements in the second map. Similarly there was little change in the position of the element pairs [2,6] and [4,8]. In the case of the former pair the ranking dropped minimally from 1 to 3 whilst in the case of the latter pair it remained unchanged.

In summary, spatial maps are not a function of the values in dissimilarity matrices but of their relationship to one another. When the relationship between the values changes in relative terms then the configuration of a map will also change.

### **The Culmination of the Methodological Development**

The development and testing of the FPWMDS method for the analysis of cognitive structure over time completed the development of the analytical methods required for the analysis of the repertory grids. In terms of methodological work it represented the culmination of a methodology founded on the alternative representation of repertory grids as fuzzy entities. The development and application of the Fuzzy-PCP model yielded results in a form that rendered them amenable to multidimensional scaling. Ultimately it was possible to compare the underlying form of cognitive structures in first and second occasion grids using FPWMDS. An index measure of stability or change in the form cognitive structures was also developed. The logic of FPWMDS was also applied to the elements such that another vantage point was provided from which to view the repertory grid data.

Each of the grids presented from this point on incorporates this methodological design to present an interpretation of them. The work-People grid elicited from Peter is presented below.

### Peter's Work-People Grid

Peter was asked to nominate eight elements according to the categories shown in the lower portion of Table 7.14

**Table 7.14: Peter's Work-People Grid**

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : I like them	0.3	0.5	0.9	1.0	1.0	0.8	0.8	0.9	Have to deal with them
$\bar{C}_2$ : I can relate to	0.4	0.7	0.8	1.0	1.0	0.0	0.8	0.7	Clash
$\bar{C}_3$ : Croatian	1.0	1.0	1.0	1.0	0.0	0.9	1.0	1.0	Australian
$\bar{C}_4$ : Can listen to	0.2	0.5	0.4	1.0	0.8	0.5	0.9	1.0	Obey*
$\bar{C}_5$ : Fun	0.3	0.5	0.7	1.0	0.9	1.0	0.7	1.0	Pain*
$\bar{C}_6$ : Go out of my way to	0.2	0.4	0.9	0.9	0.0	0.4	1.0	0.9	Checks up on me
$\bar{C}_7$ : Respect	0.5	0.8	0.8	0.9	0.8	0.0	1.0	1.0	Ignore
$\bar{C}_8$ : Real World	0.8	0.9	0.9	0.9	0.9	0.0	0.9	0.2	Dream
Element Types					Nominated People				
$e_1$ : (a person who is important to me )					Supervisor				
$e_2$ : (a person who is important o me)					Boss				
$e_3$ : (a person who I like)					Bob				
$e_4$ : (a person who has my ideal role )					Boss as entrepreneur				
$e_5$ : (a person who I dislike)					George				
$e_6$ : (a person who I see frequently)					Mario				
$e_7$ : (a person who I see frequently )					Tony				
$e_8$ : (The most successful person I know)					Boss				

The affective content of this grid was more striking than was observed in the work-nonwork activities grid. Affect was plainly evident in the first, second and fifth construct. It was also implicit in constructs four, six and seven. Thus Peter appeared to construe

his work colleagues primarily in terms of the feelings he had about them. It will be shown that in the period between the two interviews there was a substantial alteration in the affect that Peter directed at some of his work colleagues.

The analytical results, which pertain to this grid for both occasions are shown below.

**Table 7.15: Golden Section and FUZZYGRID Results for Peter's Work-People Grid**

Measures	Grid 1	Grid 2
Golden Section Ratio <sup>(a)</sup>	72:28	51:49
Construct Consensus	0.65	0.55
Element Consensus	0.62	0.50

(a) For both occasion grids the Golden Section Ratio was calculated for six not eight constructs. The reason for this was that no evaluative component could be inferred for constructs four and eight.

The Golden Section Ratio shows that at the time of the first interview Peter was positively disposed to his work colleagues but that when the second interview was conducted this did not appear to be the case. The construct consensus coefficient dropped from 0.65 to 0.55 suggesting that the cognitive structure was looser on the second occasion that it had been on the first.

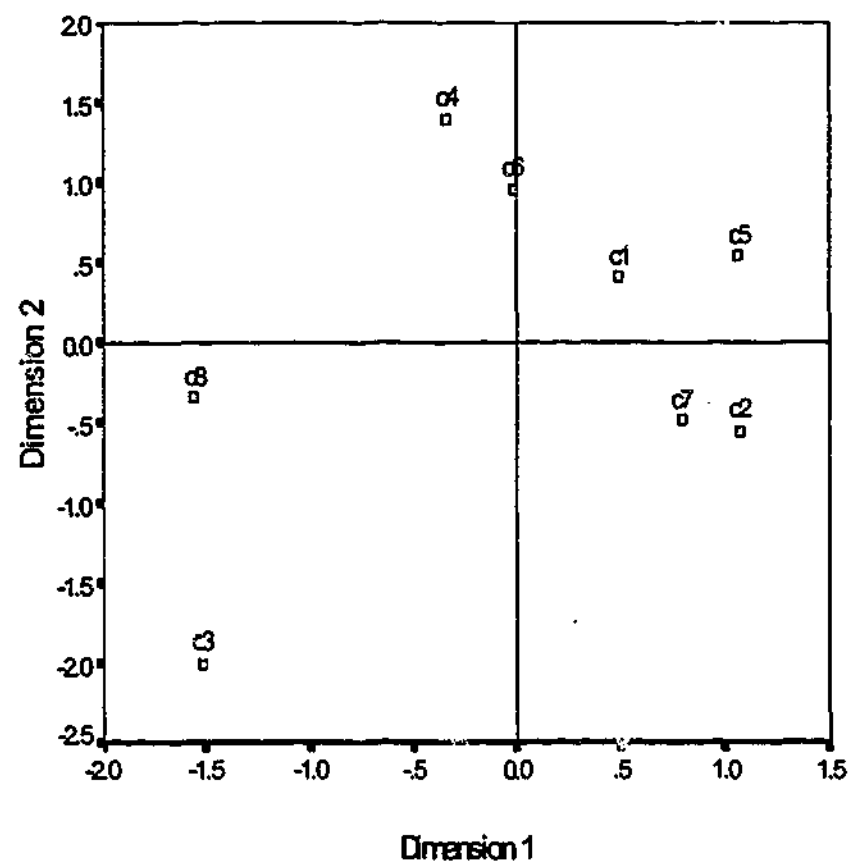
The results of the fixed-point analysis are shown below.

**Table 7.16: FPWMDS Model Statistics for Peter's Work-People Grid**

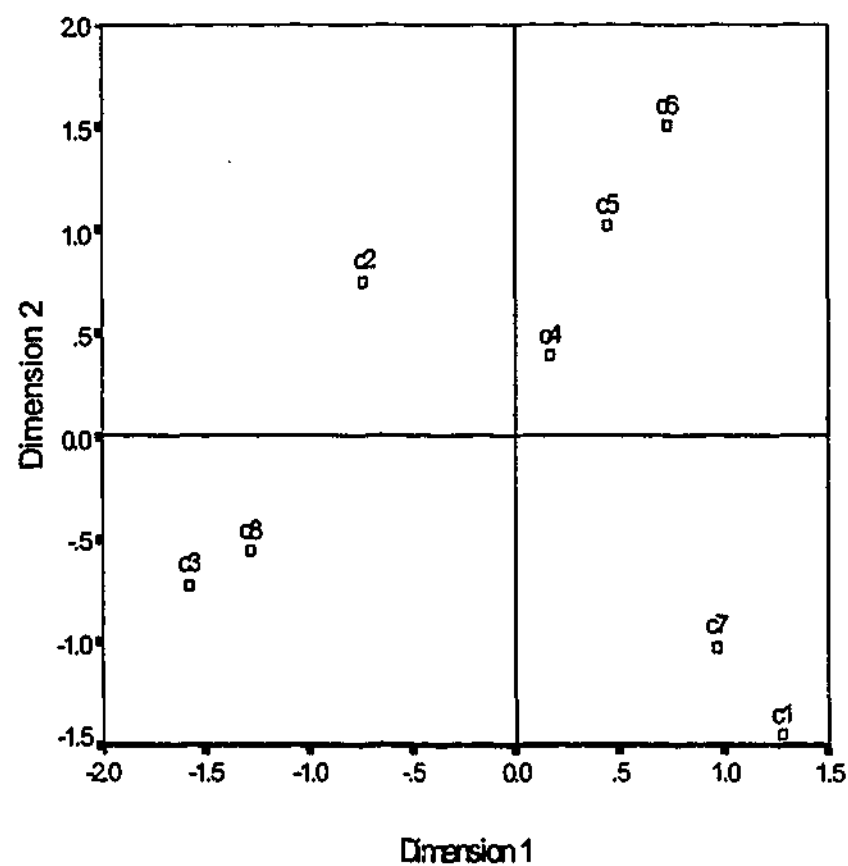
Configurations	R-square	Stress	Weight 1	Weight 2
Reference Configuration (Grid 1)	0.93	0.14	0.83	0.49
Grid 2 Fitted to Reference Configuration	0.22	0.40	0.38	0.26
Index of Angular Variation = 0.00				

These results show that the second grid did not fit well to the reference configuration. This was indicated by the low r-square (0.22) and the high stress value (0.40). However, the index of angular variation suggested that the form of the cognitive structures was invariant. The construct scaling maps for the reference configuration and the second occasion grid are shown below.





First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.13: Construct Maps for Peter's Work-People Grid

### Commentary on the Construct Maps

The reference configuration shows quite clearly the distinctiveness of those constructs that were affective and those that were used in a descriptive but not an evaluative manner. Thus, construct three *Croatian – Australian* and construct eight *real world – dream* are located near each other in the south-west quadrant of the map. The affective constructs stand in a loose cluster in the north-east quadrant. The second occasion map again shows the proximity of constructs three and eight but the affective constructs are more disparate.

Whilst the index of angular variation whose value was zero did not suggest any change in the form of cognitive structure, further investigations were undertaken because the Golden Section Ratio was markedly different on the second occasion. Specifically the proportion of ratings on the negative poles had increased from 0.28 on the first occasion to 0.45 on the second. Similarly the construct consensus coefficient was down from 0.65 to 0.55 on the second occasion. Earlier it was indicated that because of the way in which the consensus measure was derived it was necessary to use the Golden Section Ratio as an indicator of a generalised change in outlook. A participant could on one occasion construe primarily on one pole of the elicited constructs whilst on another construe primarily on the opposing poles of those same constructs. However, as noted by Adams-Webber (1979, p.34) such outcomes do not necessarily point to a change in the form of a cognitive structure.

Since it appeared that on the second occasion Peter was more negatively disposed to his coworkers, the ratings in the first and second occasion grids were recast so as to show membership values on the negative poles. FUZZYGRID was then used to

generate consensus measures and another FPWMDS was run. The results of that analysis and the relevant construct maps are shown below

**Table 7.17: Measures Based on Negative Poles for Peter's Work-People Grid**

Measures	Grid 1	Grid 2
Golden Section Ratio <sup>(a)</sup>	28:72	49:51
Construct Consensus	0.46	0.51
Element Consensus	0.32	0.50

(a) For both occasion grids the Golden Section Ratio was calculated for six not eight constructs. The reason for this was that no evaluative component could be inferred for constructs four and eight.

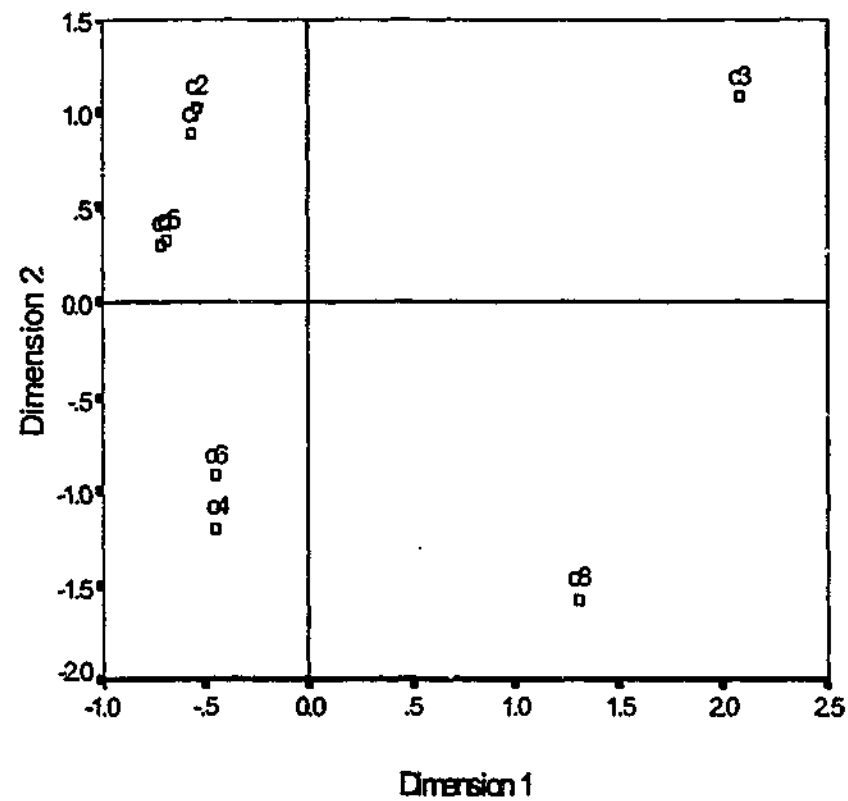
These results show that in the case of the constructs and elements the consensus coefficients were higher on the second occasion. Thus, there was an inverse but not proportional relationship between the measures, based on the positive poles that were observed to fall and those based on the negative poles that were observed to rise. This was expected because the measures are based on fuzzy sets and not on dichotomous choice or interval level rating scales where reversing ratings makes no difference to measures such as the correlation coefficient.

The results of the fixed-point analysis are shown below.

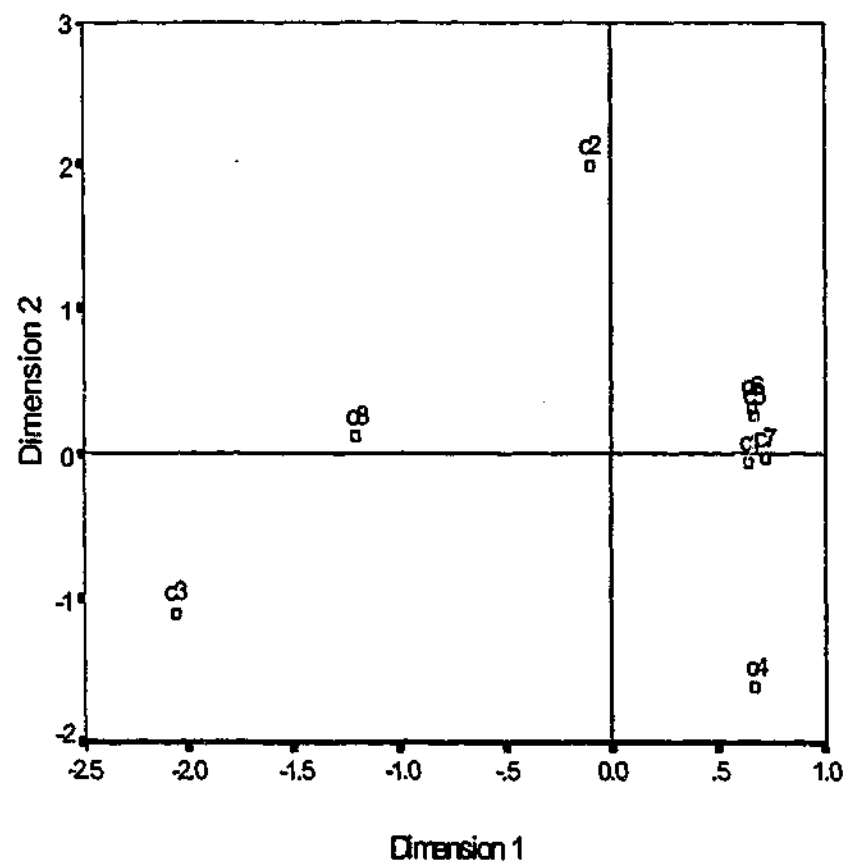
**Table 7.18: FPWMDS Results for the Constructs Based on Negative Poles**

Configurations	R-square	Stress	Weight 1	Weight 2
Reference Configuration (Grid 1)	0.88	0.18	0.76	0.54
Grid 2 Fitted to Reference Configuration	0.65	0.35	0.79	0.17
Index of Angular Variation = 0.08				

This analysis shows that the second grid did not fit the first very well (r-square = 0.65 and stress = 0.35). The analysis also shows that the structure had altered somewhat as indicated by the coefficient for index of angular variation, which was 0.08. The scaling maps that relate to this analysis are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.14: Construct Maps for Peter's Revised Work-People Grid

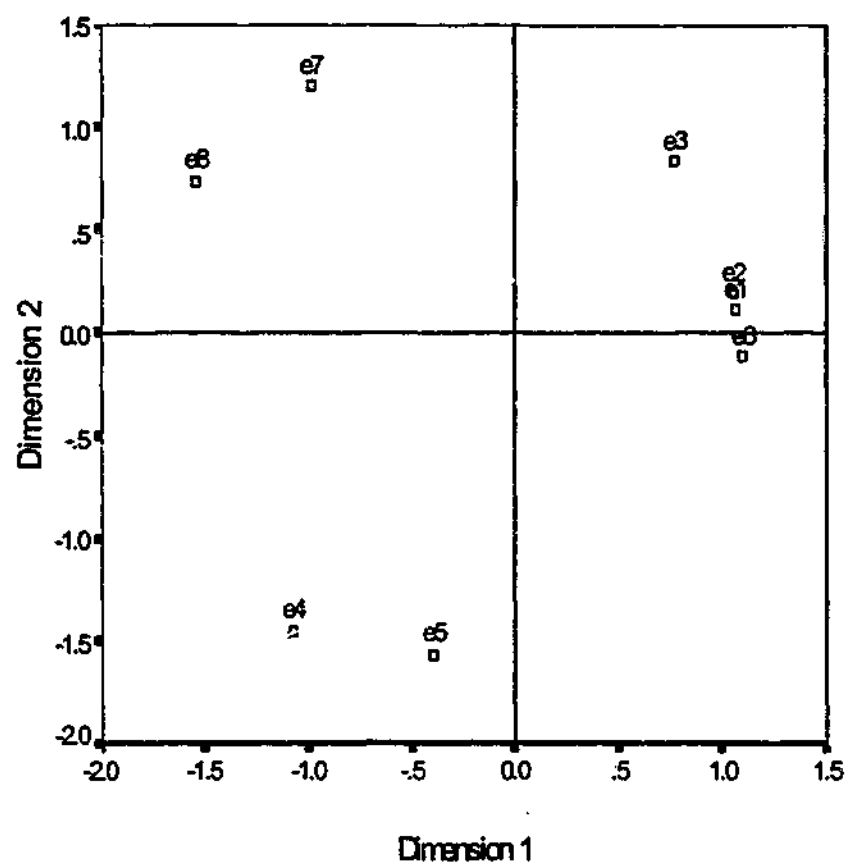
The first map shows again the distinctiveness of the affective constructs, in that they are remote from constructs three and eight that had already been interpreted as having no affective content. The configuration of the affective constructs is open but not unstructured.

In the second map constructs one, five, six and seven are almost indistinguishable from one another. An examination of the entries in the second occasion dissimilarity matrix indicated that the dissimilarity between these constructs was noticeably lower than between them and the others. Thus it was inferred that the discriminative capacity afforded by these constructs was minimal on the second occasion. The negative poles of these constructs, construct one (*have to deal with them*), five (*pain*), six (*checks up on me*) and seven (*ignore*) indicated an aversion by Peter to some of his coworkers that was not strongly indicated on the first occasion. An analysis of the elements in both grids using FPWMDS was undertaken to validate or repudiate the inference that Peter's outlook was more negative on the second occasion. If this was so, then it was expected that the second map would be tighter than the first. The results of the FPWMDS are shown.

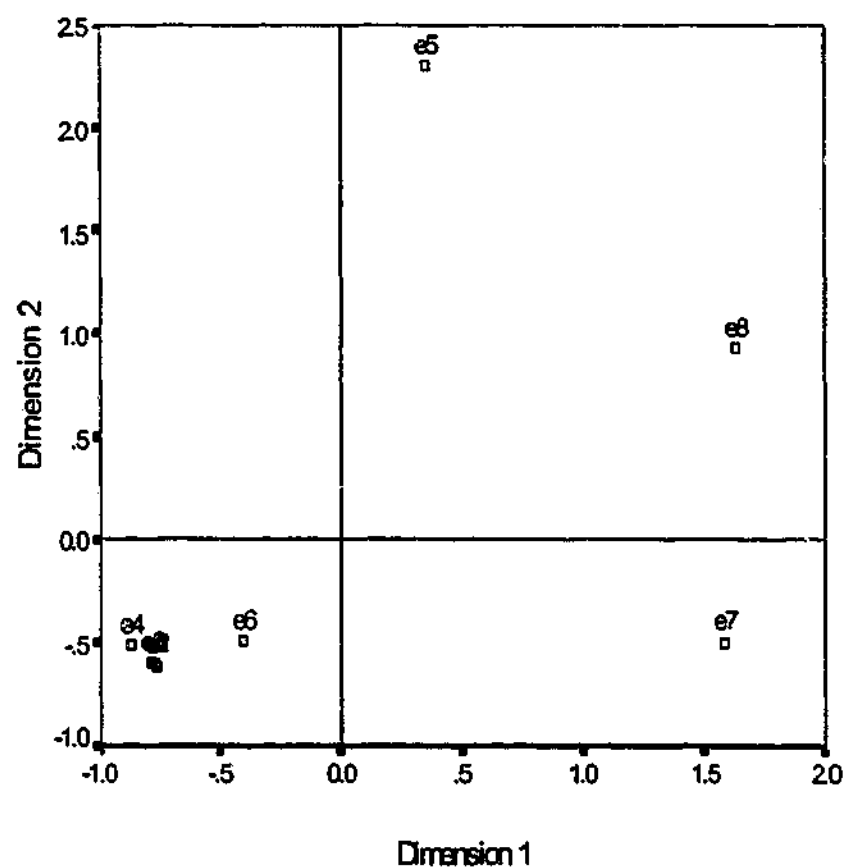
**Table 7.19: FPWMDS Results for the Elements Based on Negative Poles**

Configurations	R-square	Stress	Weight 1	Weight 2
Reference Configuration (Grid 1)	0.62	0.28	0.63	0.48
Grid 2 Fitted to Reference Configuration	0.35	0.37	0.43	0.41
Index of Angular Variation = 0.00				

In relation to the reference configuration the second grid was not a good fit (r-square = 0.35). However, the coefficient for the index of angular variation (0.00) suggested that the form of the element configuration was unchanged. The element maps are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.15: Element Maps for Peter's Work-People Grid

The configuration of elements in the first map reflects Peter's varied disposition to his coworkers at the time of the first interview. The prominent characteristics of the map are the proximity of elements seven and eight, the former being the most successful person who was the Boss and the latter also the Boss as an entrepreneur. The distinctiveness of these elements was not surprising since Peter aspired to be an entrepreneur. He respected his Boss for his success and differentiated the role of entrepreneur as a dream on the construct *real world – dream*.

From the ratings on the negative poles it was clear that Peter was more positively disposed to Tony and Bob than he was to his other coworkers. This is indicated by their separation from the others in the first map. They are elements four and five located in the south-west corner of the map. The four elements, which make up the cluster along the eastern boundary of the map, comprise the supervisor the Boss, George and Mario. The first three elements, one, two and six are closest to each other in the map. The commonality between them was that they were each authority figures. Peter indicated a strong need for autonomy at the first interview. When speaking about his work needs he said that he expected his Boss to understand 'the way I like to work, free to produce as I wish, his results in production – my methods'. Thus, he was negatively disposed to checking behaviour. This was indicated by the ratings of these three figures on the construct *checks up on me – go out of my way to be with*. They were 0.8, 0.6 and 0.6. In contrast Mario (element three) did not appear to be similarly inclined as evidenced by the rating of him on the same construct which was 0.1. It may be seen that element three, which represents Mario, is located adjacent to but removed from the triad representing the supervisor, the Boss, and George.

Peter's inclination to be more negative about his coworkers on the second occasion is evidenced by the positioning of the elements in the second map. The arrangement of elements is approximately the inverse of that observed in the first map. All but Bob (e5) were construed in quite a negative fashion. However, elements seven and eight remained isolated from the rest and relatively close to each other, indicating Peter's unwavering endorsement of entrepreneurs.

In summary, the initial interpretation of the grids based on the ratings on the positive poles suggested that the underlying cognitive structure was stable. Whilst this may have been the case, the change in the Golden Section Ratio indicated that the grid ought to be analysed in terms of ratings on the negative poles. That analysis showed that the cognitive structure was stable, but more constricted on the second occasion such that Peter was in general more negatively disposed to his work colleagues. That this was a generalised change in outlook was evidenced by the second occasion element map where all but three of the elements were construed similarly on the second occasion. Two of these three elements were descriptive of an idealised conception that Peter had of entrepreneurs that was positive and unwavering. It was clear that he differentiated between his Boss as an authority figure, and as an entrepreneur and successful person. Similarly Bob was a coworker with no authority over Peter who was consistently construed in a positive way. Thus, he was represented as an isolate in both element maps. An analysis of the third grid elicited from Peter is presented below.



## Peter's Nonwork-People Grid

The third grid elicited from Peter concerned the people in his nonwork domain. This grid and the analysis is presented below.

Table 7.20: Peter's Nonwork-People Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : My wife's side	0.5	0.5	1.0	0.0	0.0	1.0	0.0	0.0	My side*
$\bar{C}_2$ : I love	1.0	1.0	0.8	0.9	0.9	0.2	0.8	1.0	I dislike
$\bar{C}_3$ : To be happy									Family <sup>(a)</sup>
$\bar{C}_4$ : Immediate family									My own blood <sup>(a)</sup>
$\bar{C}_5$ : By choice	1.0	0.9	0.5	0.5	0.7	0.0	1.0	1.0	Not by choice
$\bar{C}_6$ : Family	1.0	1.0	0.9	0.9	0.9	0.0	1.0	1.0	Outsider
$\bar{C}_7$ : Related to my work	1.0	1.0	0.2	0.2	0.4	0.0	1.0	1.0	Unrelated to my work
$\bar{C}_8$ : Mine	1.0	1.0	0.2	0.9	0.9	0.0	1.0	1.0	Not mine
Element Types						Nominated Person or Role			
$e_1$ : (a person who is important to me)						My child			
$e_2$ : (a person who is important to me)						My wife			
$e_3$ : (a person who I see frequently)						Parents-in-law			
$e_4$ : (a person who I see frequently)						Grandma			
$e_5$ : (a person I like)						My brother			
$e_6$ : (a person who I dislike)						Lucy			
$e_7$ : (myself as a father)						Myself as a father			
$e_8$ : (my ideal self)						My ideal self			

(a) These constructs were eliminated. The explicit and implicit poles of the third construct could not be reconciled. Peter could not rate the sixth element on either the third or the fourth construct.

The semantics in the constructs and Peter's use of the possessive case when describing his wife and child suggested a generic *ingroup* versus *outgroup* (Tajfel & Turner 1986) construing of those in his nonwork world. When the constructs were elicited there were intimations from Peter, which suggested that constructs four, five and eight were a quasi-affective basis of discrimination.

For example during the first interview there was an aside in which Peter and Maria discussed Lucy whom Peter disliked. From the tone of the exchange there were indications that she had entered Peter's world not by his choice but by virtue of his marriage to Maria. This is substantiated by the manner in which Peter construed Lucy particularly on constructs one, five, six and eight.

From the grid ratings it may be seen that Peter construed his wife, his child, himself as a father and his ideal self as related to his work. It was inferred that he construed his wife and child in this way because of his responsibilities to them. Work was also one avenue for expressing the identities, 'myself as a father and my ideal self'. Thus, these were construed as related to work.

For the constructs the scaling results presented are based on the reduced grid which comprises six constructs. Because of the reduced size of the grid only one and two-dimensional solutions for the CMDS were feasible. However, the model statistics for a solution in two dimensions were good. The two dimensional solution was also good for the elements. Thus for both occasion data the preferred dimensionality was the same for the constructs and the elements. The full complement of elements were available for analysis since eliminating constructs (rows) has no affect on the number of elements (columns). The analytical results are shown below.

**Table 7.21: Golden Section and FUZZYGRID Results for Peter's Nonwork-People Grid**

Measures	Grid 1	GRID 2
Golden Section Ratio <sup>(a)</sup>	81.19	80.20
Construct Consensus	0.63	0.66
Element Consensus	0.61	0.66

(a) The Golden Section Ratio was calculated only in relation to constructs two, five, six and eight. Constructs one and seven were not considered as no affect could be gleaned from these.

The results of the fixed-point analysis for the constructs and the elements are shown below.

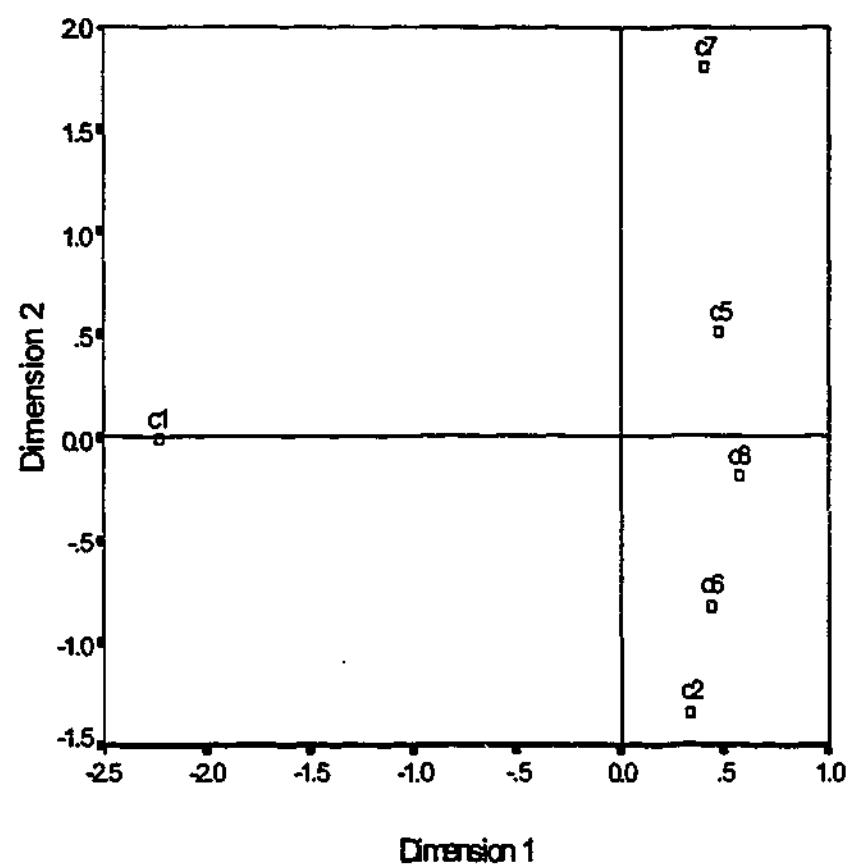
**Table 7.22: FPWMDS Results for Peter's Nonwork-People Grid**

Configurations For Constructs	R-square	Stress	Weight 1	Weight 2
Reference Configuration (Grid 1)	0.99	0.06	0.97	0.21
Grid 2 Fitted to Reference Configuration	0.18	0.38	0.34	0.24
Index of Angular Variation = 0.07				
Configurations For Elements				
Reference Configuration (Grid 1)	0.96	0.14	0.90	0.37
Grid 2 Fitted to Reference Configuration	0.56	0.41	0.73	0.18
Index of Angular Variation = 0.00				

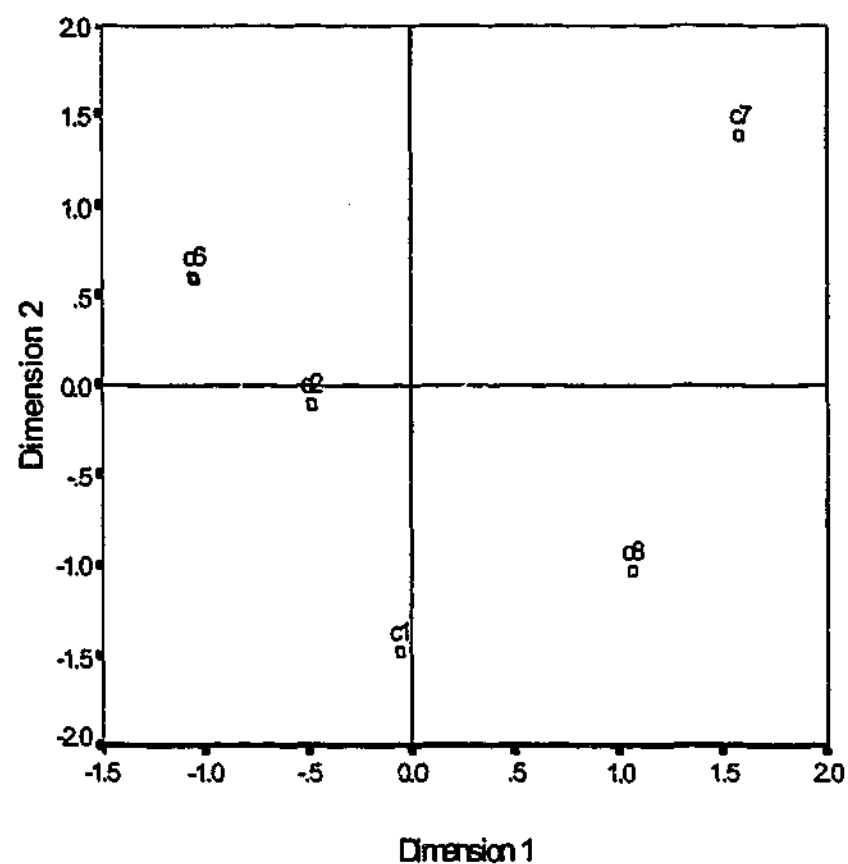
### **Commentary on FPWMDS Results**

The results show that for the constructs and the elements the second occasion data did not fit well to the reference configuration. This is indicated by the lower r-square and higher stress values reported for the second occasion grids. In the case of the constructs a change in form was indicated by index of angular variation whose value was 0.07. No change in form was indicated in relation to the elements.

The scaling maps for the constructs and elements are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.16: Construct Maps for Peter's Nonwork-People Grid

### Commentary on the Construct Maps

The first map is relatively open and characterised by a linear configuration of constructs along the eastern boundary. Construct seven *related to my work-unrelated to my work* is somewhat removed. These constructs unlike the others were not used to indicate the status of people in terms of their *ingroup* or *outgroup* membership but to relate them to Peter's work or nonwork domain. The first construct is clearly disassociated from the others. This construct was used to classify the people in terms of their relationship to Peter or his wife. The dissimilarity matrix from which this map was derived is shown below.

Table 7.23: Dissimilarity of Constructs for Nonwork-People (First Occasion)

Fuzzy Construct Subsets	$\tilde{C}_1$	$\tilde{C}_2$	$\tilde{C}_5$	$\tilde{C}_6$	$\tilde{C}_7$	$\tilde{C}_8$
$\tilde{C}_1$	0.00	0.85	0.87	0.86	0.88	0.89
$\tilde{C}_2$	0.85	0.00	0.32	0.12	0.51	0.26
$\tilde{C}_5$	0.87	0.32	0.00	0.25	0.26	0.27
$\tilde{C}_6$	0.86	0.12	0.25	0.00	0.43	0.19
$\tilde{C}_7$	0.88	0.51	0.26	0.43	0.00	0.34
$\tilde{C}_8$	0.89	0.26	0.27	0.19	0.34	0.00

This matrix shows the distinctiveness of the first construct in relation to every other by the magnitude of the dissimilarity coefficients. Referring only to the elements above the main diagonal which mirror those below it may be seen that the dissimilarity coefficients pertaining to the first construct are substantially higher than the others. These large differences are reflected in the isolate status of this construct in the map.

The second map shows a different configuration of constructs. It may be seen that constructs one and seven stand removed from linear configuration comprising constructs five, six, two and eight. It may also be seen that constructs five and six are

indistinguishable from one another. The dissimilarity matrix from which the second map was derived is shown below.

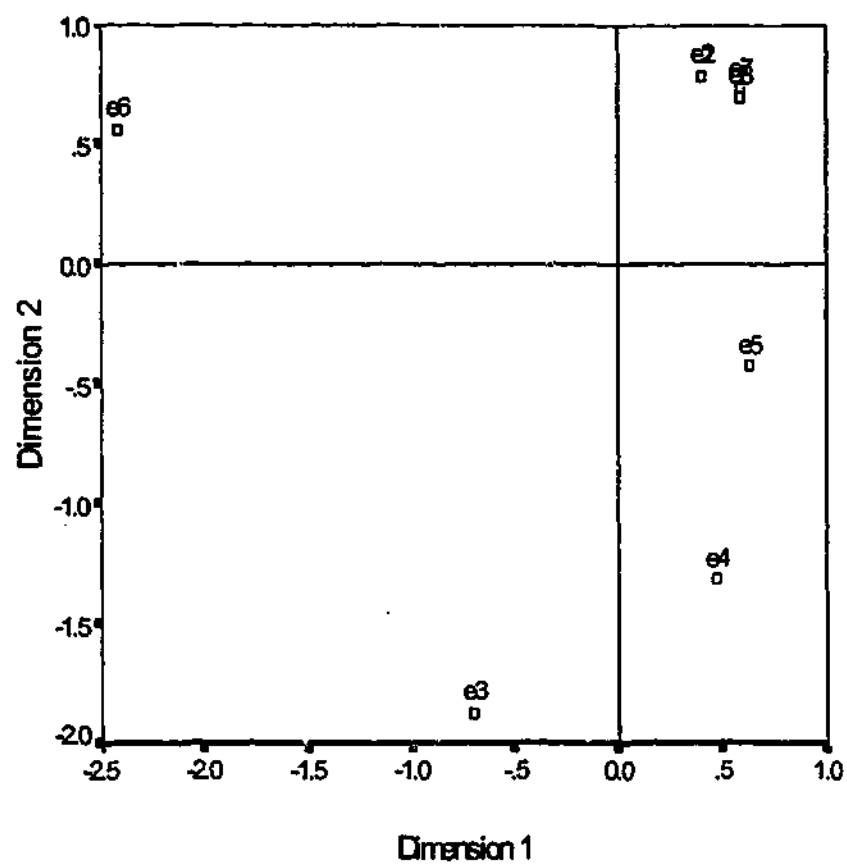
**Table 7.24: Dissimilarity of Constructs for Nonwork-People (Second Occasion)**

Fuzzy Construct Subsets	$\tilde{C}_1$	$\tilde{C}_2$	$\tilde{C}_5$	$\tilde{C}_6$	$\tilde{C}_7$	$\tilde{C}_8$
$\tilde{C}_1$	0.00	0.67	0.69	0.68	0.87	0.69
$\tilde{C}_2$	0.67	0.00	0.13	0.11	0.84	0.14
$\tilde{C}_5$	0.69	0.13	0.00	0.08	0.82	0.06
$\tilde{C}_6$	0.68	0.11	0.08	0.00	0.82	0.06
$\tilde{C}_7$	0.87	0.84	0.82	0.82	0.00	0.82
$\tilde{C}_8$	0.69	0.14	0.06	0.06	0.82	0.00

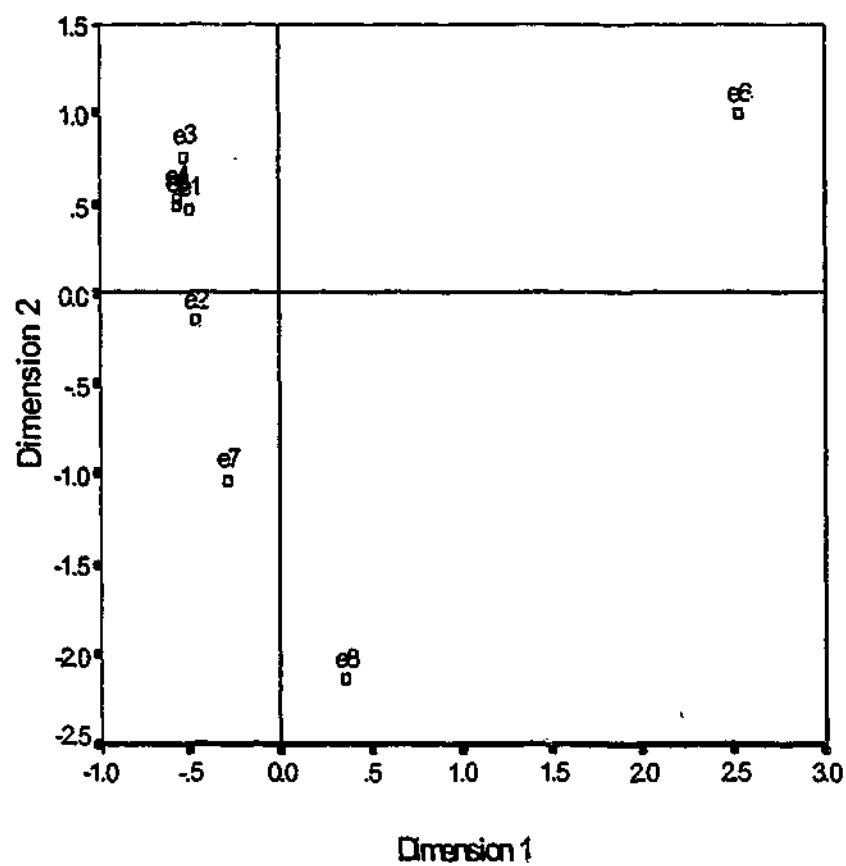
Again the first construct is distinctive from the others but so too is construct seven. An examination of the ratings of construct seven showed that where on the first occasion Peter had strongly construed his wife, his child, himself as a father and his ideal self as *related to his work* he did not do so on the second occasion. The ratings for the elements in the order mentioned were [1.0, 1.0, 1.0, 1.0] on the first occasion and [0.1, 0.1, 0.5, 0.7] on the second occasion. Thus, on the second occasion he disassociated his wife and child from the world of work but maintained an association between himself as a father and his work, and more strongly in the case of his ideal self. This was consistent with Peter's sense of responsibility in relation to his role as a provider but also with his strong motivation to be successful through achievements in the work domain. As mentioned he was motivated to become an entrepreneur.

In summary, although there was some change evident in the form of the cognitive structure it was of a minimal amount and did not indicate any radical change in outlook.

The element maps for each occasion are shown below.



First Occasion Reference Configuration



Second Occasion Element Map

Figure 7.17: Element Maps for Peter's Nonwork-People Grid

### Commentary on the Element Maps

The first map shows one tight cluster, a looser dyad and two isolates. The isolate which is located on the north-western boundary refers to Lucy the friend of Maria's whom Peter strongly disliked. The tight cluster of elements in the north-eastern corner comprises *my wife, my child, myself as a father and my ideal self*. These were the people with whom Peter identified very strongly. The dyad, which represents Peter's brother and his grandmother, were also people with whom he was strongly connected. It may be seen that the second isolate (element three) represents Peter's parents-in-law. He was somewhat cool about them at the first interview.

The second map shares common features with the first but also shows a change in Peter's construing of those in the nonwork world. Peter was unwavering in his opinion of Lucy. It may be seen that element six, which represents her, is also isolated on the north-eastern boundary. Peter maintained his strong connection with his wife and child but had also drawn in his immediate family members (brother and grandmother) and his parents-in-law into his group of intimates. It may be seen that where in the first map Peter had aligned his role as a *father* (element seven) with his *ideal self* (element eight) this was not evident on the second occasion. Whilst these elements are located close to each other there is sufficient distance between them to indicate that they represented separate identities and that Peter placed his role as a father within his group of significant others. This is indicated by the position of this element in relation to that group.

In summary, when the second interview was conducted, the people in Peter's nonwork world were construed as a tighter coalition. Lucy, the disliked friend of Maria remained



so. Peter had differentiated himself as a father and this identity was somewhat removed from his ideal-self concept.

The next section presents the questionnaire data supplied by Peter.

### Questionnaire Data — Peter

#### Work and Nonwork

Data related to Peter's paid work are shown in Table 7.25 below.

**Table 7.25: Work Related Data for Peter**

Variable	First Interview	Second Interview
Years of work experience	6-10	
Years with current employer	3-5	
Years with previous employer <sup>(a)</sup>	Less than 1	
Hours of work per week	41-50	41-50
Work at home		
Evenings	No	Yes
Weekends	No	Yes
Go to work at on weekends	Now and then	Twice per month
Job satisfaction	2	2
Occupational satisfaction	2	4
Organisational satisfaction	2	2
Job commitment	4	3
Occupational commitment	3	2
Organisational commitment	4	3

(a) Data reported in the first three rows were collected only at the first interview.

Peter's hours of work were typical of twelve other participants in the research. This subgroup was distinguishable from another in which the typical member worked on average in excess of 50 hours per week. Peter's job as a factory hand was not one which demanded long hours of work but overtime was available. It may be seen that Peter reported working at the weekends more frequently on the second occasion. When asked to describe the changes, which had occurred after his son was born, one of Peter's responses was 'I now work for dollars with a sense of responsibility to my family,

to provide for them'. The work done at home was not related to his principal employment.

There was an inconsistency in the occupational satisfaction rating reported by Peter. He rated it as four on a five point scale indicating that he was tending towards complete satisfaction. This was incongruent with the other satisfaction and commitment data.

### **Distinguishing Between Work and Nonwork**

The work-nonwork activities grid showed that Peter was averse to wasting time. He nominated it as a work activity that he disliked and also as the implicit pole of the second construct *productive-time wasting*. When asked to describe the similarities and differences between work and nonwork life the themes of productive effort versus wasting time also emerged as the following extract illustrates:

*Nonwork:* If I'm doing something productive and necessary at home it feels I've achieved something for my wife and I and the time flies. Our project to build our new home sometimes requires something done and learnt about it and so also relates to moving one step closer to that goal. If I wasted time ... it would be better that I worked (especially Saturday) and got paid for it.

*Work:* If I am busy and productive it feels good and the time goes fast, but bad days and long and boring one can be a drag.

When asked to define leisure Peter wrote:

An outing such as a picnic, a drive, BBQ, beach or holiday. Staying home with my wife to play, talk or do something together. Planning things together such as our new home, going out visiting family/friends, shopping for things together unrushed, washing the car or cutting the grass, doing all washing for my wife, working on my computer, resting or watching a video.

Peter's conception of leisure included activities that can be typed as pure recreation as well as those that have the character of work. The notion of leisure as discretion about the use of time was indicated by Peter's use of the term "unrushed".

## Household Work

Peter's self reported contributions to domestic work is shown below

Table 7.26: Peter's Contributions to Household Work

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	3.00	4.50
Grocery shopping	2.50	3.80
Cleaning	0.00	3.00
Ironing	0.00	0.00
Cooking the evening meal	2.00	2.00
<i>Subscore</i>	7.50	13.30
<i>Traditional Masculine</i>		
Gardening	2.50	2.50
House maintenance	2.00	2.00
<i>Subscore</i>	4.50	4.50
<i>Androgynous</i>		
Budgeting	4.00	5.00
Paying bills	7.50	7.50
Negotiations with external agencies	2.00	2.00
<i>Subscore</i>	13.00	14.50
<i>Total Score<sup>(a)</sup></i>	25.50	32.30
Satisfaction with division of household work	4.00	4.00

(a) The maximum achievable total score was 57.5 made up of the sub-score maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.00 for androgynous tasks.

The notable features of these data are that although Maria was working more than 38 hours per week, Peter's contribution to the mundane and repetitive tasks was very low on the first occasion. Whilst he reported an increased contribution on the second occasion it was still very low considering that Maria was working 20 to 30 hours per week at that time. These behavioural data were incongruent with earlier descriptions by Peter of his ideal self as 'caring' and 'helpful'. A rationale for this incongruence was sought.

Peter's score on the Attitudes Towards Women Scale (AWS) Spence and Helmreich (1978) was 26 from a maximum achievable score of 45. It was the lowest score recorded and lower than the mean (37) and median (38) score on the AWS for the participant group. In relation to masculine and feminine attributes, Spence and Helmreich (1978, p. 57) argued that people who score high on attributes typically

associated with the other sex and low on attributes associated with their own sex tend to be more egalitarian in their attitudes than their contemporaries. For example men who score high on the feminine subscale and low on the masculine subscale tend to score higher on the AWS scale. Spence and Helmreich (1978, p. 60) also suggested, that within certain cultures where psychological masculinity and femininity can be equated with agentic-communal difference, the sex-linked distinction may be more rigid. Males may be discouraged from developing and expressing feminine characteristics and females from developing and expressing masculine ones.

As indicated Peter was initially classified although with reservations as masculine according to his score on the PAQ. In contrast his descriptions of his ideal self were interpreted indicating a feminine outlook. However, the indications from the data on the division of household labour and his score on the AWS seemed to validate the masculine classification. It was deduced that the incongruence between Peter's contribution to the household and his descriptions of his ideal self was attributable to the opposition between cultural factors and the religious values which he espoused.

### **The Transition to Fatherhood**

#### **Prospective View**

When asked to write about the changes he anticipated after the baby was born, Peter wrote:

The beginning of a new lifestyle with a new priority, to think for three no longer two. Learning to adjust as a new father to someone we created together, our own child; more new responsibility in taking care of another person that we keep, not someone else's, can't give them back. Responsibility to feed, clothe, shelter, clean, provide health, comfort and sleep. Bring them up with education and protection. New furniture like cot, pram and stroller and car seat for him; baby clothes instead of our own only. Helping the wife more with washing, cleaning

responsibilities around the house, taking more initiative and responsibility in her roles (cooking more); little less sleep and time for ourselves as a couple; putting up with relatives and friends wanting to see our baby.

This was a comprehensive account of the anticipated changes which spanned the issues of relationship adjustment, the responsibility of providing for the baby in the immediate and in the longer term, and the need to show initiative and make a more significant contribution in the home. Again there is a hint of disquiet about friends and relatives in the remark, 'putting up with relatives and friends wanting to be with or see our baby'.

Peter wrote that his needs as a father were:

To communicate to and love my children, spending quality time with them regardless of their sex; to meet their needs as a father and be their lifetime best friend; to live a godly loving life of practical example as a father, husband, lover, provider and supporter; to discipline and teach them correctly in word and deed, bringing them up in the Christian faith with godly morals, first, wisdom, love and respect. To encourage and build up their confidence in life in every aspect; to play with and enjoy their company. To help them grow in education mentally, socially, physically (athletically) and financially via career/vocation encouragement; To teach, correct, showing them how to earn respect and living via value of \$. Developing trust and other dependable qualities in them; to help them in looking after themselves, kindred, their belongings, household duties etc (regardless of sex).

Again the account is a comprehensive one of the father's role as a provider, companion, teacher and role model. The influence and importance of the Christian dimension to Peter is self-evident.

### **Retrospective View**

Recounting the changes in his life after the baby was born Peter wrote:

I now relate to young families with kids as our interest is in how they're doing with children, the child's behaviour and growth pattern gives us a common interest. Learnt to bath my son, change his clothes and nappies etc. I have more time with him quality wise, love doing it with my wife together as well. Means I have to sacrifice my own things many times but I can get up early in the morning to do it anyway. I learnt how to have fun with my own family, it's so rewarding ... it thrills me to know he's part of me and my wife ... All in all I still have my days

when I just can't believe I'm a dad let alone a husband, and yet to both of us it sits just right, just great, like we've been like this the "whole" of our lives! It's too good to be true. We're hoping for a girl next time not too far away so our son can play with his own real life company.

The tone in this extract is one of elation. There is no hint of disaffection with the transition to fatherhood. Peter appeared to have made the necessary adjustments. He was not concerned about his own loss of freedom and flexibility, and modified his regime to accommodate the needs of his son.

By all accounts Peter was well prepared for the changes that would occur when the baby was born. His outlook was optimistic before the baby was born and his enthusiasm had not waned by the second occasion. From his point of view the experience to date had been a positive one.

#### **Descriptions of Self as a Father**

At the second interview Peter was asked to describe himself as a father. His responses are shown in Table 7.27

**Table 7.27: Peter's Descriptions of Self as a Father**

Word/Phrase	Ranking	Rating
Encourager	1	10
Provider	2	5
Playmate	2	10
Disciplinarian	3	7
Lover	4	8
Protector	5	9

These descriptors accord with Peter's multifaceted description of his needs as a father articulated at the first interview. Although the provider role was ranked second in importance Peter scored himself at only five out of ten. It was inferred that the responsibility for providing for the family was shared by Peter and Maria. This inference is supported in that Maria was already working a significant number of paid hours at the

time of the second interview. With the exception of the provider role Peter's high scores on each of the other descriptors were indicative of his perception of the investment he had made in the father role.

## **Babycare**

Peter's reported contributions to babycare are shown below

**Table 7.28: Peter's Contributions to Babycare**

Task	Score <sup>(a)</sup>
Changing nappies	6.00
Bathing	3.00
Night tending	12.00
Play	5.00
Taking the baby for a stroll	2.00
Giving partner time alone	4.00
Total Score	32.00

(a) The maximum achievable score was 50.

Peter's most significant contribution towards babycare was night tending. He indicated that he would get up to care for the baby every second night. He played with the baby for an hour or more every day and made provision for his wife to have time alone once per week.

## **Relationship Issues**

### **Relationship Characterisation and Salience**

Responses provided by Peter about his relationship and role salience data are shown below.

**Table 7.29 Table A5.12 Relationship and Role Salience Data for Peter**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	3	4
Friendship	6	6
Partnership	6	5
<i>Ranking of Roles</i>		
Career	3	3
Marriage	1	1
Family life	2	2
Leisure	4	4
<i>Role Salience Subscales<sup>(a)</sup></i>		
Career		39
Marriage		47
Parenting		49
Home		38

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

Peter gave emphasised the friendship and partnership aspects of his relationship. Peter described his relationship needs as follows:

To share a lot in common, having fun in doing things together; to meet her needs as a husband, father to our children, lover and friend; to know and understand her, to change for the better, to talk and communicate freely and unrestricted with her, knowing what she likes and dislikes; to share our dreams and time together in doing things we enjoy. To be best friends, loving, caressing and holding her freely and without hassles, to work out problems together with practical solutions; to bring out the best in each other sharing our good points or strong points with others if it can help. To go places together which we couldn't do before as husband and wife, on holidays, etc, always with her by my side.

This description was notable in two respects. The first was the strong affective tone. This was not unexpected given that Peter and Maria had been married for a relatively short time. There was also a sense of release suggested in the extract. Marriage allowed Peter and Maria to openly display affection for one another and the freedom to do things together such as go on holidays. The sentiment articulated by Peter was of release from the dictates of others. In response to a question about his leisure needs he wrote:

Taking responsibility for my wife and child in where we choose to go for a drive/visit/picnic/outing or holiday together, to do as we please, see or do what we want in an unpressured, [sic] relaxed manner, anytime we want, without anyone else's influence or permission.

The relationship salience score of 47 was near the maximum of 50. This was significantly higher than the career salience score of 39 and the salience of home which



was 38. However, it was exceeded by Peter's score on parenting salience which was 49. These scores were not surprising given the emphasis which Peter had given to his relationship, family life and his role as a father.

### Marital Satisfaction

Marital satisfaction data reported by Peter are shown below.

**Table 7.30: Peter's Marital Satisfaction Levels and Spouse Relations**

Item	First	Second Interview
Miserable /Enjoyable	7	5
Hopeful/Discouraging	6	4
Free/Tied Down	6	4
Empty/Full*	6	4
Interesting/Boring	6	4
Rewarding/Disappointing	6	5
Doesn't Give Me Much Chance/Brings out the Best in Me*	6	5
Lonely/Friendly	7	5
Hard/Easy	5	4
Worthwhile/Useless	7	5
Overall Satisfaction	6	5
Relationship with Spouse <sup>(b)</sup>		12

- (a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.  
(b) The maximum achievable individual score on this subscale was 35.

These data show that on the second occasion Peter was more reserved about some aspects of his relationship. This was not an unexpected outcome given the adjustment that is required after the birth of the baby. His overall level of relationship satisfaction remained high on the second occasion and the score reported on the spouse relations subscale was not high indicating a minimal level of relationship stress.

## Parenting Stress and Related Measures

Parenting stress and other perceptions of stress reported by Peter are shown below.

**Table 7.31: Parenting Stress Measures for Peter**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	5
Child mood	6
Child adaptability	25
<i>Domain Score</i>	36
<i>Parent Characteristics Domain</i>	
Competence	24
Attachment	7
Restrictions	14
Isolation	10
Relationship with spouse	12
Parental health	13
<i>Domain Score</i>	80
<b>Parenting Stress Index Score</b>	<b>116</b>

**Table 7.32: Stress Ratings Reported by Peter**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	3
Stress as a result of becoming a father	4
Stress from work pressures	4
Relationship stress	3
Overall stress since the birth of the baby	3

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

When asked whether he and Maria had planned to have the baby Peter responded 'I planned to wait about two years after marriage to have children, but our first came after nearly fifteen months we're still rapt!'. Thus, whilst the baby was not planned, the pregnancy was a welcome event. Peter and Maria each intended to take leave for one month after the baby was born and then both would return to work. However, Maria would only work part-time. This is what transpired. At the second interview Maria indicated that she took the baby with her to work and this was working well.

The sub-scale scores and overall score for parenting stress were very low. These were assessed in relation to the other stressor scores reported by Peter and his free responses to other questions pertaining to the transition to parenthood. It was concluded that with the exception of some friction between Peter and his family and relatives the transition had been an easy one. Peter wrote 'I don't like my family and relatives to try and use our son as a means of manipulating us as a couple, we're strongly against that'.

### **Summary of Peters and Maria's Case**

Peter was a man whose life was predicated on a strong commitment to the Christian ideal. So strong was that commitment that he had pursued tertiary studies in theology. This qualification was not suited to employment in the commercial mainstream. During the period of the current research Peter was working as a factory hand. When the first interview was conducted he had been working in that capacity for less than one year. Previous to that he had worked in a sales/marketing role for more than three years but was forced to leave that position because the company went into liquidation. Peter was somewhat concerned about the direction his employment had taken and from the responses supplied by him was unhappy in his work. When the second interview was conducted it was quite plain that the relations between Peter and his coworkers were not good. This was evidenced by the analysis of the work-people grid. Thus, in relation to one major domain of activity Peter was not well satisfied.

In contrast Peter appeared quite happy with his life in the nonwork domain. He articulated a very strong desire to be an active father and to lead by example. The Christian ideal permeated almost every aspect of his private life. The only indications of

tension in his private life were references to manipulations by family and relatives particularly after the baby was born. There was a strong sense from Peter that he wanted to establish and maintain his own family identity and resented intrusions. Notwithstanding this there was evidence emanating from the analysis of the nonwork-people grid that Peter had strong positive feelings for a group of intimates which included his wife, the baby, his grandmother, brother and parents-in-law.

In general Peter's construing of others was dominated by affect. In this respect he was different to other participants in the research who were less inclined to use affective descriptions. This is illustrated by the next case.

#### **Presentation Format for the Remaining Cases**

Sufficient explanation of the development and interpretation of the analytical results for the repertory grids has been now been made. Therefore, the remaining cases presented embody the principal features of the previous presentation without detailed explanation around the measures themselves. Following an introduction and the presentation of biographical detail, the grids are presented in the following order: the work-nonwork activities grid, the work-people grid and then the nonwork-people grid. The FUZZYGRID results and FPWMDS are then presented and discussed. After this the scaling maps are presented first for the constructs and then for the elements. For the constructs and for the elements two maps are presented the first representing, a reference configuration and the second representing that derived for the second occasion data. The latter material in each case, are the data emanating from the questionnaires filled at each interview.

## Case 5: Len and Anne

### Introduction

Len was an Economics graduate who worked for a multinational concern. From the outset it was clear that he was very ambitious and extremely energetic in respect of his career. An accountant by profession, he had at the age of 31 secured a middle management position, completed a master's degree and was about to enroll in another specialist master's program. In choosing this program Len was careful to enlist the support and guidance of his employer. Whilst Len was cognisant of the need to align his studies with the needs of the organisation he had strong views about his career trajectory. His response to an enquiry about his career needs was:

A good paying and challenging job that allows me to use my natural ability rather than my formal qualifications. The job must also allow me to "progress" through the company in a reasonable period of time. The company I work for must be willing to "listen" and accept new ideas if appropriate to their needs.

Len's ambition and some urgency about his career progression was indicated in these remarks. Also indicated was his confidence in his own ability to contribute to the organisation. Another indication of the prominence of career in Len's life was a remark he made in relation to his marriage. When asked about his needs in his marriage he said:

A stable, warm and happy environment where I can be myself. A wife that is ambitious but not to the point where my career is compromised.

From the last remark it can be inferred that Len's career had assumed larger proportions than Anne's. He was motivated to ensure that it remained at the forefront.

Biographical details about Len and Anne are shown below.

**Table 7.33: Biographical Data for Len and Anne**

Variable/Attribute	Len	Ann
Age	31	30
Occupation	Accountant	Supervisor
Highest Educational Qualification	Masters Degree	Undergraduate Degree
Job Status	Middle Management	Junior Manager

As maybe seen Len and Anne were of similar age but different in respect of their educational attainment levels and job status.

### **Descriptions of Self and Ideal Self**

When asked *Who am I?* Len wrote:

- An ambitious individual;
- A professional;
- A sensitive and caring husband;
- An individual with clear goals in life;
- A cynical person.

When asked to describe his ideal self, Len provided the responses shown in Table 7.34 below.

**Table 7.34: Len's Descriptions of his Ideal Self**

Word/Phrase	Ranking	Rating
Intelligent	1	8
High Achiever	1	7
Responsible	2	9
Personable	2	10
Motivated	2	9
Extrovert	3	9
Brave	3	8
Encouraging	4	9

Len's descriptions of himself and his ideal self were indicative of what was to emerge from the analysis of the repertory grids elicited from him. He was as he said 'ambitious intelligent and a high achiever'. As may be seen by the rankings in Table 7.34 intelligence and achievement were fundamental to his sense of self. No score he awarded himself was below eight. It was judged that this did not reflect an unrealistic view of self nor was it indicative of arrogance. Whilst Len did articulate some expressive

qualities such as *a sensitive and caring husband* and *'encouraging* these did not appear to be predominant aspects of self.

In summary, Len presented as a very self-assured person with confidence in his abilities and a positive outlook. His energy level indicated that he was keen if not somewhat impatient to progress his career. He appeared to be in the age thirty transition 'which is an opportunity to reappraise and modify the entry structure' of early adulthood 'and to create a basis for the next life structure' (Levinson 1986, p. 7).

## The Repertory Grids

### Len's Work-Nonwork Activities Grid

The work-nonwork activities grid elicited from Len is shown below.

**Table 7.35: Len's Work-Nonwork Activities Grid**

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Job related	0.9	0.0	0.5	0.0	1.0	0.0	0.9	0.8	Outside work
$\bar{C}_2$ : I like	0.8	0.9	0.1	0.1	1.0	1.0	1.0	1.0	I don't like
$\bar{C}_3$ : Strategy	0.2	0.2	0.0	0.5	1.0	0.7	1.0	0.7	Detail
$\bar{C}_4$ : Career related	0.9	0.1	0.5	0.0	1.0	0.0	1.0	0.9	Not career related
$\bar{C}_5$ : Personal satisfaction	0.5	1.0	0.1	0.1	1.0	1.0	1.0	1.0	Not satisfying
$\bar{C}_6$ : I control	0.8	1.0	1.0	1.0	0.8	1.0	1.0	1.0	No control
$\bar{C}_7$ : Myself	1.0	1.0	1.0	1.0	0.5	1.0	1.0	1.0	Others
$\bar{C}_8$ : Relaxing	0.5	1.0	0.5	0.0	0.5	1.0	0.5	1.0	Time wasting
Element Types				Nominated Activities					
$e_1$ : (a work activity that I like)				Evaluating investment decisions					
$e_2$ : (a nonwork activity that I like)				Play golf					
$e_3$ : (a work activity that I dislike)				Typing reports					
$e_4$ : (a nonwork activity that I dislike)				Movies					
$e_5$ : (a work activity that I perform frequently)				Communicate with senior management					
$e_6$ : (a nonwork activity that I perform frequently)				Cook					
$e_7$ : (a work activity that is important to me)				A professional approach					
$e_8$ : (a nonwork activity that is important to me)				Current affairs					

### Commentary on the Grid

The job related elements and the constructs indicate that Len liked strategy related activities. The activities construed as liked and strategic were *evaluating investment decisions*, *communicating with senior management* and employing a *professional approach* in his work. In relation to nonwork, Len's interest in *current affairs* was not only relaxing but also related to an identified need to keep up with current affairs as an adjunct to his career. Thus the theme of ambition which emerged during the early part of the first interview began to resolve itself in the detail of the first repertory grid.



In reviewing this grid it became apparent that there was considerable polarity in the ratings. When one looks at the grid the number of unit entries is quite striking. When the Golden Section was first employed as a measure it was based on grids in which constructs were rated dichotomously. Thus, it could not be relied on as a measure of polarity since participants were constrained to rate elements on one or the other pole of each construct. However, since a dichotomous rating scheme was not used in the current research it was possible to extract from the ratings in the grids a measure of polarity by counting the number of {0,1} entries in any grid. For this reason it was decided to generate another measure based on the proportion of entries in a grid residing at the positive poles versus the proportion of entries residing at the negative poles. The rationale was that this would be a finer measure that would reflect the tendency for dichotomous (black and white) construing behavior. The ratio measure has been named the *Polarity Ratio*.

The FUZZYGRID and the CMDS results for both occasion grids are shown below. Also shown are estimates of the Golden Section Ratio and the Polarity Ratio for each occasion.

**Table 7.36: FUZZYGRID and CMDS Results for Len's Work-Nonwork Activities Grid**

<i>First Occasion Grid</i>				
Construct Consensus	0.55			
Golden Section Ratio	71:29			
Polarity Ratio <sup>(a)</sup>	47:11			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.51	0.85	0.98
stress		0.47	0.17	0.05
Element Consensus	0.54			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.62	0.95	0.99
stress		0.46	0.11	0.04
<i>Second Occasion Grid</i>				
Construct Consensus	0.54			
Golden Section Ratio	65:35			
Polarity Ratio	42:19			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.59	0.93	0.99
stress		0.41	0.12	0.03
Element Consensus	0.48			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.42	0.91	0.98
stress		0.49	0.17	0.03

(a) Except in the case where all of the entries in a repertory grid are zero or one, the numbers which comprise the polarity ratio do not sum to one. They represent only the unit entries and the zero entries in the grid respectively.

### Commentary on Results

The consensus coefficients for the constructs and the elements were indicative of an open structure. For the constructs the variation in the consensus coefficients between the first and second occasion was insignificant. Similarly the consensus coefficients for the elements did not suggest any significant change in the configuration of the elements over time. Len's positive demeanour was indicated both by the high proportion of ratings on the positive poles of the constructs, and by the Golden Section Ratios being 71:29 on the first occasion and 65:35 on the second. Len was also quite pointed about those activities that he construed in a positive manner. The Polarity Ratio was 47:11 on the first occasion and 42:19 on the second.

The dimensionality suggested by the r-square and stress coefficients produced by the CMDS analysis was two. This was used for the FPWMDS analysis the results of which are shown below.

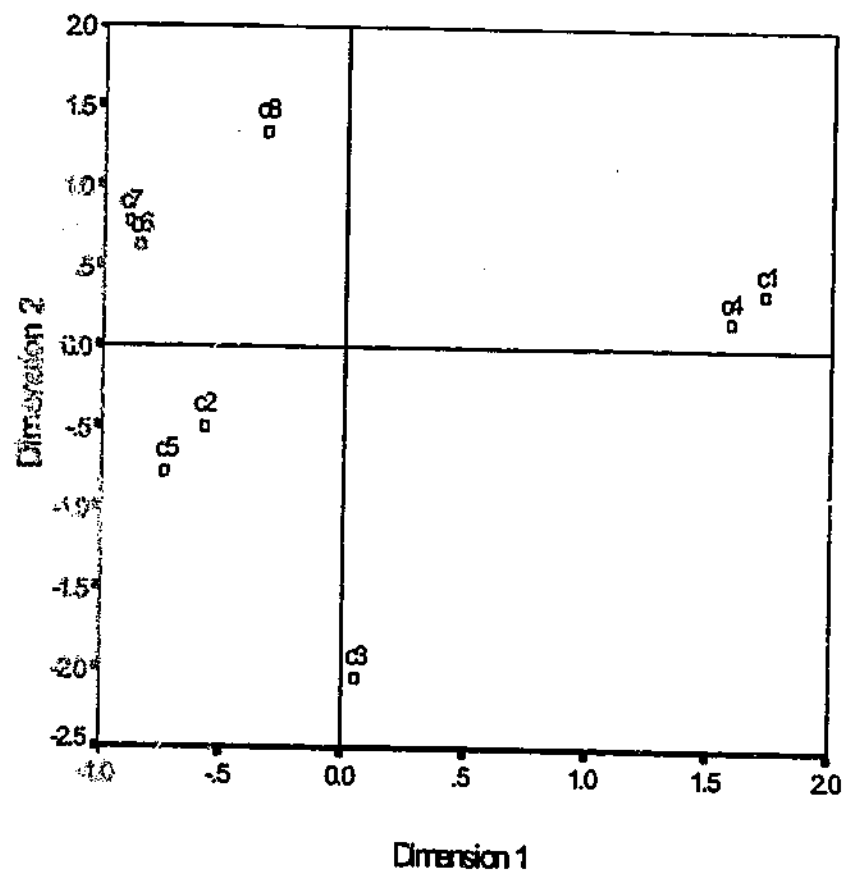
**Table 7.37: FPWMDS Model Statistics for Len's Work-Nonwork Activities Grid**

Configurations	R-square <sup>(a)</sup>	Stress	Weight 1	Weight 2
<i>Constructs</i>				
Reference Configuration	0.85	0.17	0.80	0.47
Second Occasion Configuration	0.34	0.36	0.50	0.29
Index of Angular Variation = 0.00				
<i>Elements</i>				
Reference Configuration	0.95	0.11	0.83	0.50
Second Occasion Configuration	0.75	0.23	0.68	0.53
Index of Angular Variation = 0.01				

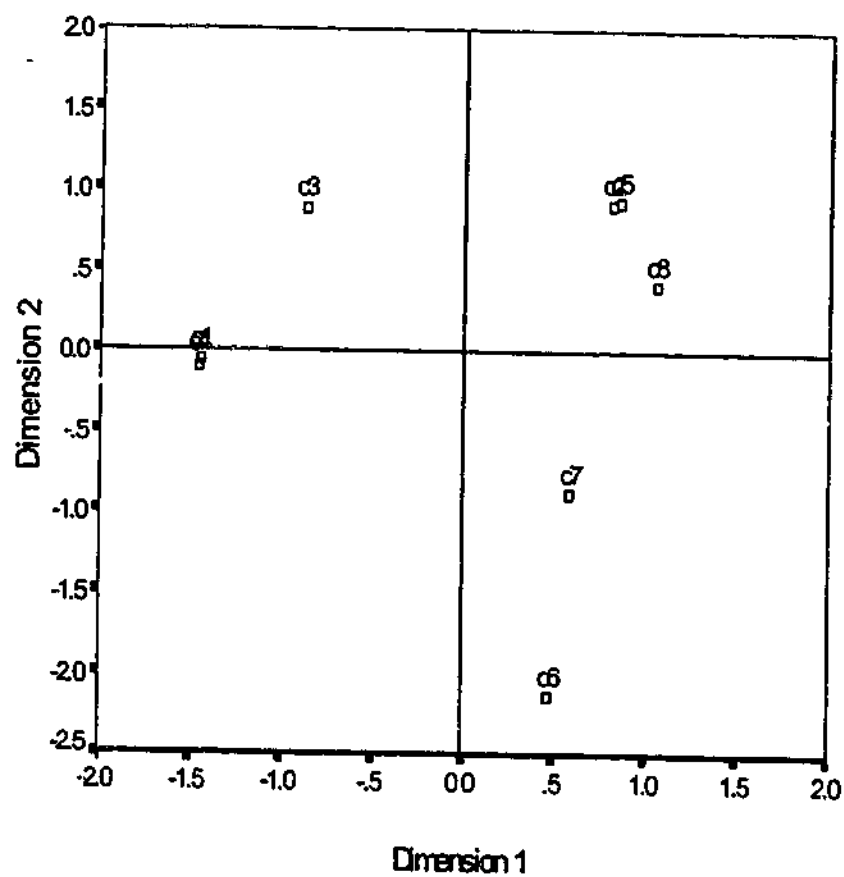
(a) In the case of the reference configurations for the constructs and the elements the r-square and stress coefficients were normally the same as those derived using CMDS. Some insignificant variations from these estimates were observed for some of the FPWMDS analyses. These were attributed to the use of the cloning technique for the replication of dissimilarity matrices. Since the second occasion grids were fitted to the reference configurations it was expected that the r-square coefficients would be lower and the stress coefficients would be higher than those pertaining to the reference configurations. The only circumstance in which these coefficients would be invariant would be when the ratings for a second occasion grid matched exactly those recorded in a first occasion grid.

### Commentary on Results

These results show that for the constructs and the elements a two dimensional solution produced reference configurations with good model statistics. The r-square values were high and the stress values were low. For the constructs the second occasion data did not fit the first occasion configuration very well. This is indicated, by the low r-square, of 0.35 and the high stress coefficients. However, the FPWMDS analysis suggested that there was no variation in the underlying form of the cognitive structure as indicated by the index of angular variation whose value was 0.00. For the elements the second occasion data were a better fit in relation to the reference configuration, and a minimal variation in the element configuration was indicated by the index of angular variation whose value was 0.01. The construct and element maps supported this inference. These are presented and discussed below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.18. Construct Maps for Len's Work-Nonwork Activities Grid

### Commentary on the Construct Maps

The configuration of the constructs in the first map was a good reflection of Len's attitude to work and nonwork activities. The map shows three dyads and two isolates. The isolate at the bottom of the map refers to the construct *strategy – detail*. This appeared to be a primary basis upon which Len construed his work and nonwork activities. When this construct was elicited the element sort was *typing reports, communicate with senior management and professional approach*. The second and third elements were construed as similar in that they reflected strategy. There are two interpretations that can be made of this. *Strategy* can be taken as referring to the higher level aspects of Len's job, particularly since the contrast *detail* was used in reference to the third element *typing reports*. On the other hand *strategy* may have been a reference to Len's career objective which was to progress to higher level management. There was evidence for this second interpretation since the elements *communicate with senior management* and *professional approach* were construed as absolutely career related (the ratings for both were 1.0) on the construct *career related – not career related*.

The second isolate located towards the north-western boundary is the construct *relaxing –time wasting*. There was no obvious connection between this and any other of the constructs. Therefore it stands alone as a qualitative dimension upon which work and nonwork activities were construed.

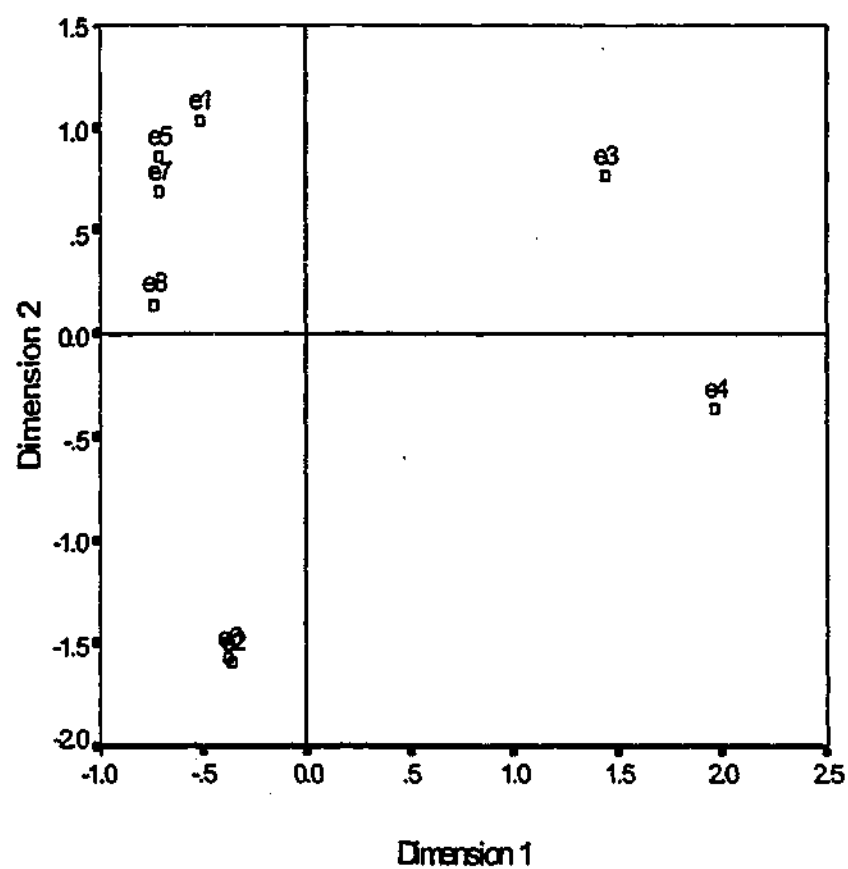
The dyad on the eastern boundary of the map is a logical connection between the constructs *job related – outside work* and *career related – not career related*. Similarly construct two *I like – I don't like* and construct five *satisfaction – not satisfying* are proximate because they are affective. Construct six *I control – no control* and construct

seven *myself – others* are neighbours because, as may be seen in the grid, their ratings were almost identical. The semantics did not immediately suggest any psychological similarity between them. However, construct six *myself – others* can be read as *I control – no control*.

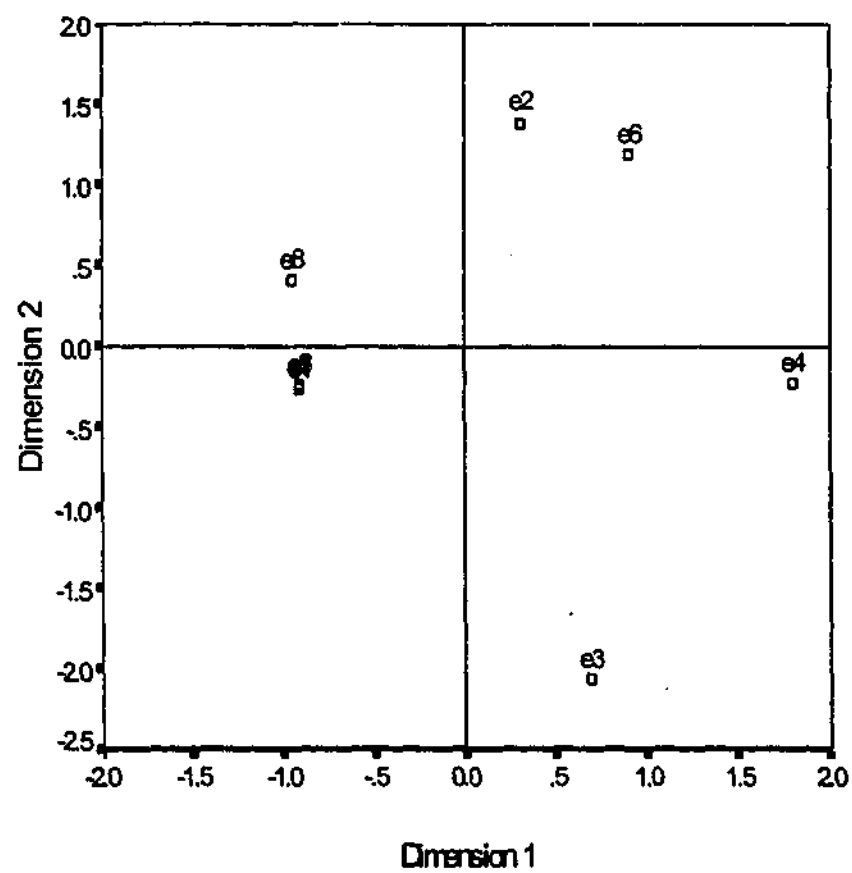
The configuration of constructs in the second map is similar to that shown in the reference configuration. Only minor differences in the contiguity of the constructs were observed such that constructs six and seven were further apart whilst the dyads comprising constructs two and five as well as one and four were tighter.

In summary, the constructs reflected a clear delineation between work and nonwork, Len's career strategy and his strong sense of control over his own affairs. Affect was not a predominant feature of the constructs. The construing of work activities demonstrated a preference for higher level interactions which maximised opportunities for recognition by senior management. The cognitive structure was quite sturdy. No evidence of any change in form was uncovered in the analysis of the second occasion grid. Credence was added to the inference of stability, as the time interval between the interviews was eight months.

The element maps are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.19: Element Maps for Len's Work-Nonwork Activities Grid

### Commentary on the Element Maps

The configuration of elements in the first map shows the differentiation between work and nonwork activities and the activities that Len disliked. Standing in the north-west quadrant is the cluster of elements one, five and seven, *evaluating investment decisions, communicate with senior management* and *a professional approach* respectively. Each of these was directly related to Len's work role and reflected his inclination for higher level interactions. Nearby is element eight, *current affairs*. As mentioned Len indicated an interest in current affairs as a leisure interest but also because knowledge of these was important from the standpoint of his career. Thus, element eight stands in the vicinity of elements one, five and seven.

*Playing golf* and *cooking* (elements two and six) were Len's two favorite leisure pursuits. They are located together in the south-west corner of the map. Standing close together near the eastern boundary are elements three and four *typing reports* and *movies*. Len was quite vocal about these activities which he disliked and construed as a waste of time.

The configuration of elements in the second map was similar to the first. The work related activities are almost indistinguishable from one another indicating Len's consistent focus on his job. Elements two and six are more distant reflecting the lesser opportunities which Len had to pursue after the baby was born. It was deduced that this was not due to an increased workload since at the second interview Len reported a significant reduction in his hours of work from 51-60 hours per week to 41-50 hours per week. Len reported that after the birth of the baby he had to focus more on family based activities. When asked about the changes that had occurred he wrote:



Have had to become a lot more organised as a family. Had to establish clear roles and responsibilities between self and wife. Spending more time together as a family.

The second element map again showed Len's dislike for movies and typing reports. At the second interview he was more acute about his dislike of typing reports. Thus in the second element map this activity is more distant from movies.

In summary the element maps demonstrated Len's clear delineation between work and nonwork activities and those activities which he disliked. An almost identical configuration was observed on the second occasion.

## Len's Work-People Grid

The second grid elicited for Len was the work-people grid. This grid is presented below.

Table 7.38: Len's Work-People Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Higher senior management	0.6	1.0	0.0	1.0	0.6	0.5	0.5	0.8	Senior management*
$\bar{C}_2$ : Personable	1.0	0.6	1.0	0.6	0.0	1.0	1.0	1.0	Not personable
$\bar{C}_3$ : Finance type	1.0	1.0	0.0	1.0	1.0	0.5	1.0	1.0	Human resources
$\bar{C}_4$ : The business	1.0	1.0	0.2	1.0	1.0	0.0	0.7	1.0	Support
$\bar{C}_5$ : High potential	0.7	1.0	0.3	1.0	0.7	0.0	0.3	1.0	Not high potential
$\bar{C}_6$ : Formal power	1.0	1.0	0.5	1.0	1.0	0.0	0.5	1.0	Informal power
$\bar{C}_7$ : Vision	0.8	1.0	0.7	1.0	0.3	0.7	0.3	1.0	No vision
$\bar{C}_8$ : Very experienced	1.0	1.0	1.0	1.0	1.0	0.0	0.2	1.0	Less experienced
Element Types					Nominated People				
$e_1$ : (a person who is important to me)					Trevor				
$e_2$ : (a person who is important to me)					John				
$e_3$ : (a person who I like)					Frank				
$e_4$ : (a person who has my ideal role)					David (Director of Finance)				
$e_5$ : (a person who I dislike)					Rob				
$e_6$ : (a person who I see frequently)					Hazel				
$e_7$ : (a person who I see frequently)					Roger				
$e_8$ : (the most successful person I know)					Ken				

## Commentary on the Grid

There was a significant contrast between this grid and that elicited from Peter about his work colleagues. Whereas Peter's work-people grid was affective in character Len's construing of work colleagues was primarily cognitive. Only a hint of affect can be detected in the construct *personable* – *not personable* in this work-people grid.

Len construed the *finance* function as integral to the operation of the business whilst *human resources* was construed as ancillary. The fourth construct *the business* – *support* showed that Len construed those in the finance area as key players in the

company and those in administration and human resources as fulfilling a support role. Frank (the Human Resources Director) and Hazel (the Office Manager) were construed as having less formal power within the organisation. However, Len remarked that by virtue of her experience and ability within her own functional area Hazel had achieved a significant level of informal power. This is indicated by the rating he awarded her on the sixth construct *formal power – informal power*.

In summary the grid demonstrated that Len had identified those whom he perceived as having influence and ability within the organisation. It amplified further the theme of ambition that was evident in work-nonwork activities grid.

The analytical results for the work-people grids are shown below.

**Table 7.39: FUZZYGRID AND CMDS Results for Len's Work-People Grid**

<i>First Occasion Grid</i>				
Construct Consensus	0.63			
Golden Section Ratio	76:24			
Polarity Ratio	55:11			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.61	0.87	0.98
stress		0.36	0.16	0.05
Element Consensus	0.58			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.72	0.93	0.98
stress		0.41	0.19	0.11
<i>Second Occasion Grid</i>				
Construct Consensus	0.65			
Golden Section Ratio	77:23			
Polarity Ratio				
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.59	0.94	0.97
stress		0.37	0.09	0.05
Element Consensus	0.61			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.73	0.95	0.98
stress		0.36	0.14	0.08

### Commentary on the Results

For the constructs and the elements the magnitude of the consensus coefficients were suggestive of a fairly tight structure. This was also indicated by the CMDS results. For

both occasion data the proportion of variance explained by a unidimensional CMDS solution was significant for the constructs and substantial for the elements. Nevertheless, there were significant gains in terms of an increased r-square and reduced stress for solutions in two dimensions. These were ultimately chosen for interpretation. The Golden Section Ratio again showed Len's predilection for construing on the positive poles. Furthermore on both occasions nearly 60% of the ratings were polarised on the positive poles. This suggested that there may be a significant demarcation between his work colleagues that would be exemplified in the element maps.

The FPWMDS results are shown below.

**Table 7.40: FPWMDS Model Statistics for Len's Work-People Grids**

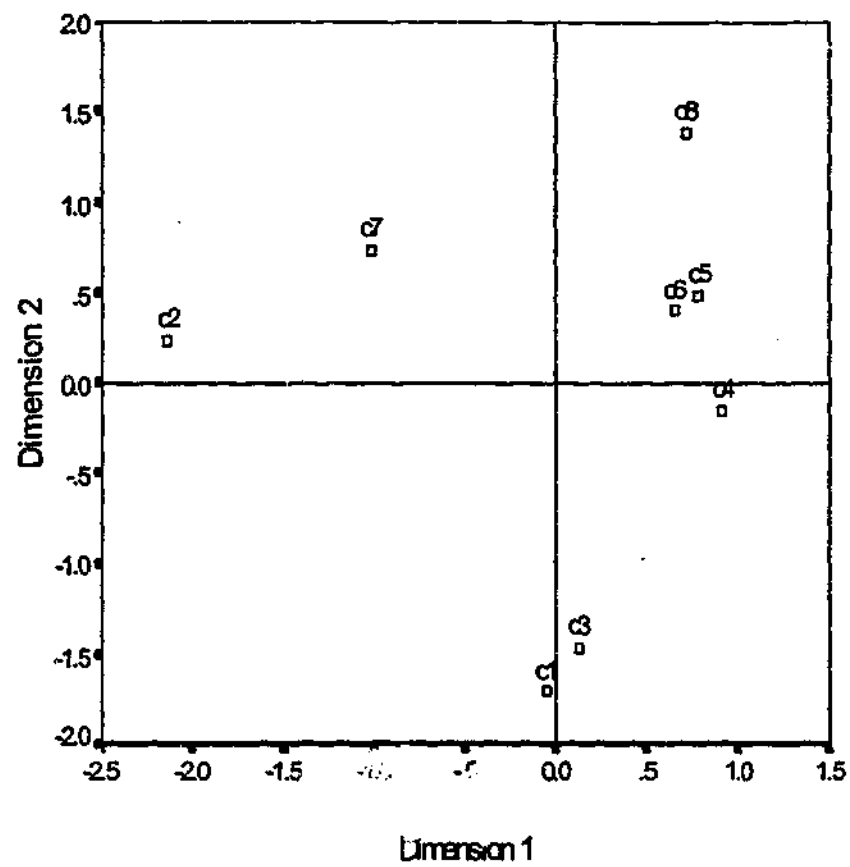
Configurations	R-square <sup>(a)</sup>	Stress	Weight 1	Weight 2
<i>Constructs</i>				
Reference Configuration	0.87	0.13	0.79	0.49
Second Occasion Configuration	0.06	0.41	0.18	0.18
Index of Angular Variation = 0.02				
<i>Elements</i>				
Reference Configuration	0.93	0.19	0.85	0.45
Second Occasion Configuration	0.89	0.20	0.85	0.41
Index of Angular Variation = 0.00				

### **Commentary on the Results**

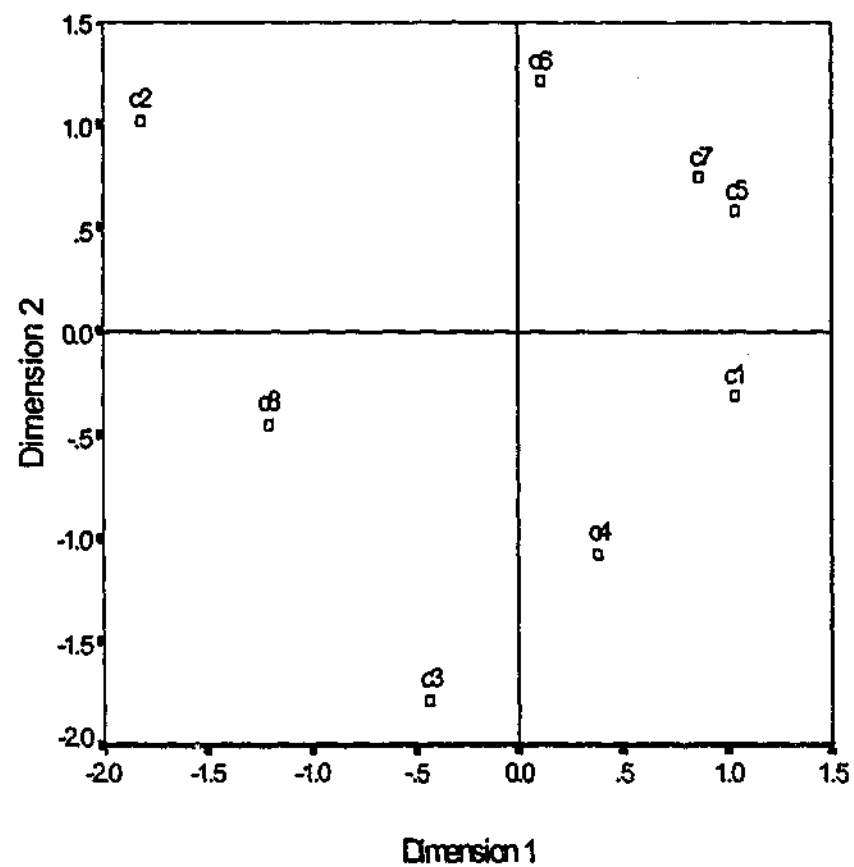
The model statistics for the reference configurations were quite good with high r-square values and reasonably low stress coefficients. For the constructs the index of angular variation suggested a minimal change in the form of the cognitive structure whilst no change was indicated for the elements.

In the course of the current research it was observed that a statistical technique was available to test for *significant* variations in the values of the index of angular variation for significance. The technique called the *Analysis of Angular Variation* (ANAVA) is analogous to the *Analysis of Variance* (ANOVA) procedure. It relies on the calculation of an  $F$  statistic which is the ratio of the mean sum of squares between groups (first and second occasion data in the current research) to the mean sum of squares within groups (first and second occasion data in the current research). Coxon (1982) argued that as with an ordinary ANOVA 'the significance level of the ANAVA  $F$ -test is accurate only when the *observations* (i.e., the subject weights) are independently distributed'. In a standard INDSCAL analysis this assumption is not met since if 'the data for one subject are changed, then the stimulus space will change and the weight for *all* subjects will change' (Coxon 1982, p. 307). The cloning technique used in the current research obviated this problem since the dissimilarity matrices used to generate the reference configuration were replicates, as were those used when comparing the second occasion grid with the first. Thus a further avenue of investigation opened up which if it proved successful would enhance the analysis. However, the use of cloning meant that the within group variance for the first and second occasion data would always be zero. This meant that a *divide by zero* error would arise when trying to calculate the  $F$  ratio. For this reason the technique was not investigated further.

The construct maps for the work-people grid are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.20: Construct Maps for Len's Work-People Grid

### Commentary on the Construct Maps

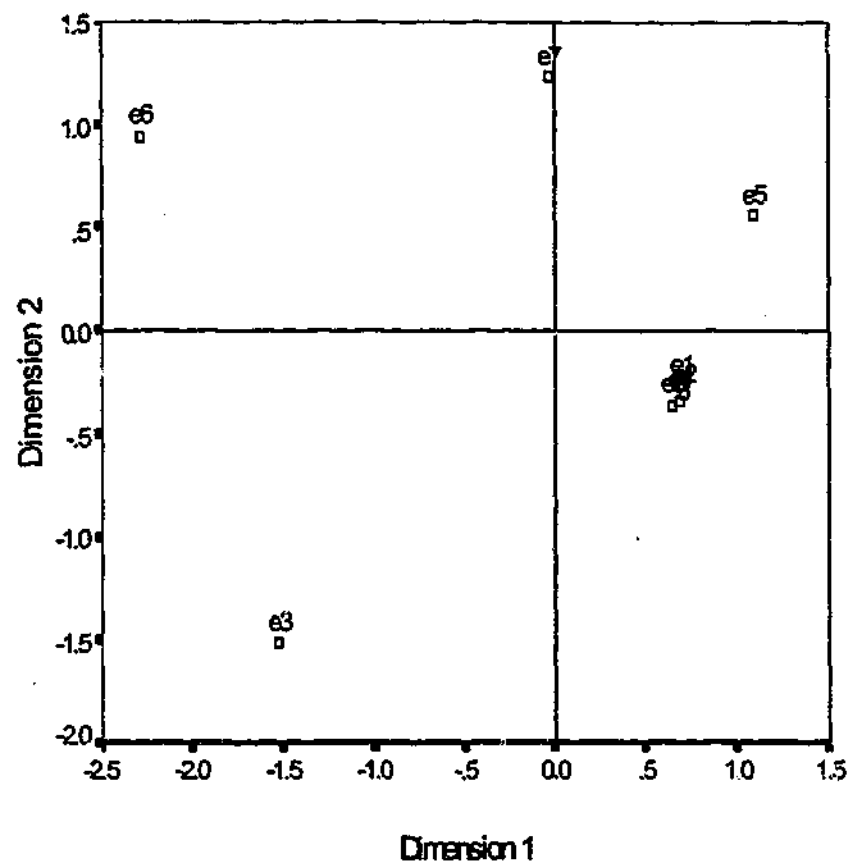
The first map comprises one cluster (constructs four, five, six and eight), one dyad (constructs one and three) and two constructs which are isolated (constructs two and seven). The cluster showed Len's instrumental construing of his work colleagues. Those who were construed as *the business* (construct four) were, with the exception of Roger, also construed as having *high potential* (construct five) and *formal power* (construct six). Again with the exception of Roger they were also construed as *very experienced* (construct eight). The coincidence of constructs one and three *higher senior management* and *finance type* demonstrated Len's construing of the finance function as intimately related to higher senior management positions within the organisation. Constructs two and seven reflected construing of colleagues in terms of how personable they were and their sense of vision. No logical basis for a connection between them could be established. Thus their status as isolates made sense.

The configuration in the second map was somewhat different. Firstly construct eight was relatively isolated. An inspection of the ratings for this construct in the second occasion grid showed that where on the first occasion Len used it as a discriminator between those who were experienced and those who were less so, he construed all of his colleagues as very experienced on the second occasion. This meant the membership values for this construct were 1.0 for each element. No other row in the grid exhibited this pattern. This explains the relative isolation of this construct. Whereas in the first map construct seven *vision - no vision* was not contiguous with any construct, in the second map it is located close to construct five *high potential - not high potential*. This made more sense since vision and potential can easily be related to each other. An examination of the ratings for these constructs in the second occasion grid indicated that Len appeared to treat them as similes. In the first map constructs one and

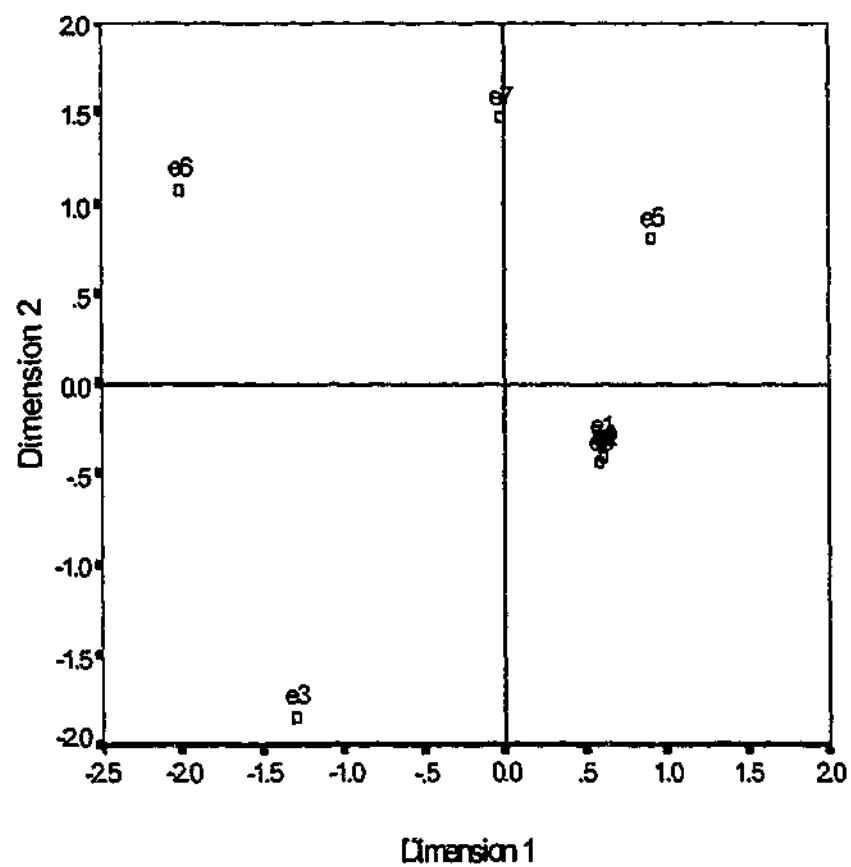
three were connected but relatively isolated from the main cluster. It may be seen that in the second map they are related to construct four *the business – support*. The connection between these two constructs and construct four was not illogical given Len's perception of colleagues. Overall the second map portrayed a similar conception of colleagues to the first.

The element maps are shown below.





First Occasion Reference Configuration



Second Occasion Configuration

Figure 7.21: Element Maps for Len's Work-People Grid

### **Commentary on the Element Maps**

What these maps demonstrate is that although there was some variation in the patterning of constructs the relationship between the elements remained unchanged. Both maps shows a tightly wound cluster which comprises elements one, two, four and eight. These were Len's reference group of higher senior managers, people with potential, vision and formal power. What is most striking about the maps is that they are near replicates of one another. This was reflected by the r-square generated when the second occasion data were fitted to the reference configuration. The value for the reference configuration was 0.93 and for the second occasion data 0.89.

In each map there are four isolates. These are Hazel (e6), Rob (e6) Frank (e3) and Roger (e7). Hazel was construed as having low potential, limited vision and performing a support function. Roger was construed similarly to Hazel but worked in the finance area. Moreover, Len was not as acute about him in terms of his potential and vision as he was about Hazel. Len disliked Rob but liked Frank. These people were construed differently from each other and as fundamentally different to those in Len's reference group. Thus their position as isolates in both maps made sense.

In summary Len did not construe his work colleagues in affective terms. His construing was primarily cognitive and reflected his instrumental orientation. The element maps showed that he had identified people within the organisation who were powerful and of a high calibre. The analysis of the second grid supports the view that Len's intention was to progress either within his own organisation or elsewhere if opportunities were not forthcoming. Identifying those with ability and power within the organisation was germane to that goal.

The third grid elicited from Len is shown below.

### Len's Nonwork-People Grid

The third grid which was elicited from Len related to those people with whom he interacted outside the work environment. This grid is shown below.

Table 7.41: Len's Nonwork-People Grid

Fuzzy Subsets Constructs/Elements	$\tilde{E}_1$	$\tilde{E}_2$	$\tilde{E}_3$	$\tilde{E}_4$	$\tilde{E}_5$	$\tilde{E}_6$	$\tilde{E}_7$	$\tilde{E}_8$	Implicit Poles
$\tilde{C}_1$ : Comfortable	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.8	Uncomfortable
$\tilde{C}_2$ : Responsible	1.0	1.0	1.0	1.0	0.0	0.8	1.0	1.0	Irresponsible
$\tilde{C}_3$ : Fun	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.8	No fun
$\tilde{C}_4$ : Very good friend	0.0	1.0	1.0	0.5	0.5	1.0	1.0	0.5	Family
$\tilde{C}_5$ : Students	0.0	0.0	1.0	0.5	0.0	1.0	1.0	0.5	Not students
$\tilde{C}_6$ : Professional	0.8	0.0	0.9	1.0	0.8	0.8	0.9	0.5	Trade
$\tilde{C}_7$ : Control	0.9	0.8	0.8	0.0	0.5	0.2	0.2	0.9	Influence
$\tilde{C}_8$ : Highest aspiration	0.7	0.4	0.7	1.0	0.7	0.7	0.8	1.0	Lower aspiration
Element Types					Nominated People or Roles				
$e_1$ : (a person who is important to me)					Wife				
$e_2$ : (a person who is important to me)					Paul				
$e_3$ : (a person who I like)					Nick				
$e_4$ : (my ideal self)					My ideal self				
$e_5$ : (a person who I dislike)					Serg				
$e_6$ : (a person who I see frequently)					Ray				
$e_7$ : (a person who I see frequently)					Mick				
$e_8$ : (myself as a father)					Myself as a father				

### Commentary on the Grid

This grid exhibits more affective content than the other two but Len's instrumental orientation is again evident. Constructs one and three are affective reflecting Len's feeling of comfort and sense of fun when in the company of others outside the work environment. Construct two *responsible* – *irresponsible* can be interpreted as an affective expression of Len's instrumental nature. It was the contrast pole of this

affective expression of Len's instrumental nature. It was the contrast pole of this construct that was most informative since it was a reference to Serg who as may be seen was the only person whom Len did hold in high regard. The ratings of him on each of the first three constructs were acute indicating that Len did not feel comfortable with him, construed him as irresponsible and that he was no fun to be with. Instrumentality was again suggested by the eighth construct *highest aspiration – lower aspiration*. This construct mirrors the theme of success and progression evident in the first two grids elicited from Len. It may be seen from the ratings of elements four and eight, that Len set a high bar for himself in respect of his ideal self and his role as a father. Similarly Len construed his wife and friends as having the *highest aspirations* with the exception of Paul who worked as a tradesman and was construed by Len as having *lower aspirations*.

The analytical results for the nonwork-people grids are shown below.

**Table 7.42: FUZZYGRID and CMDS Results for Len's Nonwork-People Grid**

<i>First Occasion Grid</i>				
Construct Consensus	0.59			
Golden Section ratio	71:45			
Polarity Ratio	45:13			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.56	0.92	0.97
stress		0.38	0.16	0.08
Element Consensus	0.61			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.79	0.88	0.96
stress		0.45	0.25	0.11
<i>Second Occasion Grid</i>				
Construct Consensus	0.52			
Golden Section Ratio	66:34			
Polarity Ratio	44:03			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.60	0.84	0.94
stress		0.46	0.21	0.10
Element Consensus	0.54			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.37	0.86	0.99
stress		0.43	0.15	0.04

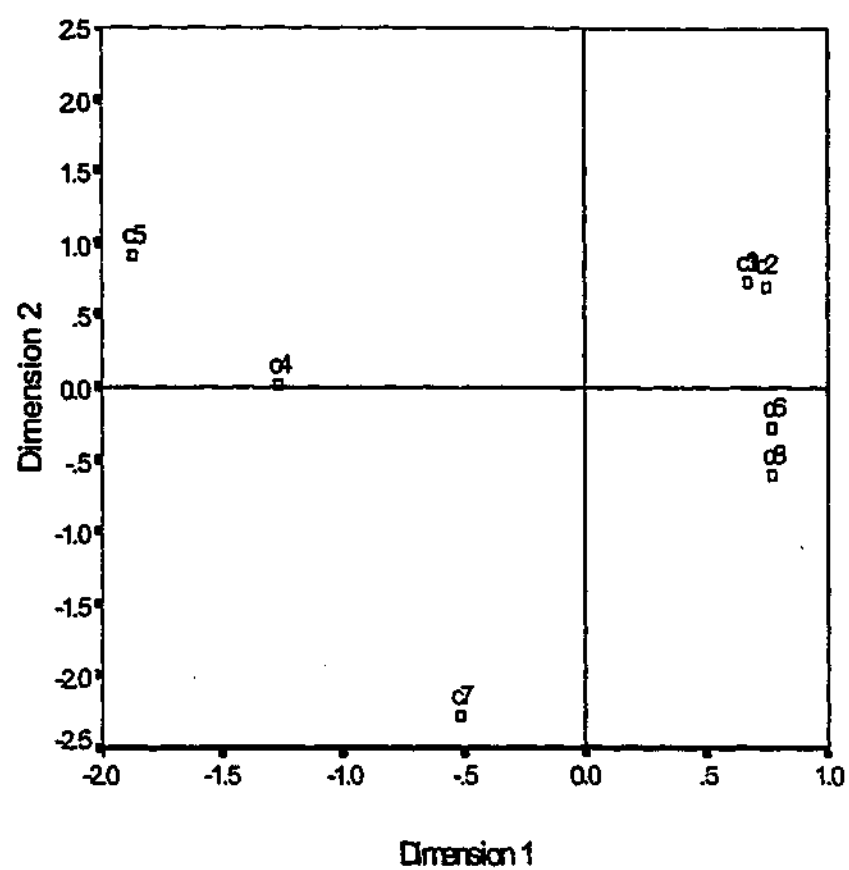
## Commentary on the Results

The consensus coefficients for both grids were of similar magnitudes and quite stable given the time interval between the two interviews. Len's disposition towards positive construing was again evidenced by the Golden Section ratios. He was quite resolute about those in the nonwork world particularly in terms of the affects expressed in constructs one, two and three. For each of these constructs he rated six of the eight elements at 1.0. Thus, positive affects were the main drivers for these constructs in relation to those who had been nominated by him. Based on the CMDS results the FPWMDS was conducted in two dimensions. The results of that analysis are shown below.

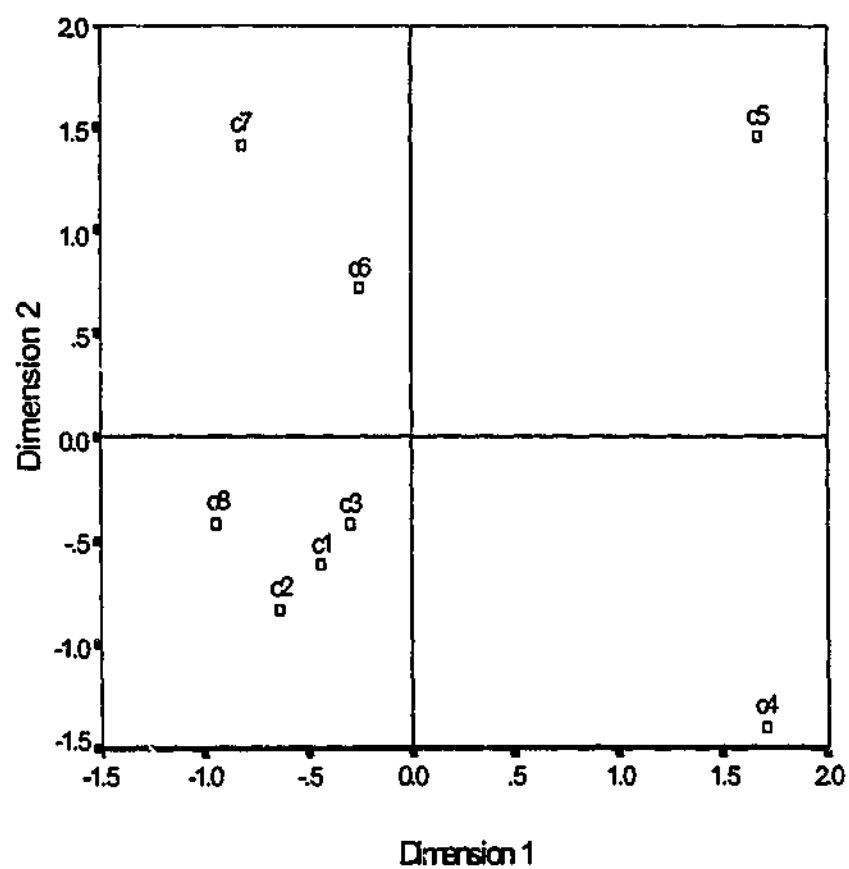
**Table 7.43: FPWMDS Model Statistics for Len's Nonwork-People Grid**

Configurations	R-square	Stress	Weight 1	Weight 2
<i>Constructs</i>				
Reference Configuration	0.91	0.16	0.69	0.66
Second Occasion Configuration	0.65	0.32	0.74	0.32
Index of Angular Variation = 0.02				
<i>Elements</i>				
Reference Configuration	0.89	0.24	0.81	0.47
Second Occasion Configuration	0.20	0.51	0.31	0.31
Index of Angular Variation = 0.24				

The construct maps, which accompany these statistics are shown below.



First Occasion Reference Configuration



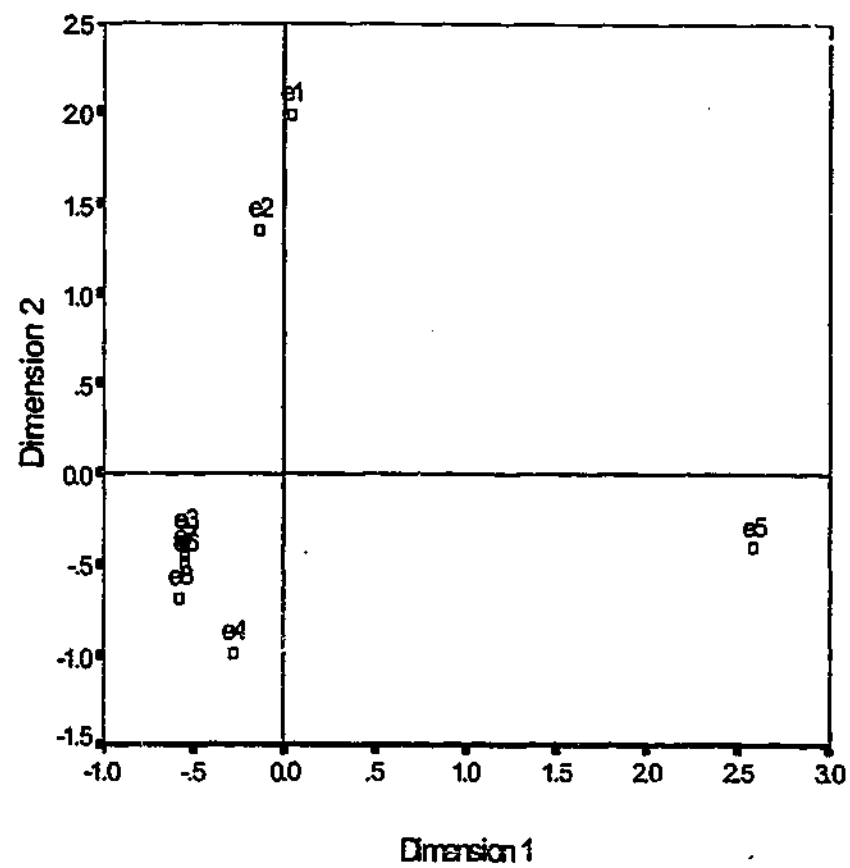
Second Occasion Configuration

Figure 7.22: Construct Maps for Len's Nonwork-People Grid

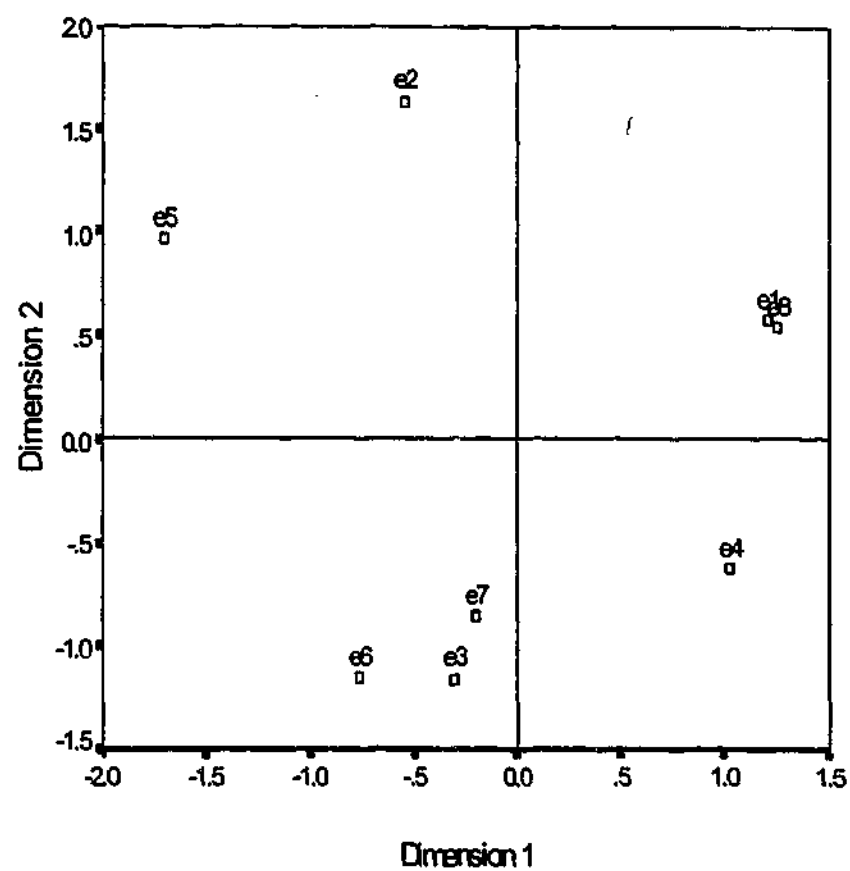
### Commentary on the Construct Maps

Whilst both of the maps show a similar configuration the second is more disparate. Predominant in both maps is one cluster comprising constructs one, two and three, and a dyad comprising constructs six and eight. It may be seen that constructs one, two and three have an affective theme in common such that they indicate how Len felt about those in the nonwork world. Constructs six and eight show that Len's concern with professionalism and his high aspirations also affected the way he viewed his nonwork friends and family. Constructs four and five portrayed nonwork-people in terms of their relationship to Len. The primary distinction here was between friends and family. Construct seven *control – influence* was isolated in both maps since it represented a separate but nonetheless important dimension of Len's character. It was clear from the interactions with him that he was a proactive person. Accompanying this was a strong sense of control over his affairs. The elements that were construed as similar and which resulted in the articulation of the explicit pole *control* were *my ideal self* and *myself as a father*. The element construed as different to these and manifested in the implicit pole *influence* was *my wife*.

The element maps for the first and second nonwork-people grids are shown below.



First Occasion Configuration



Second Occasion Configuration

Figure 7.23: Element Maps for Len's Nonwork-People Grid



### Commentary on the Element Maps

The first map shows one cluster in the south-west quadrant, a dyad in the north-west and an isolate in the south-east. The cluster comprises elements three, six and seven, which represent *Nick*, *Ray* and *Mick*. Each of them was a very close friend of Len's. Also connected to the cluster were elements eight *myself as a father* and four *my ideal self*. It was not unusual to find these two elements inhabiting similar territory in the first occasion element maps. The dyad represents element one Len's *wife* and element two *Paul* who was a very close friend. These people were construed similarly to those in the cluster. However in spatial terms they are isolated from the others. An inspection of the grid revealed that what differentiated them was that they had not been students with Len. The isolate represents *Serg* the person whom Len disliked.

The second element map is more disparate. However in this map *myself as a father* and *wife* are almost indistinguishable. It may be inferred that at the time of the second interview Len had developed a stronger connection between his role as a father and his wife. He had remarked that after the birth of the baby he and his wife were 'spending more time together as a family'. Thus, the stronger connection between Len as a father and his wife makes sense.

At the time of the second interview Len had softened his views on *Serg*. He appeared to be more accepting of him. Therefore, in the second map element five *Serg* is no longer isolated but closely related to Len's very good friend *Paul*. The group of friends from Len's student days remained tightly bunched. Standing relatively isolated in the second element map is the *ideal self*. This tendency for the *ideal self* and *self as father* to become more distant from one another was also observed in other cases.

It suggested the moderation of the idealised role of father following the birth of the baby and the early experience of fatherhood. The difference in the element configuration on the second occasion was reflected in the value of the index of angular variation which was 0.24.

This completes the presentation of the repertory grids for this case. The questionnaire data for Len are presented in the next section.

### Questionnaire Data — Len

#### Work and Nonwork

Work related data for Len are shown below

**Table 7.44: Work Related Data for Len**

Variable	First Interview	Second Interview
Years of work experience	6-10	
Years with current employer	1-2	
Years with previous employer <sup>(a)</sup>	3-5	
Hours of work per week	51-60	41-50
Work at home		
Evenings	No	No
Weekends	No	Yes
Go to work at on weekends	Now and then	Now and then
Job satisfaction	4	4
Occupational satisfaction	4	4
Organisational satisfaction	4	4
Job commitment	4	5
Occupational commitment	3	4
Organisational commitment	4	4

(a) Data reported in the first three rows were collected only at the first interview.

The data show that Len's hours of work were quite high prior to the birth of the baby but that he reduced them considerably by the time of the second interview. At the first interview he reported that he did not work at home at all whereas at the second interview he reported working at home on the weekends.

## Distinguishing Between Work and Nonwork

Len described the similarities between work and nonwork as follows:

I generally plan everything I want to do well in advance. I do not like going into too much detail but prefer to focus on strategy.

Thus the "big picture" approach was a general feature of Len's personality pervading the work and nonwork domains. In relation to nonwork he said that he was not as 'energetic' but more 'laid-back'. Like many of the participants the theme of discretion about the use of time was apparent when Len described leisure as 'something I do that lets me drive the pace and outcome of the activity'.

## Household Work

Len's self reported contributions to domestic work is shown below

Table 7.45: Len's Contributions to Household Work

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	0.00	4.50
Grocery shopping	2.50	2.50
Cleaning	3.00	3.00
Ironing	2.50	3.75
Cooking the evening meal	8.00	10.00
Subscore	16.00	23.75
<i>Traditional Masculine</i>		
Gardening	2.00	1.00
House maintenance	2.00	2.00
Subscore	4.00	3.00
<i>Androgynous</i>		
Budgeting	5.00	3.00
Paying bills	6.00	4.50
Negotiations with external agencies	2.50	2.00
Subscore	13.50	9.50
Total Score <sup>(a)</sup>	33.50	36.25
Satisfaction with division of household work	5	5

(a) The maximum achievable total score was 57.5 made up of the sub-score maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.00 for androgynous tasks.

Relative to the participant group Len's score of 16 for contributions to traditional female tasks was above the mean of twelve on the first occasion and at almost 24 was substantially above the mean of 13 on the second. He reported cooking the evening meal every day in the two weeks preceding the second interview. Len scored of 42 on the AWS scale indicating that he had progressive views about sex roles.

His scores on the masculinity and femininity sub-scales of the PAQ were 27 and 25 respectively. Thus, according to the median split technique he was classified as androgynous. The coincidence of his high score on the AWS scale may explain his relatively high contribution to feminine tasks particularly after the baby was born. However, at the time of the second interview Anne was working 30 to 40 per week. This may also have been a factor affecting his increased contributions. It may also be seen that on the second occasion his overall score in relation to unpaid work had only increased marginally due a reduced contribution in other areas such as *gardening, budgeting, paying bills and negotiating with external agencies*. More responsibility for these tasks may have been transferred to Anne.

### **The Transition to Fatherhood**

#### **Prospective View**

At the first interview Len wrote that he was 'excited' about becoming a father, saw it as 'a challenge that I don't expect to fail in'. He was cognisant of his need to be 'financially secure enough to provide the best education possible' and to spend 'quality time with wife and child'.

Len anticipated that after the baby was born there would be 'less time spent with friends outside the home', that he would 'need to be more conscious of his wife's needs/moods given that she is going to be home for six months alone with the baby'. He anticipated that he and his wife might go through a period of 're-discovering each other'.

Overall Len was well balanced in his approach. He and Anne had planned the baby after taking into account their financial situation. He understood that the birth of the baby would restrict his freedom, require him to make compensations for the difficulties encountered by his wife and that his relationship may be affected by the demands of parenthood.

### Retrospective View

Len was brief in describing the changes to his life after the baby was born. He wrote that he and his wife had to 'become more organised as a family', 'had to establish clear roles and responsibilities between self and wife' and 'spend more time together as a family'. His responses were a marked contrast to those of Peter who was extensive in his comments and more affective in his descriptions of the impact that the birth of his son had on him and his relationships.

### Descriptions of Self as a Father

When Len was asked to describe himself as a father his responses were as shown below.

Table 7.46: Len's Descriptions of Self as a Father

Word/Phrase	Ranking	Rating
Satisfy emotional needs	1	8
Satisfy material needs	2	6
Responsible	3	9
Caring	4	10
Intelligent	5	10
Devoted	5	10
Cope with stress	6	8
Encouraging	7	10

These were a mix of descriptors which were different in character to those reported by Len when describing *himself* and *his ideal self*. The first three portray the sense of responsibility Len felt for the emotional and material needs of his child. It may be noted that the term *provider* was not used explicitly by him but alluded to in the second

descriptor 'satisfy emotional needs'. Moreover Len scored himself as six on 'satisfy material needs' suggesting that *material provision* was a joint responsibility. Intelligence, a quality admired and desired by Len, emerged again as an attribute of the role of father.

### Babycare

Len's reported contributions to babycare are shown below

Table 7.47: Len's Contributions to Babycare

Task	Score <sup>(a)</sup>
Changing nappies	4.50
Bathing	0.00
Night tending	9.00
Play	4.00
Taking the baby for a stroll	3.00
Giving partner time alone	8.00
Total Score	28.50

(a) The maximum achievable score was 50.

Len was one of ten participants who recorded moderate scores in relation to the hands-on role of parenting. It may be seen that he did not report any involvement with bathing in the two weeks prior to the second interview. Given that his wife was working full-time a division of labour appeared to be operating where Anne would bathe the baby whilst Len prepared the evening meal.

## Relationship Issues

### Relationship Characterisation and Salience

Table 7.48: Relationship and Role Salience Data for Len

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	4	5
Friendship	4	4
Partnership	7	6
<i>Ranking of Roles</i>		
Career	1	1
Marriage	2	2
Family life	3	1
Leisure	4	3
<i>Role Salience Subscales<sup>(a)</sup></i>		
Career		49
Marriage		42
Parenting		46
Home		42

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

These results show that partnership dominated the relationship characterisation reported by Len. He and Anne had been married for seven years. Prior to that they had lived together for two years. Thus, the effects of relationship longevity were reflected in the relationship characterisation.

Whilst career was ranked as most salient on both occasions, family life was ranked equally on the second. This equivalence was also suggested by the salience score for parenting which was 46, just below the score of 49 for career. The strongest indicator of Len's attentiveness to family life was the significant reduction in working hours reported by him from 50-60 per week to 40-50 hours per week.

## Marital Satisfaction

Marital satisfaction data reported by Len are shown below.

Table 7.49: Len's Marital Satisfaction Levels and Spouse Relations

Item	First	Second
Miserable/Enjoyable <sup>(a)</sup>	6	5
Hopeful/Discouraging	7	6
Free/Tied Down	7	4
Empty/Full	6	7
Interesting/Boring	7	7
Rewarding/Disappointing	6	7
Doesn't Give Me Much Chance/Brings out the Best in Me	6	6
Lonely/Friendly	6	6
Hard/Easy	5	5
Worthwhile/Useless	7	7
Overall Satisfaction	6	6
Relationship with Spouse <sup>(b)</sup>		9

- (a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.  
(b) The maximum achievable individual score on this subscale was 35.

These results show that Len's level marital satisfaction was high on the first occasion and remained so after the birth of the baby. He did report being more 'tied down' at the second interview. However this was not unexpected nor an unusual response. The minimal score on the spouse relations subscale was indicative of very low relationship stress.



## Parenting Stress and Related Measures

Parenting stress and other perceptions of stress reported by Len are shown below.

**Table 7.50: Parenting Stress Measures for Len**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	7
Child mood	5
Child adaptability	16
<i>Domain Score</i>	28
<i>Parent Characteristics Domain</i>	
Competence	19
Attachment	12
Restrictions	14
Isolation	12
Relationship with spouse	9
Parental health	11
<i>Domain Score</i>	77
Parenting Stress index Score	105

**Table 7.51: Stress Ratings Reported by Len**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	2
Stress as a result of becoming a father	3
Stress from work pressures	3
Relationship stress	3
Overall stress since the birth of the baby	3

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

All of the self-report indicators suggested an easy transition to parenthood for Len. The majority of scores on the sub-scales of the Parenting Stress Index were well below those scores regarded as high, and all of the personal stress indicators reported were low. Thus the overall conclusion was that the birth of the first child had not negatively impacted on Len or on his relationship, and that his progress at work was not impeded. There was no reason to think that Len had exaggerated the ease with which he had handled the transition. The mood during the second interview was one of contentment.

### Summary of Len and Anne's Case

Len was a strong contrast to Peter in a number of respects. Although he and Peter were the same age there was a marked difference in the direction and progression of their careers. Peter's strong Christian beliefs were responsible for the tertiary studies that he undertook. In retrospect he may have made other choices. Unlike Peter who was apparently somewhat frustrated with his career progress, Len had defined clear goals and a definite career trajectory. He had equipped himself well with appropriate education, was continuing to do so, and had managed his professional life carefully.

There was a marked difference in the intensity of the experience of the transition to fatherhood between Peter and Len. This was evident from the content and the extent of the responses provided by them. Peter was obviously moved a great deal by the experience whereas Len, judging by the relative brevity of his responses, was somewhat cooler. As was evidenced by the presentation and the analysis of the repertory grids elicited from Peter and Len, they were markedly different personalities. Peter presented as an affective personality type whereas Len was more cognitive. However, Peter was one of only two participants in the research who vocalised strong feelings about becoming a father. In general the participants were somewhat removed from the experience. A common response was that since they had no physical connection with the baby during the pregnancy and afterwards it was difficult to occupy the role of father in the same way as their partners occupied the role of mother. Many of the participants saw themselves as the support person. Moreover whilst there is a strong culture of motherhood embedded within the social fabric, the culture of fatherhood is only beginning to emerge. Therefore, there appear to be personality and societal factors operating which affect the experience of men during the transition to fatherhood.

In summary, Len was a person who had identified himself as a father and was quite typical of many of the respondents. He did not offer any strong affective descriptions of his experience during the transition but had adjusted his behaviour to the demands of the new role. By his own admission he was very strongly committed to his career and wanted to progress to senior management. He indicated that he saw his career progression as a primary thrust for the family and did not want to be frustrated in this regard. In this respect Len was not typical of most of the participants. For example he was markedly different to David (case number one) who although committed to his job and career minded, was not driven in the same way as Len.

### Conclusion

In technical terms two significant objectives were realised in this chapter. Firstly the case studies presented show how the repertory grid data were used, in conjunction with questionnaire data and observations made at the interviews, to present a view of participants from a number of standpoints. The material available was such that inferences were tested, by appealing to the principle of triangulation. An example of this was the cross-referencing of self-reports of, *Who am I?*, and descriptions of the ideal self provided by respondents with the repertory grid results.

Secondly Peter's case was used to show how a method was derived which could be used to compare the form in the structure of the repertory grids over time. It was argued that in theoretical terms the standard INDSCAL model was deficient since the blending of data can submerge significant differences between subjects (grids in the current research). Support for this proposition was found in the literature and also through contact with people who are eminent in the field of multi-dimensional scaling.

Subsequently a modified method of WMDS was derived and tested. It appeared to be robust when tested on the data collected in the course of the current research. The modified method represents a practical approach to the problem of comparing idiographic data over time. It has a strong theoretical basis and yields indicators that can be compared with graphical output as well as other measures.

In the final chapter of this thesis the theoretical issues discussed in the first part of the thesis are reviewed and the methodological developments that ensued are evaluated. This leads naturally to a discussion of how the methodology developed for the work was tested through empirical research.

**PART THREE – RESUME**

## **CHAPTER 8**

### **CONCLUSIONS AND IMPLICATIONS**

#### **Introduction**

This chapter is a reprise of the thesis in which the aim is to synthesise parts one and two. The chapter is organised in three sections. In the first section the philosophical, theoretical and methodological basis upon which the thesis was established is reviewed and evaluated.

In section 2 the research design that was ultimately used to carry out the field research is evaluated. Conclusions about key issues are presented as is a synthesis of the case studies discussed in the thesis. The specific contributions of the research to the body of knowledge in the field of Personal Construct Psychology are identified, as is the innovation in Multidimensional Scaling Analysis.

The thesis concludes by presenting the implications of the research for government policy and organisational practice. Future research directions are also identified and discussed.

## Reprise of Part One

In chapter 2 a methodological direction based on Kelly's philosophy of *constructive alternativism* was proposed. A rationale for accepting Kelly's theory as a basis for the research approach was achieved firstly by critically reviewing his work and secondly by situating it within a specific interpretation of its ontological and epistemological.

Since Kelly was not known for his attributions to others it was necessary to retrospectively critique and integrate his work with earlier contributions as well as those that were contemporaneous with his. Thus parallels with the work of McDougall (1931) and Bartlett (1932) were uncovered. The closeness of Kelly (1955) and Allport (1937), particularly from the philosophical standpoint, was established. Lewin's (1951) promotion of the subjective frame of reference in concert with the concept of the *life space* was compatible with Kelly's philosophy and also with the specifics of his theory of personality. People behave as *personal scientists* using constructs that are organised in subsystems to understand and negotiate the various contexts in which they live their lives.

Kelly's philosophical position had implications in terms of ontology, epistemology, and human nature. Although Kelly accepted reality as objectively verifiable, he promoted the individual's constructions of that reality as representative of the ontological character of his theory. Closely related to this ontological position was Kelly's epistemological stance. His rejection of behaviourism also constituted a rejection of the impersonal approaches of positivist methods in which the mechanism of stimulus response explicitly negated mediation as a moderating influence on behaviour. The term *negation* is used here since behaviourists recognised mediation but accorded it no status in the

stimulus response equation. By accepting Kelly's theory, this thesis reflected the premise that one can only understand another by occupying her/his frame of reference. Whilst as acknowledged by Kelly (1955, p. 43) one cannot 'crawl into another person's skin' research methods can be devised which maximise the opportunities for individuals to articulate their understanding of the world and also to comment on interpretations made of those understandings by others. This was achieved in this thesis by using a repertory grid design in which elements were not supplied by the researcher but by the participants who subsequently construed among them. Feedback sessions were also conducted after which initial interpretations were reviewed. In summary, the logical connection between the ontological and epistemological character of Kelly's work was to accept human beings as autonomous and free willed. However, following Jahoda (1988) an extreme voluntarism was not assumed.

Given the philosophical basis of the research it would have been incongruous to develop and use research instruments that were incompatible with it. The repertory grid presented as an attractive instrument. From a mathematical point of view it represented a direct expression of the bipolarity and dichotomy corollaries of his theory. It has been used extensively not only as an integral part of approaches incorporating Kelly's theory but also as a stand-alone instrument. However it was not the only method evaluated as a means of eliciting constructs. The self-characterisation method was trialled and evaluated, as was a variant that incorporated the cognitive mapping technique founded on Kelly's theory and developed by Eden (1988). Ultimately a decision was made to use the repertory grid. This required the development and testing of three grids for the field research.



Related to that decision was the need to understand how repertory grids can be analysed such that the cognitive structures that underpin them can be inferred. In chapter 2 it was argued, that the preoccupation in the literature had been with structure as representing only the relationship between constructs, that is with measures of form. However, structure is both form and content. Thus, a task then set for the research was to develop an analytical method that addressed both the form and content of repertory grids. It was also accepted that personal constructs are not restricted to being cognitive in character. They span the triad of meaning that is cognition, affect and conation. Whilst some people have a disposition that is cognitive-instrumental, others are affective-expressive. However, this does not preclude different emphases in different contexts.

In summary, chapter 2 set the ground plan for the research by committing to a philosophical position that found expression in *The Psychology of Personal Constructs* (Kelly, 1955). Subsequently, the fundamental thrust of Kelly's work was accepted and his methodological innovation, the repertory grid, was chosen as the principal investigative tool to be supported by questionnaire data. However it was concluded that Kelly's *Dichotomy Corollary* was not necessary as a support to the *Bipolarity Corollary*. From Kelly's remarks it seemed that the dichotomy corollary was an accommodation to the binary coding schemes used in computers. Moreover, it was unduly restrictive to force a choice between one the other pole of a construct. In terms of rating schemes the effect of the Dichotomy Corollary was to represent constructs as two mutually exclusive sets. This reflected polar construing which has been shown in the literature and in this thesis to occur but not universally as was implied by Kelly's Dichotomy Corollary. This led to an investigation of fuzzy sets as a method for representing constructs.

## Fuzzy-Set Theory

Research was conducted to determine if dichotomous construing could be accommodated within a broader framework. Provision for dichotomous construing was necessary since it was accepted that people do choose use constructs in this way and that some do so more than others. Important insights would be gained from the observance of such construing. Thus, in chapter 3 a theoretical approach was established founded on set theory but also incorporating an extension which recognised sets not as *either or* propositions but as entities in which membership may be graded. From the outset the approach now known as *Fuzzy Set Theory* (Zadeh, 1965) showed considerable promise. By employing the theoretical basis of this theory it was possible to conceptualise personal constructs as *Fuzzy Construct Subsets* whilst maintaining the integrity of Kelly's theory. That is, elements could be rated dichotomously on constructs as in Kelly's original prescription, in which case the membership values were  $\{0,1\}$ , or in intermediate positions in which the membership values were graded on  $[0,1]$ .

Kelly's (1955) notion that personal constructs were bipolar implied that there was a continuity of meaning between the poles. Landfield and Epting (1965) demonstrated that appositness or strict bipolarity such as *good – bad* was not necessarily required for that continuity of meaning to exist. They argued, and it was observed in the current research, that many personal constructs exhibit poles that are *peculiar* to one another but operate in a complementary fashion. Ultimately this meant that usually when undertaking the analysis of grids only membership values related to the explicit poles of constructs were involved. This was a direct application of the complementary rule for fuzzy subsets shown in equation (3.23). It was also shown in chapter 3 that when a participant could not make sense of the poles of an elicited construct that an alternative

procedure was developed such that poles could be separately represented as fuzzy construct subsets without insisting on the articulation of a contrasting pole.

In terms of the structural analysis of grids, the intersection rule for fuzzy construct subsets shown in equation (3.26), was fundamental to the analytical model that was subsequently developed. It was shown that fuzzy construct subsets could be decomposed into *ordinary construct subsets* such that measures of similarity between the construct pairs in a grid could be derived by determining the *degree of inclusion* (a generalised term for intersection) between them. This basis for the measurement of form is similar to methods developed by Jones (1954), Bieri (1955) and Bannister (1960, 1962).

### **The Fuzzy-PCP Model**

In chapter 4 it was shown that interest had arisen in the synergies between Kelly's (1955) work and that of Zadeh (1965). However no research had achieved an expression of those synergies in a working model. Therefore a mathematical model was developed and tested. It was shown by way of test data that the model was capable of producing measures of relatedness for the constructs in a repertory grid. Two types of measure were derived. The first was a global measure of construct similarity and the second a measure of the similarity of construct pairs that was presented as a matrix. Measures of similarity for the elements were also generated, by exploiting the *loose duality* that exists in a repertory grid.

Once the model was developed and tested it became apparent that the matrix manipulations and calculations required that software be created to perform them. Thus, the software FUZZYGRID was written and tested. Subsequently it was used to perform

what became the second part of a four part process for the analysis of the repertory grids.

In summary, part one of this thesis achieved a satisfactory critique of Kelly's work such that his theory and the repertory grid method became the foundations of the methodology used for the empirical research reported in part two. The current research has made a distinct contribution to the theory and method of PCP by addressing what was a weakness in Kelly's work, namely the insistence of dichotomous rating of the elements in a repertory grid. Whilst contemporary work had moved away from this, such that interval level ratings grids were the norm, the attractive and viable connection between PCP, Set Theory and more importantly Fuzzy Set Theory had not been realised. Thus, the contribution made in part one, was to demonstrate the strong theoretical basis for representing personal constructs as *fuzzy construct subsets* and similarly the elements as *fuzzy element subsets*. The mathematical model that was formulated to extract relatedness measures from those representations was a new addition to the methodologies available in PCP. The current research moved beyond reliance on single measure of form such as matching scores and correlation coefficients. Subsequently the analytical method was extended to generate graphical representations of form by using multidimensional scaling analysis. The research question which was :

***to investigate how men construe both work and nonwork as well as their behaviour in those domains during the transition to fatherhood.***

provided a forum in which to test the model using real world data. This was the focus of part two of the thesis, which is reviewed in the next section.

## **Reprise of Part Two**

Part two opened by presenting the research design used for the field work. This was the substance of chapter 5. It was shown that a number of criteria were used to qualify volunteers for participation in the research. Specifically the intention was to recruit a sample of couples that were indicative of the trend in family formation with respect to age and occupational status. Thus couples in which both partners were professionals and in the age range twenty-eight to thirty-five were the target population. However, in order to introduce a measure of contrast, non-professionals were also recruited for the study,

Reflecting the trend towards cohabitation as a common form of relationship, it was not mandatory that couples selected for participation in the study were married. However, it was noted that for the two cohabiting couples who participated in the study one relationship had a character more akin to marriage, whereas the other appeared to be part of a statement about a desire to be liberated and nonconforming. In respect of the latter some concern arose about the couple relationship after the baby was born. It could not be determined whether or not the cohabiting status was indicative of a concern about a formal commitment.

All of the couples were expecting their first child. Although the focus of the current research was on the experience of the men during the transition to fatherhood, it would have been preferable to have also secured direct reports from their partners. However this was prohibited because of ethical concerns. There was no underlying suspicion about how truthful the men would be. However, the female perspective would have

added significantly to the research, particularly because the female experience is in many ways different from the male. The female carries the baby, endures the birthing process, and as was observed in the current research withdraws at least temporarily from paid work. Insights from these perspectives would have provided a contrast to the male experience that is the inverse. In contrast a number of participants reported that they felt remote from the birth experience. Moreover, the character of their lives was fundamentally unchanged in relation to the continuity of their paid work.

As was shown in the description of the instruments, the repertory grids and the questionnaires were designed to span the work and nonwork domains. The questionnaire data included details of working hours, relationship issues and indicators of the stress associated with the transition to fatherhood. When the analysis of this material was amalgamated with the repertory grids, significant portraits of the individuals were produced.

### **Conclusions about Key Issues**

#### **Aggregate Results**

In addition to reporting nine individual case studies questionnaire data were reported at the level of the participant group which across both studies comprised 22 couples. It was not intended that the current exhibit, the character of a large-scale nomothetic study. However, the current research addressed issues that relate to the debate about the work-family interface and workforce diversity. Thus, it would have been remiss not to canvass a number of prominent issues in relation to organisational practice as well as from the research point of view.

The implications behind using a small non-random sample were recognised and accepted. However, two important outcomes were achieved by carrying out the analysis of the data at the aggregate level. Firstly, an understanding of the character of the participant group was achieved. The similarities and the differences between the participants began to emerge, such that the selection of cases, which were written up in detail reflected those similarities and differences. Secondly, the results of the aggregate analysis provided a basis for the design and execution of future large-scale studies.

*Age at first marriage and parenthood.* The participant group reflected the trend towards marriage at a later age and delayed parenthood. It was found that female partners were usually younger and that this difference was not affected by occupational status. However, it was also found that there was a significant difference in the mean age at first marriage according to occupation, such that professionals were observed to marry later than non-professionals.

*Cohabitation and Marriage.* Whilst sixty per cent of the participant couples had cohabited prior to marriage, the duration of that cohabitation was short. There was support for cohabitation as a form of modern "live in" engagement. Only two of the participant couples were unmarried. Thus, as has been reported in the statistics, there remains a strong preference for the institution of marriage. Whilst there was some indication of 'marrying up' in the current research, the educational level of achievement of the participant couples was in general quite high.

*Paid and Unpaid Work.* The paid working hours of the men in the participant group were largely unaffected by the birth of their child. In contrast, all but six of the women withdrew from the paid workforce and had not returned when the second interview was

conducted. Of those who returned to paid work, three were working twenty hours to thirty hours and three were working thirty to forty hours per week.

It was found that in relation to unpaid work the division of household labour mirrored what has been extensively reported in the research. Men generally perform little of the work that is classified as traditional-feminine, have almost full responsibility for those tasks classified as traditional-masculine, and also assume a good deal of responsibility for tasks such as budgeting, paying bills and negotiating with banks and other external agencies. When the data were analysed in relation to the workforce status of partners it was found that the contributions of participants to household work which was traditional-feminine was unaffected by this. The contribution of participants was low even when their partners were working full-time. Similarly no significant differences were detected in respect of the contributions made by those typed as androgynous and those typed as masculine.

Barnett and Baruch (1987, p. 30) argued that the participation of men in household labour and childcare may be inhibited by traditional sex role attitudes held by the partner/wife. In such cases women may act as "gate keepers" and impede the contributions of men to family work. Whilst this argument has some substance the sample of couples interviewed for the current research were primarily well educated professionals. They were expected to and indeed the men did in general exhibit progressive attitudes towards women. However, there was no translation of those attitudes into significant contributions to traditional repetitive tasks. Reporting on theoretical perspectives Kluwer, Hessink and Van De Vliert (1997, p. 635) argued that contributions to household labour may be explained by the exchange argument where the partner who is the breadwinner exchanges income and perhaps prestige for



domestic labour. This argument has some merit particularly during the period of family formation but it fails to explain the continuance of the responsibility for household work and childcare even when both partners are working. It may be that the exchange theory is not an independent notion but a vehicle for the expression of traditional sex role attitudes.

In the current research further investigations in respect of household work could not be made because data were not available from partners. Again this was because of the ethical constraints placed on the research. This constraint also arose in connection with other self-report items connected with marital satisfaction, relationship characterisation and relationship and parenting stress. It was the most significant limitation of the current research. It was imposed and accepted because of the judgement made by others about the stresses, which might be imposed on couples by the research, at a time when there was potential for significant stress to develop in the couple relationship. Returning to the issue of unpaid work there was no reason to doubt the reports of the participants as they reflected what was gleaned from the research literature.

*Sex Role Types and the Transition to Fatherhood.* The current research found that not all those typed as masculine were fundamentally instrumental in their orientation. Of the six participants who were typed as such, only two expressed strong instrumental characteristics when asked to respond to *Who am I?* In contrast the person typed as feminine was clearly expressive. Among the six participants typed as androgynous only one was clearly instrumental in terms of self-reports made.

It was found that the provider role did not dominate descriptions of self as father. There was an emphasis on the importance of the expressive dimensions of the role as

indicated by the salience of expressive descriptors. This was consistent with recent research outcomes reported by Edgar (1997).

*Relationship Issues.* It was anticipated that the partnership aspect of relationships would become more salient after the birth of the baby. This was observed for the participant group and for the masculine subgroup. However, no increase in the significance of this dimension was observed for the androgynous subgroup. A rationale for this was that androgynous types made greater contributions across a number of areas such that their relationships are stronger in terms of the partnership dimension.

For example, those typed as androgynous made greater contributions to babycare than those typed as masculine. However, no conclusive comments can be made here because of the small size of the androgynous subgroup, and because the results in respect of contributions to feminine tasks and babycare for that group were inconsistent.

For the participant group and for the subgroups typed masculine and androgynous parenting and marriage emerged as the most salient roles. Whilst a decline in marital satisfaction was observed in the post-natal period this decline was more pronounced for the masculine subgroup. However, in respect of both subgroups the level of marital satisfaction reported was high on both occasions, the mean on both occasions being in the vicinity of six on a seven-point scale.

For the participant group as well as for the masculine and androgynous subgroups the transition to fatherhood was not a source of severe stress. This finding was made after assessing self-reports of parenting stress, the difficulty of the transition and stress arising from enacting the role of father, work pressures and relationship issues.

Participants also reported a measure of general stress after the birth of their baby. The results, which were consistent across all of these indicators, were that moderate stress levels were experienced. They were in keeping with a theoretical expectation of elevated stress levels after a major transition in the life style.

In summary the pattern that emerged was of a participant group which was fairly homogeneous and indicative of some current trends. As a whole the group reflected the trend towards late marriage and delayed parenthood. Cohabitation is a common form of pre-marriage experience. The usual arrangement appears to be that following the birth of the first child women withdraw from the paid workforce for an extended period. In this study 16 of the women withdrew from paid work for an extended period. Only six had returned to work at the time of the second round interviews, which were conducted more than six months after the birth of the baby. Reflecting the long-term and apparently unchanging trend the men who participated in the research expressed a low preference for household work that is feminine in character. This preference was more pronounced among those who were typed as masculine. The contributions to baby care were more significant among those that were typed as androgynous. However, the basis of this demarcation was a benchmark that was set by the researcher. Thus it was a subjective estimation of what constituted a "significant" contribution. In terms of stress the transition to fatherhood did not appear to result in serious ructions. Again a limitation here is that reliance was placed on the self-reports of participants. It is questionable that these would have always reflected the perceptions of their partners.

## The Case Studies

Chapter 6 provided an opportunity to achieve three objectives.

The first was to demonstrate how the questionnaire data were analysed at the level of the individual such that a detailed impression of the personality and the experience of individual participants was achieved. Related to that objective was the need to demonstrate the differences in personalities and the varied experience of individuals during the transition to fatherhood.

The second objective was to demonstrate how the repertory grids were developed and trialled such that by the conclusion of the first study a satisfactory process for construct elicitation had been designed for execution in the main study.

The third objective was to demonstrate how the third component of a four part analytical process was achieved by using the results generated by FUZZYGRID for Multidimensional Scaling Analysis. That analysis rendered graphical output of construct and element scaling maps feasible and yielded model statistics that could be used to assess the quality of results.

Each of the cases was demonstrative of the variety of men who participated in the research.

**Stephen.** Stephen, an engineer, was by all accounts intelligent, well educated and a hard worker. Despite his professional status and very long working hours he had not

achieved a managerial position. However he did not appear to be strongly motivated by career success. He was a reflective, caring person whose principal focus was on his marriage and family life. The fabric of his family life was traditional, in that his wife Emma assumed almost total responsibility for the feminine, tasks except cooking. It may have been that Stephen's contributions were more significant when Emma was working but this could not be determined as she was not in paid work at either interview.

Stephen was sensitive to the changes that had occurred after the birth of the baby and had modified his thinking and behaviour accordingly. His sensitivity to others was indicated when he described the most salient aspect of his role as a father as 'providing comfort'. It was noted that in respect of all areas of baby care he reported very high contributions. The dominant components of his relationship characterisation on both occasions were friendship and partnership with the former being slightly more salient on the second occasion.

Whilst he reported the transition to fatherhood as easy he also reported considerable stress as a result of enacting the role. Based on his reports and observations made at the second interview, this was attributed to difficulties in managing the baby because of its temperament and Stephen's perception of his low level of competence in looking after an infant.

Stephen's life was one of stability and routine, where ambition was secondary to his focus on family life and marriage. Despite some stress after the birth of the baby, he had managed the transition well in terms of moderating his work commitments and managing his relationship and family life.

*Tim.* Tim's experience of the transition to fatherhood was more problematic than Stephen's. During the course of the interviews with him, a number of indicators emerged that individually may not have caused much concern, but in the aggregate amounted to a difficult time for Tim. From responses given by him at the first interview it was apparent that his work life had been varied and perhaps unstable. Unlike Stephen he had not undertaken any tertiary education and this was also a contrast to his wife Evette who seemed to be more dynamic than he. At both interviews there was a sense that the gap in levels of educational and professional achievement as well as a difference in clarity of career goals between Tim and Evette had the potential to cause friction in the relationship. However this was not indicated by any of the measures concerned with relationship issues. At the first interview an allusion to a marriage because of Evette's pregnancy was a cause of concern, as was the influence of her family whose culture was hallmarked by family cohesion and strict codes of conduct. Tim's cultural background was different, but more importantly his experience of family life had not been positive. He described his own family as involving members who were distant from one another. A strong feeling after the first interview was that Tim's perspective on fatherhood was extreme in its optimism and that he may encounter difficulties by attempting to be too much like the ideal father. This was manifested at the second interview by an introspective and negative description of the changes that had occurred since the baby was born and by self-reports of high stress associated with the transition to fatherhood and the experience of the role. At the conclusion of the second interview there was a concern about future developments.

*Victor.* In terms of the participants Victor and his wife Jenny may be classified as *accommodators*. It was apparent that the accommodation of Victor's wants by Jenny was an important factor in maintaining a satisfactory relationship. Victor was one of

three participants who, in terms of career focus, was extremely intense. He had clarified his long-term goals and was working hard as well as attaining specialist qualifications so that they would be realised. He was promoted to what was a substantial managerial position between the first and second interview. Despite this change, and other demands, which apart from his studies included triathlon training, there was no sense from Victor or Jenny that parenting posed any significant problems for them. They had planned to have only one child and were resolute about that decision. For them the birth of their child was a gratifying experience and the direction for the trio had been set.

**William.** Like Victor, William had a frenetic life. This was evidenced by his self-reports of very long working hours and his efforts to renovate a Victorian house in inner Melbourne. From this standpoint Victor and William were alike. However, they were fundamentally different personalities. This was evidenced by their self and ideal self descriptions which in the case of Victor were more instrumental. Unlike Jenny, William's partner Anna returned to full-time work within nine months of the baby's birth. The single most important factor affecting the quality of the family experience after Anna returned to work, was the support offered by her mother in caring for the baby during the day. It was clear from descriptions by William of his mother-in-law that he held her in extremely high regard. The sense of communion with her that he indicated at the first interview was not diminished when the second interview was conducted. William and Anna's child was clearly well-adjusted and outgoing.

### **Integration of the Repertory Grids**

Although under Kelly's (1955) scheme Repertory Grids have a standard design the configuration of elements and the process of elicitation is experiential. Thus, the grids that were ultimately used for the current research were designed, trialled and modified

during the pilot study. William agreed to participate in a trial elicitation. Following a review of that process and the outcomes, the final design and method of elicitation was devised. As was shown three grids were designed to span both people and activities in the work and nonwork domains. Apart from the new procedures implemented to reflect the interpretation of constructs as fuzzy subsets, a new form was designed and ellipses produced to assist in the elicitation process. The most important realisation was that grids should be carefully designed to suit the purpose of the investigation, and the elicitation procedure mastered before serious work could begin.

The last case reported in Chapter 6 demonstrated the way in which data emanating from a repertory grid were subsequently analysed by FUZZYGRID, the results of which were used to test a multidimensional scaling method for further data resolution. This is summarised below.

*David.* David was the most intense of all the participants in the research. Part of that intensity arose from his strong intellectual capacities. The grid elicited from him about his work and nonwork activities suggested that he had a high level of intolerance for those things that he regarded as mundane. The magnitude of the consensus coefficient for the constructs (0.80) pointed to a simple structure. However, in David's case this did not mean simple in the intellectual sense but reflected his intolerance.

The challenge posed in the research was to determine if the inferences made on the basis of the magnitude of consensus coefficients could be tested by using another analytical technique. It was in response to this challenge that further research was undertaken, and that subsequently multidimensional scaling techniques were used not



only for the third component of the four part analytical method but also for the fourth part that was developed, tested and implemented in Chapter 8 of this thesis.

In reporting David's case it was shown how the dissimilarity matrices produced by FUZZYGRID could be exported to SPSS and that scaling maps and statistics could be reproduced with model statistics that could be related to FUZZYGRID output. Thus, the high construct consensus coefficient translated into a one-dimensional scaling map in which David's underlying *like-dislike* discrimination of work and nonwork activities was shown to be dominant.

During the conduct of the current research it was deduced that by virtue of its matrix structure the Repertory Grid can be interpreted in terms of the columns as well as the rows. Such an interpretation is similar to solutions in linear programming which can be interpreted as the *dual* instead of or as well as the *primal*. In optimisation problems the dual is fully recoverable from the primal solution. However, this is not expected in Repertory Grids presented as fuzzy ensembles (rows as fuzzy construct subsets and columns as fuzzy element subsets) except in the case where all the cells have unit entries. Nor is expected when grids are rated and analysed in the traditional manner with rating or ranking scales. Thus, in the current research the dual relationship between the rows and columns in fuzzy repertory grids was distinguished by classifying it as a *loose duality*. The element map produced for David's work nonwork activities grid demonstrated how this other view of the grids enhanced the interpretation of solutions. In his case it showed his clear preference for things intellectual both at work and outside work.

## **Change and Stability in the Form of Cognitive Structures**

When the task of writing up the cases for the main study was begun, all but one of the problems concerned with the analysis of grids had been overcome. That problem was to resolve a method to assess the change or stability in the form of cognitive structures over time. An easy solution would have been to compare the consensus coefficients for the constructs as well as the elements, and on the basis of the similarities or the differences speculate about changes if any. An alternative would have been to correlate elements in the first and second occasion dissimilarity matrices for the constructs and the elements, and use a benchmark correlation of 0.70 as indicative of a stable form in the cognitive structure and element configuration. This would have reflected standard approaches reported in the literature.

From a statistical point of view it was felt that the correlation coefficients were limited by compensating effects which could occur in the similarity and dissimilarity matrices. Thus, the correlation coefficients may not have been reliable indicators. This option was not pursued.

However, more important than either of the two options mentioned, was the strong potential for applying multidimensional scaling techniques to longitudinal data. In this regard two significant problems were solved. The first was that a problem with the INDSCAL scaling model was identified such that when two or more matrices are compared, a blending of data occurs that pollutes results. The second problem was how to use the INDSCAL technique to evaluate individual cases over time. Certainly it was possible to compare a set of responses from a large group of people at one point in time with the responses of that same group at another point in time by using the FIXED (CON) option available in SPSS. However this did not cater for the single case.

Moreover, it also suffered from the blending problem identified above. Both the blending problem and the problem of the single case were overcome by *cloning* matrices for each occasion data.

Subsequently a dissimilarity matrix for a first occasion grid was cloned and the resulting configuration used as a reference configuration for a set of cloned dissimilarity matrices arising from the same repertory grid which was rated again on a second occasion. It was proven both logically and mathematically that whilst blending occurred with the cloned matrices it was not problematic precisely because the matrices were cloned. Moreover, data that were collected at two distinct time points were analysed in a manner that recognised this. One program was run to produce the reference configuration and another to produce the second occasion configuration in relation to the reference configuration.

Once this problem of comparability over time was solved, research was undertaken to determine if an index measure could be derived on the basis of the results emanating from that analysis. In terms of geometry the fundamental interpretative approach for the INDSCAL model is to compare the direction of subject vectors such that vectors which point in exactly the same direction will have zero angular (not Euclidean) distance between them. An index called the *Index of Angular Variation* was subsequently used as an indicator of change or stability in the form of cognitive structures. It was observed that this index was somewhat insensitive to variations in the direction of vectors. However, this limitation was accepted because of the availability of indicators such as the Consensus Coefficients for constructs and elements, the Golden Section Ratio and the Polarity Ratio, all of which were used conjointly when evaluating results. Again by recognising the dual nature of the repertory grid the index of angular variation was also

employed to evaluate variations in element configurations over time. This work which represented the culmination of the methodological developments of the research was presented in the first case written up for the main study and presented in chapter 7. That case is summarised below as are the others written up for the main study.

**Peter.** Peter was employed as a factory hand, a job that was ill-suited to his intellectual capacities. Whilst he had taken a degree, the area of study which was theology did not provide him with the knowledge and skills necessary for professional employment. Peter admired entrepreneurs and wanted to be one but was also very strong in his religious convictions. Those convictions appeared to transcend all areas of his life and were particularly pronounced in his private life. They strongly affected his perception of the father's role. Peter was notable among the participants because of the clarity with which he articulated his idea of fathering, and by the obvious commitment that he had made to the role, well before the baby was born. In other respects he was quite similar to the other participants. The household division of labour fell along traditional lines before and after the birth of the baby, despite the fact that his wife was working full-time on the first occasion and part-time on the second. Peter's construing was more affective than cognitive and on the second occasion there was a marked change in attitude detected, such that he displayed strong negative affects towards his work colleagues. Apart from that he seemed happy with the other aspects of his life and particularly with his role as a father.

**Len.** In terms of the cases presented here Len was most like Victor in that he articulated a very strong and focused career orientation. He had achieved one masters' degree and was about to enrol for another when the second interview was conducted. He was politically astute and had used this capacity to identify those within the organisation for

which he worked who were most powerful. Len was not given to affective construing but there was a sense from him that he was positively disposed to those who, like him, had high aspirations, and were high achievers. This was evidenced by the way he construed colleagues at work and others in the nonwork domain. Intelligence and achievement were the hallmarks of his approach to all things including his role as a father. In connection with fathering he was typical of many respondents and did not offer any strongly affective or elaborate descriptions of the changes which becoming a father had made in his life. However he had reduced his working hours and made a contribution to the household by cooking the evening meal on most evenings after the baby was born. On both occasions his wife was engaged in full-time paid work. Given this, his overall contribution to unpaid work was relatively low. In contrast his reported contributions to babycare were significant. From the various stress scores reported by Len the transition to fatherhood was an easy one.

*John.* John was the oldest participant in the research. Whilst his age was one factor that contrasted him with the other participants, his personality was characteristically different to every other participant. John expressed no ambition about career progression. Whilst this may have been a function of his age, it appeared to be more strongly related to his disposition, which was an expressive one focused on helping others. His profession as a teacher allowed him to express his caring nature and it seemed that becoming a father was also an avenue for him to express this. His enthusiasm for fatherhood was magnified by the untimely death of both of his parents. John's only one other living relative was his sister.

John was also self-effacing to the extent that he was very appreciative of the opportunity to marry. Prior to meeting Loretta he had an expectation that he would

never marry. John and Loretta were a devoted couple who had directed all of their efforts at impending parenthood. Loretta had resigned a senior position and expressed no desire to return to work. From the self-reports provided by John, the extent of his contribution to caring for the baby was such that it appeared to have caused him stress. He appeared to be trying too hard to fulfil the role. There were indications that he felt somewhat inadequate about his competence but also that the baby was difficult to manage. After the interviews were conducted a number of efforts were made to contact John to clarify these issues. Those attempts were not successful and for ethical reasons no further efforts were made. However it was discovered that he and Loretta had had another child. This indicated that what seemed like significant difficulties had been surmounted.

**Glen.** Like John, Glen was an expressive person, but more gregarious and outgoing. He loved to converse and was clearly at ease in the company of others. His work at a casino suited his open style. Like Tim, Glen had not achieved tertiary qualifications and there were indications from his work history that he may face future difficulties in the labour market. The only significant stress that Glen reported on the second occasion was stress from work pressures. At the time of the second interview he had just commenced work in a new position. He and his wife Rona were traditional in the sense that she did not plan to return to work after the birth of the baby. Both of them were close to their families and Glen was particularly close to his parents-in-law. He and Rona lived with them prior to the birth of the baby. Glen reported an easy transition to fatherhood and little stress in the role.

The case studies that were written up achieved three objectives. Firstly they presented detailed accounts of the experience of men during a major life transition. Secondly the

cases were contrasting such that the men were different in age career orientation and stage and sex role orientation. Thirdly, the first four cases demonstrated how the questionnaire data were ultimately assembled so that a logical sequence of presentation could be achieved. The last case presented in chapter 6 acted as a bridge such that when chapter 7 was written both repertory grid data and questionnaire data were combined to present a composite picture of each participant.

### **The Contributions of the Research**

#### **Contributions to the Theory and Methods of PCP**

This research has added to the body of knowledge concerning the theory and methods of PCP. The FUZZY-PCP model, which is based on the representation of repertory grids as fuzzy entities has been formulated and tested. The model has been incorporated in software named FUZZYGRID. Case studies have been presented which demonstrate that the research moved from theory to practice and that meaningful results can be produced. Specific contributions to PCP are set down in Table 8.1 below.

**Table 8.1: Contributions of the Research to the Theory and Methods of PCP**

Aspect of Theory/Method	Comment	Contribution of the Research
Personal constructs are bipolar dimensions.	They are but the poles are often not apposite but peculiar.	Two new procedures have been recommended to address the question of relevance in connection with construct poles. In cases where the first procedure uncovers a construct whose pole are nonsensical the construct can be eliminated or split such that poles can be rated individually if desired.
Personal constructs are dichotomous.	They may be but they are not generally so.	Treat constructs as fuzzy construct subsets whose membership values are graded on the interval [0,1]. Thus, dichotomous construing is accommodated but not mandated.
The analysis of interval level ratings assumes no latitude in ratings.	True, but it is possible to make allowances for this.	Decomposition is used to create $\alpha$ - level sets from the fuzzy construct subsets and the fuzzy element subsets. Similarity is measured by using $\alpha$ - level sets to estimate the degree of inclusion for the constructs and also for the elements.
Repertory grids are matrices which exhibit duality.	The duality in repertory grids is a loose duality.	The FUZZY-PCP model incorporates loose duality as does the FUZZYGRID software.
Cognitive structure is about form.	This is reasonable given the emphasis on structure as <i>form</i> in the literature.	Cognitive structure is form and content. Grids were analysed in terms of form and content.
The form of a cognitive structure is indicated by the degree of relatedness between the constructs as measured by a correlation coefficient or a matching score.	Usually but it is desirable to have more than one measure as an indicator of form.	Output generated by FUZZYGRID was used with SPSS to generate Multidimensional Scaling Models as representations of the form underlying constructs, and also element configurations.
The Golden Section Ratio is an indicant of lopsided construing.	True, the ratio can differentiate construing that is unduly negative or positive.	Develop a Golden Section Ratio based not on dichotomous ratings but on ratings that are membership values of fuzzy construct subsets.
Polar Construing may be an indicator of dysfunction.	Correct.	A Polarity Ratio was developed which indicates explicitly the proportion of ratings on the positive and the negative poles, that is, the proportion of {0,1} ratings.

### Contribution to Multidimensional Scaling Theory and Methods

The current research has also made a specific contribution to multidimensional scaling methods. Although it has an application to PCP, it may also have a wider significance. The contribution was the recognition that the INDSCAL scaling model is deficient, by virtue of the way in which it blends data to produce a group space from which individual subject spaces are derived. Presumably, in evaluating the peoples' perceptions, there is an interest in evaluating the similarities in their perceptions as well as the differences. Given that difference is the norm rather than the exception the blending that occurs in INDSCAL is not acceptable. In the current research it was observed that differences in cognitive structure over time for a single individual could not be faithfully retrieved using INDSCAL. Therefore, the blending problem was turned into an advantage by cloning first and second occasion data. Whilst this was of assistance because of the specific



problem in the current research it becomes problematic when differences between a number of individuals at one point in time or over time need to be assessed.

### **Contributions to Research on Work and Family**

The research has made a contribution to the research about work and family by carrying out an intensive longitudinal study of a group of men undergoing one of the most significant transitions in the life cycle. The transition to parenthood initiates a pattern of life which has long term implications for the individual concerned. An understanding of the immediate implications of that transition for men may be of benefit to policy makers. It may also assist managers in framing and implementing organisational policies which recognise the significance of the work-family interface.

### **Implications for Policy and Practice**

The extent to which the men in the study identified with their job or career varied. Only two could be described as having work as their 'central life interest' (Dubin, 1956). As was expected the role of father was salient for the men in the study. However, the socialisation that occurs for men does not emphasise the role in the same way that the role of mother is emphasised for women. Women also have a direct biological link with the development and birth of a baby that men do not and never can have. A perception appears to be that women are destined to be mothers. However, whilst most men become fathers, the rehearsal is not there in the same way that it is for women. One can argue that this is a function of the power relations that exist within society, but women are also active in the socialisation of their own sex and for developing in men expectations about what is appropriate behaviour for them. This was made clear to the researcher in the latter period of the research when he undertook to become the full-

time carer for his daughter. That experience, which began when she was seven months of age, provided an opportunity for the researcher and his partner to experience the reactions of men and women to the swapping of roles. Socialisation rituals were noted which are so common that they can be subliminal. However, given the topic of the research, the sensitivity to these issues was heightened.

From a policy and practice perspective this research suggests that, whilst opportunities may be made available for men to take advantage of parental leave and flexible work options, as a consequence of becoming a father, such opportunities may be only rarely availed of. None of the men interviewed indicated that they would take extended leave after the birth of their child. For example, three of the participants were in the teaching profession and one participant was married to a person who was also a teacher. Leave provisions have been quite flexible in this profession but none of the participants indicated that they had considered changing roles even for a short while. It was clear that the men saw the role of father as an expressive and an instrumental one and it was observed that the provider role had slipped from prominence. However, it also seems that certainly in the first year or so after the birth of a baby, roles become or revert to being traditional such that the mothers leave the workforce whilst men continue to maintain the responsibility for breadwinning. In the current research it could not be determined whether this was a matter of choice or not. Nevertheless government policy and organisational practice should promote flexible work options available for *men and women* who want to spend more time with their children whether that be in the early years or later on. An important reason for this is to change perceptions that the care of children is primarily the responsibility of women. There are other implications of the research for women. It seems that men continue to default the responsibility for unpaid work to their partners. This is problematic for women when they return to the

workforce. It may explain why as reported earlier in this thesis women with children under five years of age opt for part-time rather than full-time work.

### **Implications for Future Research**

In terms of the topic of the research two options for future research present. The first would be to conduct a follow-up study of the men who participated in the current research to report their subsequent experience as fathers. Such research would open up opportunities to explore issues such as the ongoing nature of the division of unpaid work and the effects of partners return to work on the management of work and family roles. Secondly this research would be strengthened by a large-scale longitudinal study of couples from more varied backgrounds in respect of the transition to parenthood. A strong case would have to be made for both partners to be actively involved as this was demonstrated to be a limitation of the current research.

In terms of methodology there are two specific opportunities. The first is the design and testing of an integrated piece of software that would make it possible to produce all of the analytical results at once. In the current research these results were produced by FUZZYGRID, SPSS and EXCEL.

The second opportunity is that in connection with the analysis of groups it may be possible to remedy the deficiency in the INDSCAL model by using Repertory Grids to generate dissimilarity matrices for groups. The basis of this approach would be to ask individuals to construe, for example, a problem or a product on a set of common constructs that may be generated by them through a separate procedure or supplied to them. The ratings could then be represented in a repertory grid where the elements are the individuals in the group. Thus a column in such a grid would show how an individual

used the set of constructs to portray the problem or product. Then by using FUZZYGRID the extent of agreement between the constructs could be indicated by producing a dissimilarity matrix and then using a classical MDS to produce a scaling map for them. The dissimilarity matrix for the elements could also be used in a classical MDS to produce a configuration showing those individuals who have similar perceptions. Perceptions could be assessed over time by cloning construct and element matrices for first occasion data and using INDSCAL to produce a reference configuration. Cloning could then also be applied to second or more occasion data such that INDSCAL could be used again to compare configurations. Thus, shifting coalitions could be observed over time whilst changes in the structure of beliefs could be assessed by tracking construct configurations.

The particular focus of the current research was organisational behaviour. The methodological developments appear to have applications in a range of areas beyond this including group dynamics, market research, political polling, issue analysis, mediation and career counselling. Further applied research is warranted in these areas.

MONASH UNIVERSITY LIBRARY



3 3168 01547335 4

A545.1

1

**PHD THESIS  
LIBRARY RELEASE AUTHORISATION**

SURNAME: ANDERSO

OTHER NAMES: ALASTAIR ANDERSON

ADDRESS: (valid for the next six months)

TELEPHONE: 0011 675 321 4878 OR 0011 675 322 220

TITLE OF THESIS: THE REPRESENTATION OF PERSONAL  
CONSTRUCTS AS FUZZY SUBSETS: <sup>DEVELOPING</sup> ~~THE~~ A MODEL AND  
TESTING ITS EFFICACY.  
(Please circle as appropriate)

1. I agree/do not agree that this thesis may be made available for consultation within the Library.
2. I agree/do not agree that this thesis may be available for photocopying.
3. I note that in any case, my consent is required only for the three years following acceptance of my thesis.

The Library, when supplying information to the national bibliographic database, often needs to distinguish between two or more authors of similar name. Your help, through providing the following additional details, would be appreciated.

DATE OF BIRTH: 09-04-56

OTHER PUBLICATIONS: (Title of book, publisher and date of publication)

Candidate's signature: \_\_\_\_\_

Date: 31/3/99

**DEPARTMENT'S RATIFICATION**

This is to ascertain that the Department has no objection to the candidate's options regarding access to the Library thesis copy. If so, please sign below and return the completed form to the Research Training and Support Branch, Research Services Division Building, Clayton Campus.

Supervisor's signature: .....

Date: .....

(Please print name).....

2475/3929

(Vol. 2)

0.

2

**THE REPRESENTATION OF PERSONAL CONSTRUCTS AS FUZZY SUBSETS  
DEVELOPING A MODEL AND TESTING ITS EFFICACY**

Alastair Andrew Anderson  
BEc , MBA (Mon) Grad Dip Ops Rsch (RMIT)

Thesis submitted in fulfilment of the requirements  
for the Degree of Doctor of Philosophy

Faculty of Business and Economics  
Department of Management  
Monash University  
March 1999



## VOLUME 2 — CONTENTS

<b>Appendix I — Preliminary Field Interviews</b>	1
Introduction	1
Interview A1.1: Tony	1
Interview A1.2: James	9
A Comparison of Tony and James	15
 <b>Appendix II — Sample FUZZYGRID Output</b>	17
Introduction	17
Sample Output: Example 4.1	18
 <b>Appendix III — The Pilot Study – Additional Cases</b>	39
Case A3.1: Tim and Evette	39
Case A3.2: Victor and Jenny	53
 <b>Appendix IV — Statistical Analysis of Questionnaire Data</b>	64
Introduction	64
A Profile of the Participant Couples	67
The Transition to Parenthood	78
Paid and Unpaid Work for On-Time and Late Fathers	82
The Transition to Fatherhood	97
Relationship Issues	115
Stressors During the Transition to Fatherhood	130
 <b>Appendix V — The Main Study – Additional Cases</b>	134
Case A5.1: John and Loretta	134
Case A5.2: Glen and Rona	162

<b>1</b>	<b>Appendix VI — Questionnaires and Forms</b>	<b>203</b>
	Explanation and Consent Form	204
	The First Questionnaire	207
	The Second Questionnaire	226
	Facsimile of Repertory Grid Form	250
	Sample Ellipse	251
<b>2</b>	<b>Appendix VII — Published Papers</b>	<b>252</b>
	The Marriage of Personal Construct Psychology and Fuzzy Logic	253
	A Model for Personal Construct Psychology	258
	<b>Bibliography</b>	<b>276</b>

## FIGURES

A1.1	-	Cognitive Map: Marriage and the Transition to Parenthood . . . . .	13
A5.1	-	Construct Map for John's Work-Nonwork Activities Grid . . . . .	140
A5.2	-	Element Map for John's Work-Nonwork Activities Grid . . . . .	141
A5.3	-	Construct Map for John's Work-People Grid . . . . .	145
A5.4	-	Element Map For John's Work-People Grid . . . . .	146
A5.5	-	Construct Map for John's Nonwork-People Grid . . . . .	151
A5.6	-	Element Map for John's Nonwork-People Grid . . . . .	151
A5.7	-	Construct Maps for Glen's Work-Nonwork Activities Grid . . . . .	168
A5.8	-	Element Maps for Glen's Work-Nonwork Activities Grid . . . . .	170
A5.9	-	Construct Maps for Glen's Work-People Grid . . . . .	177
A5.10	-	Element Maps For Glen's Work-People Grid . . . . .	180
A5.11	-	R-Square and Stress by Dimensionality (Constructs) . . . . .	186
A5.12	-	R-Square and Stress by Dimensionality (Elements) . . . . .	187
A5.13	-	Construct Maps for Glen's Nonwork-People Grid . . . . .	189
A5.14	-	Element Maps for Glen's Nonwork-People Grid . . . . .	192
A6.1	-	Facsimile of Repertory Grid Form . . . . .	250
A6.2	-	Sample of Ellipse used for Recording Elements . . . . .	251

## TABLES

A2.1	-	Fuzzy Grid for Politicians . . . . .	17
A2.2	-	Sample Output – Example 4.1 . . . . .	18
A3.1	-	Biographical Data for Tim and Evette . . . . .	40
A3.2	-	Tim's Descriptions of his Ideal Self . . . . .	41
A3.3	-	Work Related Data for Tim . . . . .	43
A3.4	-	Tim's Contributions to Household Work . . . . .	44
A3.5	-	Tim's Descriptions of Self as a Father . . . . .	48
A3.6	-	Tim's Contributions to Babycare . . . . .	49
A3.7	-	Relationship and Role Salience Data for Tim . . . . .	49
A3.8	-	Tim's Marital Satisfaction Levels and Spouse Relations . . . . .	50
A3.9	-	Parenting Stress Measures for Tim. . . . .	51
A3.10	-	Stress Ratings Reported by Tim . . . . .	52
A3.11	-	Biographical Data for Victor and Jenny . . . . .	54
A3.12	-	Victor's Descriptions of his Ideal Self . . . . .	55
A3.13	-	Work Related Data for Victor . . . . .	56
A3.14	-	Victor's Contributions to Household Work . . . . .	57
A3.15	-	Victor's Descriptions of Self as a Father . . . . .	58
A3.16	-	Victor's Contributions to Babycare . . . . .	59
A3.17	-	Relationship and Role Salience Data for Victor . . . . .	60
A3.18	-	Victor's Marital Satisfaction Levels and Spouse Relations . . . . .	61
A3.19	-	Parenting Stress Measures for Victor . . . . .	61
A3.20	-	Stress Ratings Reported by Victor . . . . .	62
A4.1	-	Age and Marital Status of Participant Couples . . . . .	67
A4.2	-	Age Differences Between Participants and Partners at First Marriage . . . . .	70
A4.3	-	Mean Age at First Marriage by Occupational Status . . . . .	71
A4.4	-	Educational Attainments of Participants and Partners . . . . .	77
A4.5	-	Age of Participants and Partners at First Interview . . . . .	79
A4.6	-	Age of On-Time and Late-Fathers and Partners . . . . .	80
A4.7	-	Participants Contributions to Paid and Unpaid Work . . . . .	88
A4.8	-	Partners Paid Work and Contributions of Participants to Feminine Tasks . . . . .	90
A4.9	-	Sex Role Type and Attitudes Towards Women. . . . .	91
A4.10	-	Sex Role Type and Contribution to Feminine Tasks . . . . .	91
A4.11	-	ANOVA for Attitudes Towards Women by Sex Role Type . . . . .	93
A4.12	-	ANOVA for Sex Role Type and Contributions to Feminine Tasks. . . . .	94
A4.13	-	Participants Satisfaction with the Division of Unpaid work . . . . .	96

A4.14	–	Descriptions of Self by Sex Role Classification . . . . .	99
A4.15	–	Work Related Commitment Levels by Subgroup . . . . .	108
A4.16	–	Contributions to Babycare by Sex Role Classification . . . . .	111
A4.17	–	Item Analysis by Subgroup for Contributions to Babycare . . . . .	114
A4.18	–	Relationship Characterisation over Time . . . . .	118
A4.19	–	Ranking of Roles over Time . . . . .	122
A4.20	–	Differences in Role Rankings Between Subgroups . . . . .	124
A4.21	–	Differences in Means for Life Role Salience Scales by Subgroup . . . . .	125
A4.22	–	Changes in Relationship Satisfaction . . . . .	126
A4.23	–	Changes in Relationship Satisfaction by Subgroup . . . . .	127
A4.24	–	Perceptions of Freedom in Relationship . . . . .	128
A4.25	–	Satisfaction with Time to Pursue own Nonwork Activities . . . . .	129
A4.26	–	Parenting Stress Scores by Subgroup. . . . .	131
A4.27	–	Stressor Scores By Subgroup . . . . .	133
A5.1	–	Biographical Data for John and Loretta . . . . .	135
A5.2	–	John's Descriptions of his Ideal Self . . . . .	136
A5.3	–	John's Work-Nonwork Activities Grid . . . . .	138
A5.4	–	Analytical Results for John's Work-Nonwork Activities Grid. . . . .	139
A5.5	–	John's Work-People Grid . . . . .	143
A5.6	–	Analytical Results for John's Work-People Grid . . . . .	144
A5.7	–	John's Nonwork-People Grid . . . . .	148
A5.8	–	Analytical Results for John's Work-People Grid . . . . .	150
A5.9	–	Work Related Data for John . . . . .	153
A5.10	–	John's Contributions to Household Work . . . . .	154
A5.11	–	John's Contributions to Babycare . . . . .	157
A5.12	–	Relationship and Role Salience Data for John . . . . .	157
A5.13	–	John's Marital Satisfaction Levels and Spouse Relations . . . . .	158
A5.14	–	Parenting Stress Measures for John . . . . .	159
A5.15	–	Stress Ratings Reported by John . . . . .	159
A5.16	–	Salience of Job Attributes for John and Len . . . . .	161
A5.17	–	Biographical Data for Glen and Rona . . . . .	162
A5.18	–	Glen's Descriptions of his Ideal Self . . . . .	163
A5.19	–	Glen's Work-Nonwork Activities Grid . . . . .	164
A5.20	–	Analytical Results for Glen's Work-Nonwork Activities Grid. . . . .	166
A5.21	–	FPWMDS Model Statistics for Glen's Work-Nonwork Activities Grid. . . . .	167
A5.22	–	Glen's Work-People Grid . . . . .	172

A5.23	- Analytical Results for Glen's Work-People Grid . . . . .	174
A5.24	- FPWMDS Model Statistics for Glen's Work-People Grid. . . . .	175
A5.25	- Glen's Nonwork-People Grid . . . . .	182
A5.26	- Analytical Results for Glen's Nonwork-People Grid . . . . .	185
A5.27	- FPWMDS Model Statistics for Glen's Nonwork-People Grid . . . . .	188
A5.28	- Work Related Data for Glen . . . . .	194
A5.29	- Glen's Contributions to Household Work . . . . .	196
A5.30	- Glen's Descriptions of Self as a father. . . . .	197
A5.31	- Glen's Contributions to Babycare . . . . .	198
A5.32	- Relationship and Role Salience Data for Glen . . . . .	199
A5.33	- Glen's Marital Satisfaction Levels and Spouse Relations . . . . .	200
A5.34	- Parenting Stress Measures for Glen . . . . .	201
A5.35	- Stress Ratings Reported by Glen . . . . .	201

## **APPENDIX I**

### **PRELIMINARY FIELD INTERVIEWS**

#### **Introduction**

This appendix contains a record of two interviews conducted early in the period of the current research. The purpose of the interviews was to trial two methods of construct elicitation and to explore work, family and relationship issues. These were the self-characterisation and a variant which also employed cognitive mapping techniques. Prior to the commencement of each interview the ethical standards which governed the conduct of the research were explained, including the steps which would be taken to safeguard the anonymity of the participant. The interviews were tape-recorded with the consent of the participants. The name of the participants are fictitious. Other details have been selectively altered without affecting the integrity of the interview content.

The interview pertaining to the first mentioned method is reported below.

#### **Interview A1.1: Tony**

Tony was born in Melbourne in April 1951. He is the fourth child of his parents who had six children in all. In 1955 the family moved to Mildura where Tony's parents purchased and developed a dried fruit block. Tony was educated at a Catholic primary school and subsequently attended Mildura High School. He gained his matriculation certificate in 1969 and undertook a law degree at Adelaide University, graduating in 1970. Tony is

married with four children. At the time of interview the eldest was thirteen and the youngest was three. Tony's parents are still living in Mildura and are in their early eighties.

In 1975 Tony commenced his professional career as a solicitor by joining a small legal practice in Adelaide. In 1990 he changed the direction of his professional career by establishing his own practice in his hometown of Mildura.

The question below was shown to Tony and he was asked to respond to it.

*Can you recall the events which you think mark the transitions from your childhood into your teenage years, then the transition into your young adult life and so on?*

An edited version of his lengthy response with commentary by the researcher is reported below. Where there are direct and lengthy quotations from the interview transcript **(T)** is used to signify Tony and **(R)** is used to signify the researcher. Shorter responses within the text are signified by single quotation marks.

### **Emerging Career Ambitions**

When Tony was in year ten at school he came to understand that if he applied himself then he could succeed. This would allow him to have a life that was fundamentally different to that of his parents. Tony remarked:

**(T)** In fourth form a realisation came upon me that if I really knuckled down at school I could make something of my life.

Tony viewed education as a way to a better quality life. This was a powerful motivator for him.



Tony had a vivid memory of the working life of his parents. On two occasions during the interview he drew a strong contrast between their working life and the opportunities which would open up for him if he achieved a university degree. The following extract is illustrative.

(R) When did you start thinking about law, was it always law?

(T) No, no, it was always to do well and better than my own parents, in the sense that my parents only knew a life on the fruit block. My ambition was to get a job where I didn't have to necessarily dirty my hands. I went to work with a collar and tie.

In this extract the contrast which Tony drew between manual work and professional work is quite vivid. Block work was 'dirty' whereas professional occupations were clean requiring a 'collar and tie'. The quality of the working life of his parents had made a strong impact on him. The idea of it being a dirty kind of life was repeated again later in the interview.

Tony was probed again to see if law had been his primary objective. The following extract illustrates.

(R) When you were in fourth form you didn't necessarily think about law?

(T) Getting the marks and doing well, as long as I could get in somewhere. To even land an office job as long as I could steer away from block life, which I consider my parents considered an advance from what they had. They went to work on the block where they had to wear overalls, get dirty hands etc. To get an office job ... that in itself would have been an achievement.

Again this extract is vivid, it has affect and is repetitious. It makes it clear that Tony had an aversion to his parents' kind of life. This was a motivator as far as his schoolwork was concerned.

## **The Centrality of Work**

From the time of his fourth year in secondary education until he was 39 the pattern was one of unrelenting hard work often at the expense of his social life and indeed his marriage and family life. Ultimately this pattern of work caused some problems for him

The following extracts illustrate this point:

(T) It was only when I reached fourth and fifth form that I really knuckled down and disciplined myself. Major events that marked the transition from child to teenage years, really there was none. My life was wholly projected towards study and school work.

The theme of hard work and discipline are repeated here with strong and evocative words such as 'discipline' and 'hard work'. Tony had little social life as was indicated when earlier he had described his life as a teenager as "staid".

(T) I felt that I had only one objective and that was to do well at school. To that extent any sporting ambitions I may have had went by the wayside.

When Tony went to university it is clear that he was somewhat of a recluse. The following extract supports this inference:

(R) Did you go out much when you were young?

(T) No.

(T) Of course when I got to university there was a bit of social life.

Tony said of his university studies:

(T) Again having reached university I thought to myself I have reached higher in my education than any other member of my family, the first ever to reach university in the history of the family, and because of that I could see the other side. I could see that with a bit more dedication and hard work and commitment I could get my degree. What that meant for me was a certain degree of satisfaction but also a degree of satisfaction for my mother and father who had worked so hard to give their children an education, and that pushed me a bit more, so that commitment took my time wholly.

In short, Tony's ambitions were ignited in fourth year secondary and he began to drive himself hard from that point on. He appeared to be motivated by two factors. The desire

to avoid the kind of life his parents had on the block and to make his parents proud of him. The following extract illustrates this point.

(R) What was it like when you found out that you had been accepted for law? Do you remember that day?

(T) Oh very, very excited that I was going to make something of myself, I was going to make my mother and father very proud.

Tony did not pause for breath; it was on with the hard work as illustrated by the extract below.

(R) Were you at home that day when you found out?

(T) Yeah, yeah, yeah.

(R) Did you have a big celebration?

(T) No, didn't because that was only the beginning then...What was more important to me was to get the degree ... the law degree at that time was far more prestigious than it is today ... maybe because there weren't many lawyers around in those times.

The last response indicates that by the time he had attained university entrance Tony was very cognisant of the status which a law degree would bestow upon him.

When Tony finished university the self-imposed work pressure continued as illustrated below.

(T) In fact I finished my last exam on November 18, 1973. That was a Thursday, I had the Friday, Saturday and Sunday off and on the Monday I started working.

This statement is one of two which Tony made in the interview that indicated the development of a compulsion to work hard. The second statement was made in connection with the pressure of work which Tony felt whilst working with the legal firm in Adelaide.

(T) I just felt the pressure then but I thought it will get better, it will get better. I remember on one occasion, my parents had rented a holiday house at the beach and the firm was closing for two weeks from December twenty third until the sixth or seventh of January. I remember cutting my holiday short and going back to the office to get work ready for the secretaries. I cut my honeymoon short to go back to work.

The issue which arose was whether or not the role strain which emerged when Tony was employed as a Solicitor was self-imposed or imposed by the excessive work load imposed on him by his firm. Tony's long term commitment to hard work suggested that it was self-imposed.

The drive to work hard had begun to affect Tony and also his relationships with his wife, his children and his parents as indicated in the following:

(T) When I had to attend court hearings or to go to the workers compensation board I used to be very, very, very, I used to suffer from anxiety attacks because I was away from the office. What if someone comes in with a problem and I'm not there to answer it? What if someone gets on the phone and wants to speak to me urgently.

(T) I had these problems these anxiety feelings.

(R) Really!

(T) Yes.

(R) Why?

(T) Don't know, like I can leave the office and I can sometimes get a little bit anxious...Like say for example today, I finished my court work early. I thought to myself or will I go home or will I go back to work?

(R) What did you do?

(T) I went back to work.

(R) Why?

(T) I thought a client might want to speak to me.

Because the pressure of work had emerged as an issue the following question was posed:

(R) *Was there much tension between your work and your family before you went out on your own?*

(T) Yes, there was, that's a very good question.

(T) I got to the stage where my wife wasn't sure how she was going to find me. Whether I was going to be in a good mood or a rotten mood. Whether I would have the whole world on my shoulders or be as free as a bird...That is how mercurial I was with my moods.

(T) It got to that stage where clients would get me very upset and I would come home in a rotten mood and go off at the kids and she'd say "it's not fair that you take it out on the children, you come home and switch off". I couldn't. And that's the reason why I left (the firm), I just couldn't...I just didn't enjoy the pressure of that kind of work.

Tony decided to move from Adelaide back to Mildura and set up his own legal practice.

Commenting on his new direction Tony remarked:

(T) It was a very onerous task but it wasn't as tough as dealing with the demands in a bigger firm. I enjoyed it.

(T) Getting the firm established is going to be a burden on my wife and children, but after that, I hope to spend whatever free time I have with my wife and children.

Tony described the practice as 'a big commitment'.

### **Work and Major Life Events**

The centrality of work transcended two major events in Tony's life, his marriage and the birth of his first child. The following extracts are illustrative:

(R) So when did you get married?

(T) I got married in 1979.

(R) When you got married did you find that a big change?

(T) No I didn't ... I think because I was very tied to my work and I let my work to a large degree influence my life or dictate my life, I didn't notice any marked transition. My sole objective when I was single was to do well at work and satisfy clients needs, and the same occurred when I was married to my wife, to do well with my clients, and so I don't know whether there was any real transition...But really when it's all said and done we just knuckled down, my wife did her work and I did my bit to pay off our own home and have a comfortable life. But I don't know whether there was any real transition.

(R) What about when your first child was born? How did you find that?

(T) Again I don't wish too sound repetitive, but it was a wonderful experience of course I witnessed the birth of my child, my first daughter Jessica...Again, em, it didn't affect my life because, obviously it affects your life, but it didn't affect my thinking or my character in any way because I had a job which consumed me. I was totally dedicated, rightly or wrongly, totally dedicated to my work, which meant satisfying the clients needs...So even when my child was born, my wife was there to look after the child and I just concentrated solely on my work. Rightly or wrongly that's the way it was.

In summary, Tony was a person whose career ambitions very strongly influenced by his family background. Early in life he became aware of his potential to excel at his studies and the benefits that would accrue from this. Education would open a gateway to a high status occupation. Thus, Tony became single minded in his efforts to achieve his educational goals. Remarking on his life Tony said:

(T) I think that my purpose in life has been one that's to get the education.

Until the age of thirty-nine Tony's life was characterised by an unrelenting drive to do well, satisfy his clients and to repay the sacrifices which his parents had made for him and the encouragement which they had always given to him. However, death of a close relative was a catalyst for the change of direction that was effected when Tony established his own legal practice. Nevertheless Tony's personality continued to be expressed through hard work and a very strong desire to please others. Thus, despite the change of direction he still worked extremely hard.

Towards the conclusion of the interview Tony was asked to write down five free responses to the question, Who am I? He responded as follows:

- A good man, acting with good conscience;
- Family man;
- Committed to work;
- Responsible man;
- Very sensitive man.

Given the pattern which emerged in the interview Tony's first response was at first glance somewhat surprising. Work did not appear to be as salient as expected given that it appeared as third on the list in his self-description. However, on reflection it made sense. Tony's self perception of himself as a 'good man' who 'acting with good conscience' was reflected in his commitment to hard work. Hard work appeared to be the way in which he gave expression to his self-concept, even though this has caused him some personal difficulty and strain in his relationships.

## Interview A1.2: James

The second interview reported here was conducted with James. The format of the interview was the same as the first in that he was asked to recount his life from his teenage years and the memories which he felt were self-defining.

Following this the software package **Graphics-COPE** (Ackermann, Moriarty, Cropper & Eden, 1992) which was installed on a laptop computer was used in conjunction with an interview protocol to elicit a cognitive map. The intention was elicit a map which showed the perspective of James on life after marriage, the goals which had been resolved, and the character of his married life after the birth of the first child.

James was born in 1959 at Hamilton in Victoria. He has two brothers and one half brother from his father's second marriage. He has no sisters. Both of his biological parents are still living. When James was in grade six his parents divorced and he moved to Geelong where he lived with his mother and two brothers.

James was born into a family which had a strong tradition in the law. His great-great grandfather started the family firm in which both of his full brothers were working as partners at the time of the interview. His father although seventy-one at that time also worked as a senior partner in the office at Hamilton.

The question below was shown to James and he was asked to respond to it.

*Can you recall the events which you think mark the transitions from your childhood into your teenage years, then the transition into your young adult life and so on?*

An edited version of his response with commentary by the researcher is reported below.

## Secondary School Years

James was enrolled at and attended Melbourne Grammar School in his first year secondary but this did not suit him and he was lonely in the boarding school environment. Three generations of his family including his full brothers had attended that school which was seen as a logical precursor to a law degree before entering the family legal practice. He described Melbourne Grammar as 'academicy' and that he was not suited to it because he leaned more to the 'arts side'. His parents divorce also caused him to miss six months of school before first attending Melbourne Grammar.

Thus, shortly after beginning there James moved back to Geelong and enrolled in the local high school where he developed an interest in art and photography. The impression was that his parents divorce had a strong effect on him particularly as he was the youngest in the family.

James was vague but not elusive about much of the period of the divorce but described himself at that time as 'nervousy and twitchy'. He recalled that he had trouble with weight gain during the period of his parents separation and divorce. He indicated that his parents divorce had 'reinforced the family values'. He was cognisant of his family history and he 'made a pledge' to his wife not to repeat it. He said 'there's things I think I have missed out on, which hopefully with having our own children I be able to get back somehow'.

James liked living in Geelong and was particularly fond of the surfing life. He described it as a 'great place to grow up'. It was familiar and not as lonely as or daunting as



Melbourne had been. He described his experience at high school as 'great, fantastic... made a lot of good friends there'. It was 'ten times better than boarding school'.

### **Adult Life**

James completed year twelve and a three year program with a major in photography at the Prahran College. He worked for a photography studio for six years from the age of twenty and subsequently traveled to England where he worked as a travel photographer for eighteen months. James returned from overseas in June 1987. He moved to Melbourne shortly after that and commenced work with a photography studio in St Kilda. Following his return he was 'tracked down' by Jane whom he had known since 1980. They had maintained contact with, 'cards and that sort of thing' since that time. Jane moved to Melbourne from Geelong in January 1988 and she and James married in September 1989.

James said that it had been a longstanding goal to save enough money to go overseas to work. However, after returning to Australia he said to himself, 'right I've done that what am I doing now'. He described his life in Melbourne as 'just plodding around a bit, working for a studio'.

### **Marriage**

In regard to marriage James said that after returning from overseas 'he did not want to commit too heavily, keep his options open', and yet he was searching for some direction some new goals to which he could set his mind. He said that his relationship with Jane and the prospect of marriage helped him to 'get the goals organised again'.

James was probed about his readiness for marriage as the following text reveals:

(R) Did you think you were ready when you got married?

(J) I think so (with positive emphasis), well I was thirty.

This response indicated that despite his earlier reservations James was ready for marriage and also aware of his age.

James remarked in connection with his marriage that 'we were pretty keen on having children so we didn't muck around that much'.

### **Testing a Cognitive Mapping Protocol**

At this point in the interview James was shown another question which was:

*Can you describe for me your marriage, the experience of deciding to have you first child, the period of the pregnancy and the period following the birth of your first child?*

The remainder of the interview was conducted using the **COPE** software. Responses which were indicative of constructs were recorded, James was asked to elaborate on them and to indicate whether they were related to any of the other constructs which had already been recorded on the map. The cognitive map shown as Figure A1.1 below shows the constructs elicited by this process. To safeguard the identity of the participants details of names and dates have been erased in nodes 1, 10, 13, 25, 27, 36. This has no material effect.

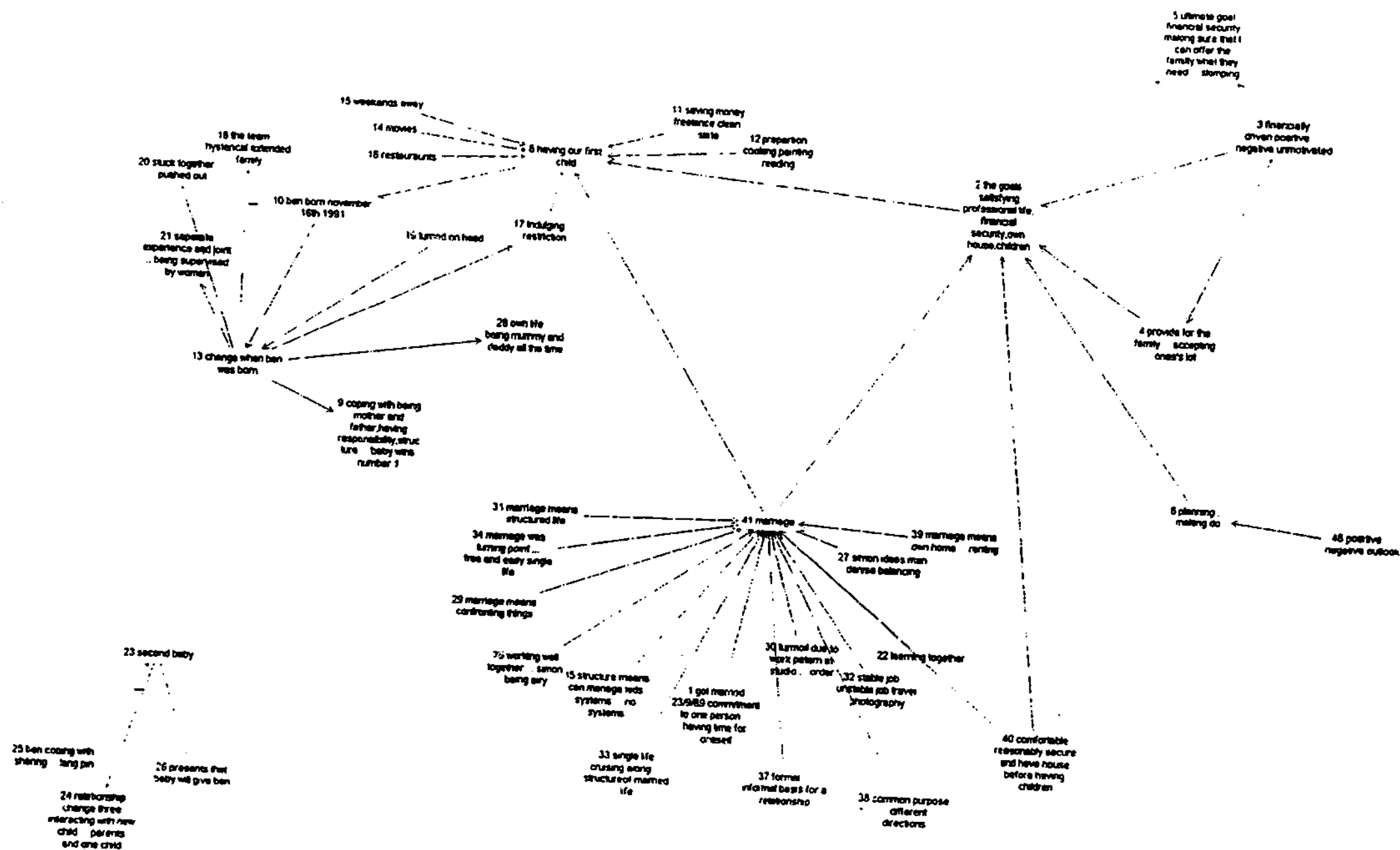


Figure A1.1: Cognitive Map: Marriage and the Transition to Parenthood

## Commentary on the Cognitive Map

As may be seen from this map, the central element in the life of James was his *marriage* (node 41). This is the busiest node in the map. It is directly connected with a number of goals (node 2) *the goals, satisfying professional life, financial security, own house, children*. Financial security was a superordinate goal and is represented by *ultimate financial security, making sure that i can offer the family what they need – skimping* (node 5).

The decision to marry brought a number of issues into focus. These are shown as arcs connected to (node 41). Marriage initiated a *transition* (node 34) to:

- *stability* (nodes 30, 31, 32 and 33);
- *security*, (nodes 39 and 40);
- *systems and teamwork to get things done*, nodes (35, 36 and 38);
- *confronting issues in a formal committed relationship* (nodes 1 and 29);
- *learning together* (node 22) and
- *recognising and using the talents of each person* (node 27: James the *ideas man* and Jane *balancing things out*).

It is evident that James and Jane planned the birth of their first baby very carefully as indicated by *having our first child* (node 8). They arranged their financial affairs accordingly as indicated by *saving money, freelance work, clean slate* (node 11).

A construct related to having the first baby is *indulging – restriction* (node 17). In anticipation of the restrictions which would occur following the birth James and Jane spent a considerable amount of time going to restaurants (node 16), movies (node 14) and taking weekends away (node 15). They were realistic, optimistic and practical in planning for the arrival of Tim. They described the pattern of their life at the time of the interview as 'structured'. However, they still managed outings together which they viewed as important for their relationship and also for the quality of life within the family

as a whole. The emphasis in the management of the family was on balance and need fulfillment for every member.

There is evidence of significant change when Tim was born (node 13). The impression was that the internal dynamics were working well but that close relatives had caused them some concern. This is indicated in (node 18) *the team – the hysterical extended family*. James and Jane indicated that they were quite happy with their progress as parents but that they were *pushing out* by close relatives (node 20). They were very much aware of their *coping with being a mother and father having responsibility and structure* (node 9). They felt that *the baby wins number 1* (node 9) meaning that much of their time and effort was devoted to satisfying the baby's needs. James and Jane indicated that in retrospect they saw this a normal response to having their first child.

At the time of the interview James and Jane were expecting their second child. This appears as *second baby* (node 23). The concerns were the response of their son Tim to the second child, *Tim coping with sharing – king pin* and the change in relationships within the family, (node 24) *three interacting with new child – parents and one child*.

### **A Comparison of Tony and James**

Tony and James were similar in that each of them had manifested in their lives a strong work ethic and a desire for financial security. However, they were considerably different in that James was more focused on his role as a father and more balanced in his overall lifestyle. As indicated he was considerably affected by his parent's divorce. This appeared to firm his resolve to have a good marriage and to be a good father.

James and Tony were contrasting in respect of their backgrounds and this may explain their difference in respect of the centrality of work. Tony's migrant background magnified his need for achievement. James who was from an affluent background appeared to be less affected by such a need.

## APPENDIX II

### SAMPLE FUZZYGRID OUTPUT

#### Introduction

This appendix contains sample output generated by FUZZYGRID. The output is based on the data from Example 4.1 in chapter 4. The grid is reproduced in Table A2.1 below.

Table A2.1: Fuzzy Grid For Politicians

Fuzzy Subsets Constructs/Elements	$\tilde{E}_1$	$\tilde{E}_2$	$\tilde{E}_3$	$\tilde{E}_4$
$\tilde{C}_1$ : Arrogant	1.0	0.4	0.5	1.0
$\tilde{C}_2$ : Shrewd	0.5	0.6	0.8	0.1
$\tilde{C}_3$ : Rude in public	1.0	0.1	0.4	0.9
$\tilde{C}_4$ : Capitalist focus	1.0	0.8	0.6	1.0

The output appears below. Since the output is very long when the step size is large a step size of 0.25 has been used such that  $\alpha_i = 0.00, 0.25, 0.50, 0.75, 1.00, 0 \leq i \leq 5$ .

**Table A2.2: Sample Output – Example 4.1**

filename = ex41.dat

This is the RAW DATA MATRIX.  
The matrix is a 4 x 4 matrix.

```
1.0  0.4  0.5  1.0
0.5  0.6  0.8  0.1
1.0  0.1  0.4  0.9
1.0  0.8  0.6  1.0
```

\*\*\*\*\*

Alpha step size is 0.250  
Number of alpha steps = 4

```
alpha[1] = 0.250
alpha[2] = 0.500
alpha[3] = 0.750
alpha[4] = 1.000
```

filename = ex41.dat

This is the RAW DATA MATRIX  
The matrix is a 4 x 4 matrix.

```
1.0  0.4  0.5  1.0
0.5  0.6  0.8  0.1
1.0  0.1  0.4  0.9
1.0  0.8  0.6  1.0
```

\*\*\*\*\*

These are the FUZZY MATRICES  
These matrices are 4 x 4 matrices.

```
1.0  0.5  1.0  1.0
0.5  0.5  0.5  0.5
1.0  0.5  1.0  1.0
1.0  0.5  1.0  1.0
```

\*\*\*\*\*

```
0.4  0.4  0.1  0.4
0.4  0.6  0.1  0.6
0.1  0.1  0.1  0.1
0.4  0.6  0.1  0.8
```

\*\*\*\*\*



0.5	0.5	0.4	0.5
0.5	0.8	0.4	0.6
0.4	0.4	0.4	0.4
0.5	0.6	0.4	0.6

\*\*\*\*\*

1.0	0.1	0.9	1.0
0.1	0.1	0.1	0.1
0.9	0.1	0.9	0.9
1.0	0.1	0.9	1.0

\*\*\*\*\*

\*\*\*\*\*  
 These are the HARD FUZZY MATRICES  
 These matrices are 4 x 4 matrices.

alpha = 0.250      column number = 1

1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0

\*\*\*\*\*

alpha = 0.250      column number = 2

1.0	1.0	0.0	1.0
1.0	1.0	0.0	1.0
0.0	0.0	0.0	0.0
1.0	1.0	0.0	1.0

\*\*\*\*\*

alpha = 0.250      column number = 3

1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0

\*\*\*\*\*

alpha = 0.250      column number = 4

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.250      column number = 1

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

\*\*\*\*\*

alpha = 0.250      column number = 2

1.0 1.0 0.0 1.0

1.0 1.0 0.0 1.0

0.0 0.0 0.0 0.0

1.0 1.0 0.0 1.0

\*\*\*\*\*

alpha = 0.250      column number = 3

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

\*\*\*\*\*

alpha = 0.250      column number = 4

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 0.250 is :

0.000 0.563 1.000 0.563

0.563 0.000 0.563 0.286

1.000 0.563 0.000 0.563

0.563 0.286 0.563 0.000

\*\*\*\*\*

These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.500      column number = 1

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

\*\*\*\*\*

alpha = 0.500      column number = 2

0.0 0.0 0.0 0.0

0.0 1.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 1.0 0.0 1.0

\*\*\*\*\*

alpha = 0.500      column number = 3

1.0 1.0 0.0 1.0

```

1.0  1.0  0.0  1.0
0.0  0.0  0.0  0.0
1.0  1.0  0.0  1.0

```

\*\*\*\*\*

alpha = 0.500 column number = 4

```

1.0  0.0  1.0  1.0
0.0  0.0  0.0  0.0
1.0  0.0  1.0  1.0
1.0  0.0  1.0  1.0

```

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.500 column number = 1

```

1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0

```

\*\*\*\*\*

alpha = 0.500 column number = 2

```

0.0  0.0  0.0  0.0
0.0  1.0  0.0  1.0
0.0  0.0  0.0  0.0
0.0  1.0  0.0  1.0

```

\*\*\*\*\*

alpha = 0.500 column number = 3

```

1.0  1.0  0.0  1.0
1.0  1.0  0.0  1.0
0.0  0.0  0.0  0.0

```

1.0 1.0 0.0 1.0

\*\*\*\*\*

alpha = 0.500 column number = 4

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 0.500 is :

0.000 0.250 0.563 0.563

0.250 0.000 0.444 0.083

0.563 0.444 0.000 0.286

0.563 0.083 0.286 0.000

\*\*\*\*\*

These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.750 column number = 1

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

alpha = 0.750 column number = 2

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 1.0

\*\*\*\*\*

alpha = 0.750 column number = 3

0.0	0.0	0.0	0.0
0.0	1.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0

\*\*\*\*\*

alpha = 0.750 column number = 4

1.0	0.0	1.0	1.0
0.0	0.0	0.0	0.0
1.0	0.0	1.0	1.0
1.0	0.0	1.0	1.0

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.750 column number = 1

1.0	0.0	1.0	1.0
0.0	0.0	0.0	0.0
1.0	0.0	1.0	1.0
1.0	0.0	1.0	1.0

\*\*\*\*\*

alpha = 0.750 column number = 2

0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	1.0

\*\*\*\*\*

alpha = 0.750 column number = 3

```

0.0  0.0  0.0  0.0
0.0  1.0  0.0  0.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0

```

\*\*\*\*\*

alpha = 0.750      column number = 4

```

1.0  0.0  1.0  1.0
0.0  0.0  0.0  0.0
1.0  0.0  1.0  1.0
1.0  0.0  1.0  1.0

```

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 0.750 is :

```

0.000  0.111  0.000  1.000
0.111  0.000  0.000  0.111
0.000  0.000  0.000  0.000
1.000  0.111  0.000  0.000

```

\*\*\*\*\*

These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 1.000      column number = 1

```

1.0  0.0  1.0  1.0
0.0  0.0  0.0  0.0
1.0  0.0  1.0  1.0
1.0  0.0  1.0  1.0

```

\*\*\*\*\*

alpha = 1.000      column number = 2

```

0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0

```

0.0 0.0 0.0 0.0

\*\*\*\*\*

alpha = 1.000 column number = 3

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

\*\*\*\*\*

alpha = 1.000 column number = 4

1.0 0.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

1.0 0.0 0.0 1.0

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*  
These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 1.000 column number = 1

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

alpha = 1.000 column number = 2

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0



\*\*\*\*\*

alpha = 1.000 column number = 3

0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0

\*\*\*\*\*

alpha = 1.000 column number = 4

1.0	0.0	0.0	1.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
1.0	0.0	0.0	1.0

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 1.000 is :

0.000	0.000	0.000	0.444
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000
0.444	0.000	0.000	0.000

for alpha = 0.000 K = 1.0000

for alpha = 0.250 K = 0.3912

for alpha = 0.500 K = 0.1636

for alpha = 0.750 K = 0.1708

for alpha = 1.000 K = 0.0329

Element Consensus is 0.5572

This is the similarity matrix

0.0000	0.4720	0.6739	0.7469
--------	--------	--------	--------

0.4720	0.0000	0.5035	0.3876
0.6739	0.5035	0.0000	0.4738
0.7469	0.3876	0.4738	0.0000

This is the dissimilarity matrix

0.0000	0.5280	0.3261	0.2531
0.5280	0.0000	0.4965	0.6124
0.3261	0.4965	0.0000	0.5262
0.2531	0.6124	0.5262	0.0000

This is the TRANSPOSED RAW DATA MATRIX  
The matrix is a 4 x 4 matrix.

1.0	0.5	1.0	1.0
0.4	0.6	0.1	0.8
0.5	0.8	0.4	0.6
1.0	0.1	0.9	1.0

\*\*\*\*\*

These are the FUZZY MATRICES  
These matrices are 4 x 4 matrices.

1.0	0.4	0.5	1.0
0.4	0.4	0.4	0.4
0.5	0.4	0.5	0.5
1.0	0.4	0.5	1.0

\*\*\*\*\*

0.5	0.5	0.5	0.1
0.5	0.6	0.6	0.1
0.5	0.6	0.8	0.1
0.1	0.1	0.1	0.1

\*\*\*\*\*

1.0	0.1	0.4	0.9
0.1	0.1	0.1	0.1
0.4	0.1	0.4	0.4
0.9	0.1	0.4	0.9

\*\*\*\*\*

1.0	0.8	0.6	1.0
-----	-----	-----	-----

```

0.8  0.8  0.6  0.8
0.6  0.6  0.6  0.6
1.0  0.8  0.6  1.0

```

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*  
These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.250      column number = 1

```

1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0

```

\*\*\*\*\*

alpha = 0.250      column number = 2

```

1.0  1.0  1.0  0.0
1.0  1.0  1.0  0.0
1.0  1.0  1.0  0.0
0.0  0.0  0.0  0.0

```

\*\*\*\*\*

alpha = 0.250      column number = 3

```

1.0  0.0  1.0  1.0
0.0  0.0  0.0  0.0
1.0  0.0  1.0  1.0
1.0  0.0  1.0  1.0

```

\*\*\*\*\*

alpha = 0.250      column number = 4

```

1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0

```

```
1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0
```

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.250 column number = 1

```
1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0
```

\*\*\*\*\*

alpha = 0.250 column number = 2

```
1.0 1.0 1.0 0.0
1.0 1.0 1.0 0.0
1.0 1.0 1.0 0.0
0.0 0.0 0.0 0.0
```

\*\*\*\*\*

alpha = 0.250 column number = 3

```
1.0 0.0 1.0 1.0
0.0 0.0 0.0 0.0
1.0 0.0 1.0 1.0
1.0 0.0 1.0 1.0
```

\*\*\*\*\*

alpha = 0.250 column number = 4

```
1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0
```

1.0 1.0 1.0 1.0

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 0.250 is :

0.000 0.563 0.563 1.000

0.563 0.000 0.286 0.563

0.563 0.286 0.000 0.563

1.000 0.563 0.563 0.000

\*\*\*\*\*

These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.500 column number = 1

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

alpha = 0.500 column number = 2

1.0 1.0 1.0 0.0

1.0 1.0 1.0 0.0

1.0 1.0 1.0 0.0

0.0 0.0 0.0 0.0

\*\*\*\*\*

alpha = 0.500 column number = 3

1.0 0.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

1.0 0.0 0.0 1.0

\*\*\*\*\*

alpha = 0.500 column number = 4

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

1.0 1.0 1.0 1.0

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.500 column number = 1

1.0 0.0 1.0 1.0

0.0 0.0 0.0 0.0

1.0 0.0 1.0 1.0

1.0 0.0 1.0 1.0

\*\*\*\*\*

alpha = 0.500 column number = 2

1.0 1.0 1.0 0.0

1.0 1.0 1.0 0.0

1.0 1.0 1.0 0.0

0.0 0.0 0.0 0.0

\*\*\*\*\*

alpha = 0.500 column number = 3

1.0 0.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

1.0 0.0 0.0 1.0

\*\*\*\*\*

alpha = 0.500 column number = 4

1.0 1.0 1.0 1.0

```

1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0
1.0  1.0  1.0  1.0

```

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 0.500 is :

```

0.000  0.286  0.444  0.563
0.286  0.000  0.083  0.563
0.444  0.083  0.000  0.250
0.563  0.563  0.250  0.000

```

\*\*\*\*\*

These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.750      column number = 1

```

1.0  0.0  0.0  1.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
1.0  0.0  0.0  1.0

```

\*\*\*\*\*

alpha = 0.750      column number = 2

```

0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
0.0  0.0  1.0  0.0
0.0  0.0  0.0  0.0

```

\*\*\*\*\*

alpha = 0.750      column number = 3

```

1.0  0.0  0.0  1.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0

```

1.0 0.0 0.0 1.0

\*\*\*\*\*

alpha = 0.750 column number = 4

1.0 1.0 0.0 1.0

1.0 1.0 0.0 1.0

0.0 0.0 0.0 0.0

1.0 1.0 0.0 1.0

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 0.750 column number = 1

1.0 0.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

1.0 0.0 0.0 1.0

\*\*\*\*\*

alpha = 0.750 column number = 2

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

0.0 0.0 1.0 0.0

0.0 0.0 0.0 0.0

\*\*\*\*\*

alpha = 0.750 column number = 3

1.0 0.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

1.0 0.0 0.0 1.0



\*\*\*\*\*

alpha = 0.750 column number = 4

1.0	1.0	0.0	1.0
1.0	1.0	0.0	1.0
0.0	0.0	0.0	0.0
1.0	1.0	0.0	1.0

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 0.750 is :

0.000	0.000	1.000	0.444
0.000	0.000	0.000	0.000
1.000	0.000	0.000	0.444
0.444	0.000	0.444	0.000

\*\*\*\*\*

These are the HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 1.000 column number = 1

1.0	0.0	0.0	1.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
1.0	0.0	0.0	1.0

\*\*\*\*\*

alpha = 1.000 column number = 2

0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0

\*\*\*\*\*

alpha = 1.000 column number = 3

1.0	0.0	0.0	0.0
-----	-----	-----	-----

```
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
```

\*\*\*\*\*

alpha = 1.000 column number = 4

```
1.0  0.0  0.0  1.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
1.0  0.0  0.0  1.0
```

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*  
These are the TRANSPOSED HARD FUZZY MATRICES  
These matrices are 4 x 4 matrices.

alpha = 1.000 column number = 1

```
1.0  0.0  0.0  1.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
1.0  0.0  0.0  1.0
```

\*\*\*\*\*

alpha = 1.000 column number = 2

```
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
```

\*\*\*\*\*

alpha = 1.000 column number = 3

```
1.0  0.0  0.0  0.0
0.0  0.0  0.0  0.0
```

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

\*\*\*\*\*

alpha = 1.000 column number = 4

1.0 0.0 0.0 1.0

0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0

1.0 0.0 0.0 1.0

\*\*\*\*\*

\*\*\*\*\*

The CONSENSUS MATRIX for alpha = 1.000 is :

0.000 0.000 0.250 1.000

0.000 0.000 0.000 0.000

0.250 0.000 0.000 0.250

1.000 0.000 0.250 0.000

for alpha = 0.000 K = 1.0000

for alpha = 0.250 K = 0.3912

for alpha = 0.500 K = 0.1636

for alpha = 0.750 K = 0.2325

for alpha = 1.000 K = 0.1875

Construct Consensus is 0.5876

This is the similarity matrix

0.0000 0.4738 0.7151 0.7928

0.4738 0.0000 0.3836 0.5322

0.7151 0.3836 0.0000 0.5262

0.7928 0.5322 0.5262 0.0000

This is the dissimilarity matrix

0.0000 0.5262 0.2849 0.2072

0.5262 0.0000 0.6164 0.4678

0.2849	0.6164	0.0000	0.4738
0.2072	0.4678	0.4738	0.0000

\*\*\*\*\* end of printout \*\*\*\*\*

## **APPENDIX III**

### **THE PILOT STUDY — ADDITIONAL CASE STUDIES**

Two further cases which formed part of the pilot study are reported in this appendix.

#### **Case A3.1: Tim and Evette**

##### **Introduction**

The first interview with Tim was conducted in the courtyard of his home on a balmy summer's evening in January. The overall tone of the interview was positive and optimistic. However, a view was formed that the level of optimism expressed by Tim and his willingness to surrender completely to his emerging role as a father was unrealistic. When asked about how he would alter his leisure pursuits when the baby was born Tim remarked that everything would be 'put on the back burner'. This response was a concern since it appeared to indicate an extreme reaction to the impending role of father. Employing the notion of violated expectations to the transition to parenthood Kalmus, Davidson and Cushman (1992) argued that:

It is not the nature of experiences alone which affect our evaluations of those experiences. Rather, the evaluations are shaped by how our experiences match our expectations (Kalmus, Davidson & Cushman 1992, p. 517).

It was portended that Tim's expectations of himself were such that if they were not met he may suffer significant stress.

After living together for twelve months Tim and Evette had married four months prior to the interview. From the comments made by Tim it appeared that the marriage was an accommodation to the desires of Evette's parents. Moreover, the differences in the educational attainments of Tim and Evette and their career trajectories was another concern which emerged during the first interview. Tim also drew strong contrasts between his own family of origin and Evette's. He alluded to other issues which pointed to potential sources of difficulty for him.

Biographical details for Tim and Evette are shown in Table A3.1 below.

**Table A3.1: Biographical Data for Tim and Evette**

Variable/Attribute	Tim	Evette
Age	28	25
Occupation	Retail sales	Advertising manager
Highest educational qualification	Year 12	Undergraduate degree
Job status	Non-managerial	Senior management

It may be seen from the above that there were significant differences between Tim and Stephen in a range of areas. These will be clarified as the presentation of this case proceeds.

Tim was interviewed again in December at which time his daughter was eight months old. In strong contrast to the first interview his mood was subdued. He conveyed to the researcher that his experience of the transition to fatherhood had been very difficult for him. He was disturbed by the dynamics that had arisen and challenged by the interactions which he had experienced with his wife's family since the birth of the baby. It was apparent that the transition to fatherhood had resulted in a lot of soul searching. It was difficult to ascertain whether relationship issues had compounded Tim's difficulties.

## Descriptions of Self and Ideal Self

At the first interview Tim responded to the question *Who am I?* as follows:

- Tim James Smith;
- Husband;
- Father ;
- Provider;
- Support provider.

It may be seen that with the exception of the first these descriptors are of roles. Thus, they are depersonalised. The role descriptors 'Provider' and 'Support provider' reflect Tim's sense of obligation as a father and as a husband. It may be inferred that Tim had internalised the role of father as he nominated it as a descriptor of the self. Only a few of the participants described themselves in this way prior to the birth of the baby.

Tim was asked to rank and rate himself on the words or phrases which described his ideal self. His responses are shown in Table A3.2

**Table A3.2: Tim's Descriptions of his Ideal Self**

Word/Phrase	Ranking	Rating
Successful	1	6
Good family life	2	6
Secure	3	4
Physically well	4	6
Confident	5	5
Supportive	6	3
Progressive	7	5
Highly regarded	8	3

Similarly to Stephen who had nominated 'successful at life' as the most salient attribute of his ideal self, Tim was motivated to be successful in his work role and in his family roles of husband and father. He ranked 'successful' first in terms of ideal self attributes and awarded himself a rating of 6.

In relation to his work Tim perceived himself as successful for a number of reasons. At the first interview he indicated that in his line of work achieving and exceeding sales targets was indicative of success. He had achieved the second highest year to date

sales at the store where he worked. His expectation was to be professional and to be well regarded by his 'coworkers, customers and management'. When asked to nominate his needs in relation to work he mentioned 'challenge, dollars, progression at work and achieving targets'. He also indicated that he liked to be 'competitive'. However, despite his achievements in sales Tim stated that there was no future in that line of work. For that reason he had embarked on a course of study in business management with a view to furthering his career. He indicated that he would like a 'middle management' job but had not resolved any specific career goals.

Tim made a number of significant disclosures about his own family life at the first and the second interview. He had regrets about his own family history and longed for the security and support of a loving family environment. He remarked that none of the members of his own family were particularly close and that they did not often contact or visit each other. Thus, it was not surprising that 'good family life' was the second ranked attribute of Tim's his ideal self description. He also awarded himself a rating of 6 on this attribute.

The third most salient ideal self attribute nominated by Tim was 'secure'. At the time of the first and the second interview he and Evette were living in rented accommodation. Whilst Tim expressed a desire to purchase his own home there was a sense from him that this not a realistic goal at least in the short term. He did not mention any specific goals in respect of purchasing a home. Since this was a sensitive matter it was not pursued any further.



## Work and Nonwork

Tables A3.3 shows the work related data reported by Tim.

**Table A3.3: Work Related Data for Tim**

Variable	First Interview	Second Interview
Years of work experience	10	
Time with current employer	1	
Time with previous employer <sup>(a)</sup>	1	
Hours of work per week	31-40	41-50
<i>Work at home</i>		
Evenings	No	No
Weekends	No	No
Work at the office on weekends	Yes	Yes
Job satisfaction	4	3
Occupational satisfaction	3	3
Organisational satisfaction	3	3
Job commitment	4	4
Occupational commitment	4	4
Organisational commitment	3	3

(a) Data reported in the first three rows were collected only at the first interview.

When first interviewed Tim was working five days per week. This included working on Saturdays three weekends per month. When the second interview was conducted Tim had altered his pattern of work considerably. He had increased his working hours and was working every weekend. At the first interview Tim had indicated that Evette would return to full-time work three months after the baby was born. However, when the second interview was conducted he indicated that she was working less than twenty hours per week. Thus, there appeared to be a need for Tim to work longer hours in order to ensure an adequate level of income.

At the first interview Tim reported a high level of job satisfaction. He was somewhat less satisfied with his occupation and the organisation for which he worked. Nevertheless he was highly committed to the job and his occupation. He was less committed to his employer. On the second occasion he reported identical levels of satisfaction and

commitment in relation to his job, occupation and the organisation with the exception that his level job satisfaction had diminished.

### Distinguishing Between Work and Nonwork

Tim reported that both work and nonwork are 'social environments, both require things to be achieved, sometimes things are not preferable'. Tim appeared by nature to be gregarious and outgoing. His engaging manner was suited to a sales role. Prior to working in sales he had managed a hotel. Thus, it was not surprising that he described work and nonwork as social environments. Tim described leisure as 'having the choice on how to use time'. The constraint on discretion was implied when Tim spoke about work and explicit when he described leisure.

### Household Work

The contribution to household work reported by Tim is shown in Table A3.4 below.

**Table A3.4: Tim's Contributions to Household Work**

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	1.5	3.0
Grocery shopping	2.5	2.5
Cleaning	3.0	4.5
Ironing	3.8	2.5
Cooking the evening meal	2.0	4.0
<i>Subscore</i>	12.8	16.5
<i>Traditional Masculine</i>		
Gardening	1.5	1.5
House maintenance	2.0	1.5
<i>Subscore</i>	3.5	3.0
<i>Androgynous</i>		
Budgeting	3.0	3.0
Paying bills	5.0	4.5
Negotiations with external agencies	1.5	1.5
<i>Subscore</i>	9.5	9.0
<i>Total Score<sup>(a)</sup></i>	25.8	25.9
Satisfaction with division of household work	4.0	4.0

(a) The maximum achievable total score was 57.5 made up of the subscore maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.0 for androgynous tasks.

Tim's contribution to household work was quite low. The profile and degree of his contribution was similar to Stephen's which reflected a division of labour along

traditional lines. As may be seen from the table that Tim's reported contribution to feminine tasks was less than half of the maximum achievable score on both occasions.

Tim's score on the AWS Spence and Helmreich (1978) was 38. In relation to item two on that scale which is *'under modern economic conditions with women being active outside the home, men should share in household tasks such as washing dishes and doing the laundry'* Tim's response was 'Agree Strongly'. However, whilst he strongly endorsed the sentiment there was no equivalence in terms of his contribution at home. Evette was not participating in the paid workforce at the time of the first interview. This may have been a reason for the low contribution reported by Tim. However, as mentioned when the second interview was conducted Evette was working twenty hours per week and engaged in part-time study. As may be seen from the data in Table A3.4 there was only a slight increase in Tim's contribution.

## **The Transition to Fatherhood**

### **Prospective View**

A strong sense of obligation but also resignation was communicated by Tim in his opening remarks about becoming a father. He said that becoming a father will not affect work, 'work has to go on'. Contrasting work with one of his leisure interests photography he said 'I need to work, I want to take pictures, one is going to have to give'. Tim said that he would have to put 'his personal wants on hold' after becoming a father. Thus, in these remarks an acute sense of the sacrifices required after the birth of the baby was conveyed. His remarks resonated with the comment made by him early in the course of the first interview about 'putting everything on the back burner'. Apart from these expectations of a reduction in his discretion Tim said that he had no other ideas about

what to expect except that his sleep would be affected and his energy levels reduced. Like Stephen, Tim voiced concerns about feeling remote from things during the course of the pregnancy. He characterised himself as a 'support person'.

Tim had polarised conceptions of the roles of mother and father. He said that the mother is the 'instinctive care provider, attentive' and the 'father is strong and steadfast, the head of the family'. However, he also said that the father should not lay down the law. There was a sense in this latter remark that he was articulating this anti-authoritarian view because of his experience of his own father but he did not elaborate upon it. Tim spoke of the protector role of the father when he said 'I am looked upon to keep people you want out to make things safe'. These themes of physical strength and that of the protector role were repeated during the course of the current research. They reflected personal perceptions about roles which are tied to the folklore of masculinity and femininity. However, in terms of masculine types Tim was not stereotypical. This was evident from his manner and from specific remarks he made about fathering. Tim said that it would be 'great to have a child that I love and that loves me'. Reflecting again on his own childhood he said that he would 'try to make situations easier to understand' than they had been for him. He said 'I want to improve on what happened to me, the baby will be in a much better position than I was growing up'. Tim said that he would like to be 'laid back approachable and easy to communicate with'. Thus, the period before the birth of the baby had for Tim brought many of the negative experiences of his childhood back into focus. During the course of the first interview he made no positive comments about his upbringing. All of his recollections none of which were prompted by the researcher were cast in a rather negative light.

Tim's strong desire for communion and love were not tied only to his prospective role.

He was asked to indicate what his needs were as a husband. His responses were:

- To be loved;
- To give love;
- Belonging;
- Providing;
- Regarded as the main provider;
- Considered;
- Consulted;
- Active role.

It may be seen that although his earlier self description was in terms of roles which conveyed a depersonalised view of self, further investigations revealed strong affiliative and instrumental needs. The first three descriptors above are indicative of the former. Descriptors four and five are clearly instrumental and indicative of a traditional conception of the husband as the provider. This is strongly indicated since Tim first annunciated the 'provider' descriptor but immediately qualified this by saying 'regarded as the main provider'. Descriptors six and seven reflected a conciliatory nature. This was not inconsistent with an impression formed of Tim.

In summary Tim's needs were to be loved but also to be capable of being the main provider for his family. However, there was an irony which was surmised by the researcher. Tim had by virtue of his marriage to Evette joined a family typified by mutuality and support as well as success in business. It seemed that those things which Tim desired were available but also a source of stress for him because of the expectations which accompanied them.

### **Retrospective View**

When asked to describe the changes which had occurred in his life since the birth of the baby Tim indicated that his priorities and lifestyle had changed. Like many participants he said that he had less free time and what he did had assumed increased importance. Tim was one of three participants in the research for whom the transition to fatherhood

had not been easy. There was strong evidence of this in another remark he made about the changes since the baby was born. Tim said that he :

had been pushed to further limits of effort, energy, love and attention. Been forced to re-examine self, self worth, priorities, goals and methods.

The use of words such as 'pushed' and 'limits' and the introspective tone demonstrated by the remarks about 'self-worth' in this extract were indicators of the difficulties with which Tim was grappling. Moreover, his body language, tone of voice and his less expansive style at the second interview were all indicators that things had been difficult for him.

### Descriptions of Self as a Father

Tim's descriptions of himself as a father are shown in Table A3.5.

Table A3.5: Tim's Descriptions of Self as a Father

Word/Phrase	Ranking	Rating
Carer	1	7
Partner/Friend	2	8
Provider	3	10
Protector	4	10
Advisor	5	3
Coordinator	6	4
Leader	7	0
Figurehead	8	0

Expressive qualities were the two most salient attributes of the role of father nominated by Tim. He felt that he was indicative of those as indicated by the ratings he awarded himself. Appearing third and fourth in the list were the role of protector and provider. The ratings on these indicated that Tim's behaviour at the time of the interview was strongly orientated towards expressing those attributes of the role of father. The attributes of leadership and of being the family figurehead were not salient for Tim nor did he appear to express them. This is indicated by their position in the hierarchy and the ratings which he awarded himself on them.

## Babycare

Tim's reported contributions to babycare is shown in Table A3.6.

**Table A3.6: Tim's Contributions to Babycare**

Task	Score <sup>(a)</sup>
Changing nappies	6.0
Bathing	0.0
Night tending	12.0
Play	5.0
Taking the baby for a stroll	2.0
Giving partner time alone	8.0
Total Score	33.0

(a) The maximum achievable score was 50.

Tim's overall contribution was typical of that reported by a number of other men who participated in the study. Whilst the participants indicated a strong identification with their parenting role this was not strongly correlated with their contributions towards care of the baby. Tim's significant contributions towards babycare were night tending which he reported doing every second night in the two week period prior to the second interview. He also reported that in the same period he had facilitated time alone for Evette every second day.

## Relationship Issues

### Relationship Characterisation and Salience

Table A3.7 shows how Tim characterised his relationship and the salience of roles.

**Table A3.7: Relationship and Role Salience Data for Tim**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	5	3
Friendship	7	7
Partnership	3	5
<i>Ranking of Roles</i>		
Career	3	3
Marriage	1	1
Family life	2	2
Leisure	4	4
<i>Role Salience Subscales<sup>(a)</sup></i>		
Career		39
Marriage		42
Parenting		49
Home		49

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

These data show that on both occasions friendship was the predominant way in which Tim characterised his relationship with Evette. It was not surprising that on the second occasion there was a decrease in his perception of the romantic aspect of his relationship and an increase in the partnership element as a consequence of the birth of the baby. The logistics are such that partnership becomes an important aspect of managing a young baby. The consistency with which Tim ranked his roles and the role salience data collected at the second interview bolstered the contention that marriage and family life were extremely important to him.

### Marital Satisfaction

Data on marital satisfaction are shown in Table A3.8 below.

**Table A3.8 : Tim's Marital Satisfaction Levels and Spouse Relations**

Marital Satisfaction Scale	First	Second
<i>Items</i>		
Miserable/Enjoyable <sup>(a)</sup>	7	7
Hopeful/Discouraging	7	6
Free/Tied Down	4	5
Empty/Full	7	7
Interesting/Boring	7	7
Rewarding/Disappointing	7	7
Doesn't Give Me Much Chance/Brings out the Best in Me	7	7
Lonely/Friendly	7	6
Hard/Easy	4	3
Worthwhile/Useless	7	7
Overall Satisfaction	6	6
Relationship with Spouse <sup>(b)</sup>		18

(a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.

(b) The maximum achievable individual score on this subscale was 35.

It may be seen that at the first interview Tim reported very high levels of satisfaction in all but two of the areas nominated. His ratings were not significantly different on the second occasion. His overall level of marital satisfaction was high on both occasions. The spouse relations subscore was not indicative of significant relationship difficulties.



## Parenting Stress and Related Measures

Tim's scores on the PSI are shown in Table A3.9 below.

**Table A3.9: Parenting Stress Measures for Tim**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	9
Child mood	5
Child adaptability	27
<i>Domain Score</i>	41
<i>Parent Characteristics Domain</i>	
Competence	25
Attachment	12
Restrictions	16
Isolation	14
Relationship with spouse	18
Parental health	12
<i>Domain Score</i>	97
Parenting Stress Index Score	138

Tim's overall score of 138 on the PSI was well below the benchmark of 182 which had been set as an indicator of significant difficulty in adjusting to the demands of parenthood. However, the scores reported on several of the subscales pointed to some of the difficulties which he had experienced. The scores on the parent reinforcement and the child adaptability subscales of 9 and 27 were in the vicinity of the benchmarks established which were 10 and 31 respectively. Similarly the scores recorded on the competence, attachment and isolation subscales of 25, 12 and 14 were also in the vicinity of the benchmarks of 31, 14 and 18. Thus it was inferred that some difficulties were experienced in relation to the reinforcement from the baby, but particularly in relation to the baby's adaptability. Tim's sense of competence as a parent was not high and he reported a sense of remoteness from the baby and isolation.

Other stress ratings reported by Tim are shown in Table A3.10 below.

**Table A3.10: Stress Ratings Reported by Tim**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	7
Stress as a result of becoming a father	6
Stress from work pressures	5
Relationship stress	5
Overall stress since the birth of the baby	4

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

Tim reported significant difficulty in the transition to fatherhood as evidenced by his rating of the item at its maximum of 7. Similarly he acknowledged significant stress in the role of father.

### **Summary of Tim and Evette's Case**

In summary, there was a marked change evident in Tim between the first and the second interview. At the first meeting Tim was extremely positive about all facets of his life. At the second he was subdued and there were indications that things had been difficult for him. His difficulties appeared to have been magnified by psychological pressures that were wide ranging and intense at the second meeting. By entering into the role of a father Tim had been confronted by his own childhood difficulties, and was clearly undergoing some personal struggles. At the same time he was coping with the day to day demands of the role.

Tim and Stephen contrasted with each other in a number of respects. Whilst they were of similar ages Stephen was more established in his career and had already renovated his first home. In contrast Tim had no established career and his employment pattern was diverse. He expressed a strong desire to move to his own home but he and Evette had not yet achieved that. Whilst both men had experienced difficulties during the transition to fatherhood those of Stephen were connected with the hands on job of

parenting. Tim had similar difficulties but was also wrestling with a number of personal issues. The next case reported contrasts markedly with Tim's and Stephen's.

### **Case A3.2: Victor and Jenny**

#### **Introduction**

During the first interview with Victor it became evident that he was quite different to all of the men who had been interviewed to date. What characterised him as different was his intensely competitive nature. There was evidence of this in his personal and professional life. In relation to his career Victor had a very clear idea of the path he would like to take and the steps which were necessary to remain in that path and achieve his goals. At the age of thirty-two he had already achieved middle management status and was pursuing a specialist masters degree to enhance his career opportunities. His ultimate goal was to secure a position as a management consultant which he described as 'the pinnacle of a career'.

In his personal life Victor also drove himself very hard. He was very conscious of fitness and personal appearance. He had set himself a goal of completing a triathlon. When asked to describe his expectations of himself in relation to his work he said: 'to set goals and do your best'. He voiced similar expectations in relation to his leisure activities. When asked to describe the similarities between work and nonwork life Victor said that 'both were hectic'. Work was different in that it was more formal and less relaxed. What differentiated leisure was 'the capacity to do what you want to do when you want to do it'. This connotation of discretionary choice was similar to that mooted by Tim when he spoke about his perception of leisure.

Victor said that the company with which he was employed was clear about what was expected of him. He also said that his wife Jenny 'understands what I want'. At the first interview Victor indicated that Jenny was not prepared to travel overseas and that this may limit his career opportunities. However, in a conversation subsequent to the second interview Jenny said that Victor had changed jobs and had managed to secure travel benefits for her and the baby. This meant that they could travel with him whenever he was required to undertake international travel.

Thus, it appeared that Victor's career goals had set the agenda for the family. Jenny was not employed in a professional capacity. This appeared to lessen the potential for conflict as a result of dual career pressures. A theme that emerged was that of mutual accommodation which worked well for each partner.

Table A3.11 shows biographical details about Victor and Jenny

**Table A3.11: Biographical Data for Victor and Jenny**

Variable/Attribute	Victor	Jenny
Age	32	35
Occupation	Financial Accountant	Sales Assistant
Highest Educational Qualification	Undergraduate degree	Year 10
Job Status	Middle management	Non managerial

### **Descriptions of Self and Ideal Self**

During the first interview Victor described himself as:

- Industrious;
- Strive for excellence;
- Perhaps obsessive.

These were honest and apt descriptions. They were reflective of what Victor manifested in his professional and personal life.

Table A3.12 shows how Victor depicted his ideal self.

**Table A3.12: Victor's Descriptions of his Ideal Self**

Word/Phrase	Ranking	Rating
Family oriented	1	8
Career-successful	2	7
Prosperous	3	7
Athletic	4	6
Well educated	5	8
Unstressed/relaxed	6	5

Given the emphasis which Victor had placed on his career goals and personal fitness it was initially surprising that he described the most salient aspect of his ideal self as 'family oriented' and that he rated himself at eight out of ten on this attribute. Other data pointed to him as being agentic rather than communal. For example he scored 28 and 17 respectively on the masculinity and femininity subscales of the Masculinity and Femininity Scale (Spence & Helmreich 1978). On the basis of these scores he was typed as masculine. Moreover, when asked during the first interview whether or not he perceived himself as masculine Victor responded 'yes'. He elaborated that he did not entertain 'weakness' or 'uncertainty' and that especially at work he wanted to be perceived as 'forceful' and 'competent'. However, other data will be reported which suggests that Victor had a dualistic conception of himself. In relation to his career and fitness training he was committed, competent, competitive and successful. The work environment and his fitness training were avenues for the expression of his masculine identity. In contrast his role as a father appeared to be a means of developing and expressing his communal capacities.

## Work and Nonwork

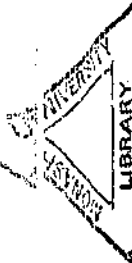
Work related data reported by Victor are shown in Table A3.13.

**Table A3.13: Work Related Data for Victor**

Variable	First Interview	Second Interview
Years of work experience	More than 10	
Time with current employer	1	
Time with previous employer <sup>(a)</sup>	6	
Hours of work per week	51-60	51-60
<i>Work at home</i>		
Evenings	No	No
Weekends	No	No
Work at the office on weekends	Yes	Yes
Job satisfaction	4	5
Occupational satisfaction	5	5
Organisational satisfaction	4	4
Job commitment	4	4
Occupational commitment	5	4
Organisational commitment	4	4

(a) Data reported in the first three rows were collected only at the first interview.

As may be seen Victor's hours of work were long. He reserved his time outside work for his studies and his training. However, he went to work every weekend before the baby was born. After the baby was born this pattern did not alter except that he went to work at his office three weekends per month. Victor reported high and consistent satisfaction and commitment levels to his job, career and the organisation for whom he worked.



## Household Work

Victor's reported contributions to household work is shown in Table A3.14.

Table A3.14: Victor's Contributions to Household Work

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	0.0	0.0
Grocery shopping	2.5	0.0
Clearing	3.0	0.0
Ironing	2.5	0.0
Cooking the evening meal	4.0	4.0
<i>Subscore</i>	12.0	4.0
<i>Traditional Masculine</i>		
Gardening	1.0	1.0
House maintenance	2.5	2.0
<i>Subscore</i>	3.5	3.0
<i>Androgynous</i>		
Budgeting	3.0	2.0
Paying bills	1.5	1.5
Negotiations with external agencies	1.5	1.5
<i>Subscore</i>	6.0	5.0
<i>Total Score<sup>(a)</sup></i>	21.5	12.0
Satisfaction with division of household work	5.0	2.0

(a) The maximum achievable total score was 57.5 made up of the subscore maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.0 for androgynous tasks.

At the first interview Victor achieved low scores for his contribution to household work. At the second interview his reported contribution had dropped to almost nil. At that time Jenny was not participating in paid work. Therefore, given the traditional nature of their relationship Victor's low contribution to feminine tasks was not surprising. However, as may be seen from Table A3.14 Victor reported a significantly lower level of satisfaction with the division of household work. He indicated that his work and studies had absorbed most of his time which made it difficult to make more contributions at home.

## The Transition to Fatherhood

### Prospective View

At the first interview Victor said that it was 'hard to imagine himself' as a father since there was no physical evidence, the baby was 'locked up inside my wife's stomach'. He indicated that becoming a father would affect his work life. His expectation was that he

would need to start work later and finish early. He expected that he would get less sleep and that this would affect his attention at work. He also envisaged that his relationship would deteriorate because of the demands of the baby. However, his long-term expectation was that a child would be an impetus to spend more time together and to be more involved with each other. He envisaged that this would be beneficial to his relationship with Jenny.

### **Retrospective View**

Victor was matter of fact about the changes which had occurred in his life since the birth of the baby. His response was that he had 'less free time' and 'more responsibilities'. There was no other elaboration. This was not a surprising response. Victor did not appear to be by nature a reflective nor expansive type of person. He was pragmatic.

### **Descriptions of Self as a Father**

Earlier it was suggested that Victor had a dualistic self concept. In contrast to his career fitness and interests which portrayed him as instrumental his descriptions of himself as a father were expressive. These descriptions are shown in Table A3.15.

**Table A3.15: Victor's Descriptions of Self as a Father**

Word/Phrase	Ranking	Rating
Love	1	8
Caring	2	8
Patience	3	6
Self disciplining	4	6
Commitment	5	7
Time conscious	6	6

The expressive attributes of love, caring and patience were most salient for Victor when he described himself as a father. In contrast to Stephen and Tim there was no mention of the provider role nor of himself as a protector.



## Babycare

Victor's self reported contributions to babycare is shown in Table A3.16.

**Table A3.16: Victor's Contributions to Babycare**

Task	Score <sup>(a)</sup>
Changing nappies	7.5
Bathing	6.0
Night tending	3.0
Play	5.0
Taking the baby for a stroll	3.0
Giving partner time alone	6.0
Total Score	30.5

(a) The maximum achievable score was 50.

It was apparent that whilst Victor had maintained his high level of working hours after the birth of the baby, continued with his studies, and reduced his contribution to household work, he had elected to make a significant contribution to caring for the baby. He indicated at the second interview that the time he devoted to fitness training had decreased such that he was conscious of his body lacking tone. This was of some concern to him since at the first interview he indicated that one of the motivations for doing regular exercise was to avoid the "middle age spread".

## Relationship Issues

### Relationship Characterisation and Salience

At the time of the first interview Victor and Jenny had been married for one year. Prior to that they had lived together for two and a half years. Table A3.17 shows relationship and role salience data reported by Victor.

**Table A3.17 Relationship and Role Salience Data for Victor**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	2	3
Friendship	6	3
Partnership	7	9
<i>Ranking of Roles</i>		
Career	1	2
Marriage	3	3
Family life	2	1
Leisure	4	4
<i>Role Salience Subscales<sup>(a)</sup></i>		
Career		33
Marriage		41
Parenting		44
Home		41

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

The idea of partnership emerged as the dominant element in the relationship between Victor and Jenny, at least from Victor's perspective. Career and family life were the top two ranked roles at the first interview. However, career had diminished in salience by the time the second interview was conducted. In terms of role salience scores Victor recorded similar scores across the roles of marriage, parenting and home. It has been argued that the relative salience of roles will determine the investment that an individual makes in them (Lobel 1991, p. 514). Thus, if a number of roles are equally salient or nearly so then conflict associated with trying to manage the investment in those roles may arise. This may be why when describing his life Victor said that it was 'hectic'

## Marital Satisfaction

Marital satisfaction data reported by Victor are shown in Table A3.18 below.

**Table A3.18 : Victor's Marital Satisfaction Levels and Spouse Relations**

Marital Satisfaction Scale	First	Second
<i>Items</i>		
Miserable/Enjoyable <sup>(a)</sup>	6	6
Hopeful/Discouraging	6	6
Free/Tied Down	6	6
Empty/Full	6	6
Interesting/Boring	6	6
Rewarding/Disappointing	6	6
Doesn't Give Me Much Chance/Brings out the Best in Me	6	6
Lonely/Friendly	5	5
Hard/Easy	6	6
Worthwhile/Useless	6	6
Overall Satisfaction	6	6
Relationship with Spouse <sup>(b)</sup>		15

(a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.

(b) The maximum achievable individual score on this subscale was 35.

It may be seen that Victor's ratings on each of the items were high and almost invariant between the first and second interview. Similarly the spouse relations score was low indicating low stress in his relationship with Jenny.

## Parenting Stress and Related Measures

Parenting stress and other reports of stress during the transition to parenthood are shown in Tables A3.19 and A3.20.

**Table A3.19: Parenting Stress Measures for Victor**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	5
Child mood	5
Child adaptability	22
<i>Domain Score</i>	32
<i>Parent Characteristics Domain</i>	
Competence	23
Attachment	10
Restrictions	19
Isolation	13
Relationship with spouse	15
Parental health	16
<i>Domain Score</i>	96
<b>Parenting Stress Index Score</b>	<b>128</b>

Victor's low score on the Parenting Stress Index led the researcher to question whether it may have been a false negative. However, there were strong indications from Victor and Jenny were a well-knit team. Each of them knew their role and what to expect in return for carrying it out. Whilst their relationship was quite traditional it worked well for them. When the interviews were being conducted there was never any indication of undue stress in the household. The mood was one of order and stability. Thus, the low score on the Parenting Stress Index appeared to be a reflection of a very smooth transition to parenthood. A further contact was made with Victor and Jenny to clarify an issue that had arisen in collating the data for their case. It was clear from the discussion that things had continued to run smoothly and that Jenny and Victor were happy with their overall style of life. There was no hint of any difficulties.

Other stress ratings reported by Victor are shown below.

**Table A3.20: Stress Ratings Reported by Victor**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	3
Stress as a result of becoming a father	4
Stress from work pressures	5
Relationship stress	3
Overall stress since the birth of the baby	5

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

Victor reported moderately high levels of work stress and overall stress after the birth of the baby. It appeared that the source of his stress was work pressures and the additional responsibilities and time pressure which his role as a father had placed on him.

### **Summary of Victor and Jenny's Case**

The principal impression of Victor was of a man with a competitive nature. He had clear career goals and drove himself hard in his professional and personal life, particularly in regard to his triathlon training. Victor's intensity can be understood when one relates it to his family background. He indicated that there had been financial difficulties in his family and that this had required him to be independent and resourceful from an early age. He said that he tended to be 'unemotional, insular' and that he had a tendency to 'bottle things up'. This is how he presented when interviewed for the current research. Victor described running as 'a release from everything, you are in your own little world'. He said that running was almost an indulgence but that it helped him to disengage psychologically from work and was therefore therapeutic for him.

In summary, Victor's career ambitions appeared to be at the forefront. Becoming a father had not altered his drive to be very successful in his career. His wife Jenny had agreed to this pattern of life, and as a consequence their relationship and family life worked very well.

## APPENDIX IV

### STATISTICAL ANALYSIS OF QUESTIONNAIRE DATA

#### Introduction

In this appendix the questionnaire data and the results of statistical tests conducted on that data are reported. The sample size is 22. As described previously ethical constraints precluded the collection of full data from the partners of participants. Thus, only limited biographical data collected from participants about their partners are reported here. Where data are common to both partners it is reported only under the participant in the relevant tables.

The appendix is presented in three sections. Section 1 profiles the participant group in relation to age and marital status. Also reported are age at first marriage and the age at which participants and their partners became parents. These data are examined in relation to the occupational status of participants and their partners. Data concerning the educational attainments of participants and partners are also reported.

Section 2 presents data about paid work and contributions to unpaid work reported by participants. The type classifications of masculine which is instrumental, feminine which is expressive and androgynous which is hallmarked by a mix of masculine and feminine characteristics are a theme of this section. Implicit in the identification of this latter characteristic is the rejection of the *bipolar* conception of masculine and feminine

attributes first proffered by Spence and Helmreich (1978) and defined by Piel (1985, p. 20) as 'the possession of masculine and feminine characteristics simultaneously by a given person'. Analyses are reported on the contributions of participants to unpaid work according to their type classification.

In the current research participants were asked to provide free response descriptions of themselves, their ideal selves and themselves as fathers. These descriptions and the relationships between them are reported in section three. Also reported in section three are role salience data collected at each interview and satisfaction measures related to work and nonwork. Parenting stress and other indicators of the experience of the transition to fatherhood form the latter part of section three.

### **Hypothesis Testing**

Hypothesis tests for the difference between means are in the main tests for matched pairs. Such is the case when comparisons have been made between participants and their partners in respect of their ages and levels of education. In most instances the status of *participant couple* justified the matched pairs approach (Norusis 1988, p. 227). Similarly the longitudinal data such as that concerned with working hours, marital satisfaction and contributions to unpaid household work has been tested with a matched pairs design since the same participants were reporting data on two separate occasions

The specific type of test used in each instance was decided after weighing up considerations about the level of measurement of the underlying data, the assumptions that various tests make about the populations under consideration and the power efficiency of tests. Thus in some instances parametric tests such as the *t* test were used. Consideration was given to the implications when the two principal assumptions

concerning the use of the  $t$  test were violated. The  $t$  test is *robust* when the assumption of normality for the variable under consideration is not exactly met. Thus, this did not inhibit the use of the test. For tests involving independent means, an assumption regarding the use of the  $t$  test is that the population variances are equal. This assumption can be ignored when the sample sizes are equal or if the larger sample is not more than 1.5 times greater than the smaller (Welkowitz, Ewen & Cohen 1976, pp. 144-5). These criteria were not always met in the current research. Thus, Levene's test for equal variances was used as a preliminary screening test. When the null hypothesis under Levene's test could not be supported the more conservative  $t$  score consequent upon the reduced degrees of freedom was used. When more than two groups were involved Analysis of Variance (ANOVA) was used rather than  $t$  tests in order to avoid the '*multiple comparisons problem*' where 'when multiple comparisons are made the probability of finding at least one significant [*sic*] difference by chance increases' (Kaplan 1987, pp. 170-71).

When the level of measurement did not warrant parametric tests, nonparametric tests were used. For example the sign test was used as a substitute for the  $t$  test. It was recognised that such tests are somewhat less efficient such that for a given level of significance the probability of accepting a false null hypothesis is increased. However despite the lesser efficiency of nonparametric tests, they are not as restrictive in terms of the assumptions they make (Hamburg 1983, pp. 541-2).

A standard protocol has been adopted such that the null and research hypotheses are stated, and the *observed significance* is rated against benchmarks of .05 and .01. It is understood that a failure to reject a null hypothesis does not constitute an acceptance of it as true (Norusis 1988, p. 206). It is recognised and accepted that the non-random



nature of the sample and the small sample size preclude any generalisations to wider populations. However, the tests results reported here were instructive in terms of the research since they facilitated the comparison of aggregated results over time. They also served as a backdrop against which individual case studies could be examined. They provide a basis for the design and execution of larger studies from which generalisations could be made.

### A Profile of the Participant Couples

Table A4.1 below shows data concerning the age and marital status of participant couples.

Table A4.1: Age and Marital Status of Participant Couples

Item	Participants		Partners	
	Number	Per cent	Number	Per cent
Age (Years)				
<30	4	18.2	8	36.4
30 to 34	9	40.9	9	40.9
35 to 39	7	31.8	5	22.7
>40	2	9.1	0	00.0
Marital Status				
Married	20	90.9		
Cohabiting <sup>(a)</sup>	2	9.1		
Age at First Marriage				
< 25	2	9.1	5	22.7
25 to 29	9	40.9	10	45.5
30 to 34	6	27.3	4	18.2
35 to 39	4	18.2	3	13.6
>39	1	4.5	0	00.0
Cohabited Prior to Marriage				
Yes	14	63.6		
No	8	36.4		
Duration of Cohabitation <sup>(b)</sup>				
< 2	11	50.0		
2 to 5	9	40.9		
> 5	2	9.1		
Duration of Marriage				
<2	9	40.9		
2 to 5	8	36.4		
> 5	5	22.7		
Relationship Duration <sup>(c)</sup>				
<2	4	18.2		
2 to 5	9	40.9		
> 5	9	40.9		

(a) Following Sarantakos (1991, pp. 146-7) the term *cohabiting* is used here as an omnibus for three types of cohabitation which are:

- trial cohabitation under which the assumption is that marriage will ensue;
- liberal cohabitation under which the assumption is that cohabitation represents a rejection of marriage as an institution; and
- defacto cohabitation under which marriage is valued and respected but marriage does not ensue for practical, legal or economic reasons.

(b) All duration data are measured in years.

(c) Relationship duration is the sum of years of cohabitation and years married.

### **Age at First Marriage**

In 1940 the median age at first marriage in Australia was 26.5 for bridegrooms and 23.7 for brides. The post-war boom and a climate of economic security were factors that contributed to a drop in the age at first marriage and early family formation such that the median age at first marriage in 1974 was 23.3 for bridegrooms and 20.9 for brides. However from 1974 onwards the median age at first marriage rose, in part due to a reassessment of social roles and the increasing strength of the women's movement. Increasing numbers of women were pursuing further education and career training which led to the postponement of marriage. By 1995 the median age at first marriage had risen to 27.3 for bridegrooms and 25.3 for brides. In Victoria the statistics were similar, the median age at first marriage was 27.4 and 25.7 for bridegrooms and brides respectively. In 1974 35% of bridegrooms and 39% of brides were aged within one year of their medians. By 1995 each of these proportions had fallen by ten percentage points. Thus, the variation around the median age at first marriage had increased over time. In 1995 approximately two thirds of first marriages involved a bridegroom who was older than the bride whilst in 20% of cases the bride was older than the bridegroom. In contrast in 1974 only 11% of first marriages involved a bridegroom marrying an older bride (ABS 1997, pp. 25-9).

The data reported in Table A4.1 are indicative of the trend towards marriage at a later age. In the current research the median age of partners at first marriage was 29.5 for males and 27.5 for females. When the participant group was partitioned into three subgroups on the basis of occupational status the following patterns were uncovered. In the case of the five participants who were not professional it was observed that in every case neither were their partners. The median age at first marriage for this subgroup was 27.0 for males and 24.7 for females. In relation to the other 17 participants it was found

that 12 of them had partners who were also professionals. For that group the median age at first marriage was 30.5 for males and 28.5 for females. For the remaining 5 couples it was found that in all cases the participant was a professional and the partner was not. The median age at first marriage for this subgroup was 30.8 and 31.0 for the participant and partner respectively. In two of these cases the participant was younger than the partner.

Hypothesis tests were conducted to determine if there were significant age differences at first marriage between participants and their partners. Four separate hypotheses were tested, one for the participant group as a whole and one for each of three subgroups according to their occupational characteristics. These hypotheses are shown below.

1.  $H_0$  : The mean age of participants at first marriage was equal to that of their partners.

$H_1$  : The mean age of participants at first marriage was unequal to that of their partners.

2.  $H_0$  : For couples in which both partners were non-professionals the mean age at first marriage of participants was equal to that of their partners.

$H_1$  : For couples in which both partners were non-professionals the mean age at first marriage of participants was unequal to that of their partners.

3.  $H_0$  : The mean age of participants at first marriage in couples in which one member was a professional was equal to that of their partners.

$H_1$  : The mean age of participants at first marriage in couples in which one member was a professional was unequal to that of their partners.

4.  $H_0$  : The mean age of participants at first marriage in couples in which both members were professionals was equal to that of their partners.

$H_1$  : The mean age of participants at first marriage in couples in which both members were professionals was unequal to that of their partners.

The hypotheses shown above are non-directional. Whilst directional hypotheses make it is easier to reject a null hypothesis if the results are in the predicated direction, they also eliminate the chances of finding a significant difference in the opposite direction (Kaplan 1987, p.156). As reported above recent statistics have shown an increase in the proportion of first marriages in which the bride is older than the bridegroom. Thus, in terms of a choice between a one-tailed or two-tailed approach it appeared that two-tailed hypotheses were appropriate.

The relevant statistics pertaining to the tests are shown in Table A4.2 below.

**Table A4.2: Age Differences Between Participants and Partners at First Marriage**

Group/Subgroup <sup>(a)</sup>	M	SD	t	p <sup>(b)</sup>
<b>Group</b>				
Participant	29.87	4.38		
Partner	27.91	4.77	3.09	0.00 <sup>1**</sup>
<b>Subgroup 1</b>				
Both non-professionals				
Participant	27.03	2.04		
Partner	29.40	1.70	3.14	0.04 <sup>2*</sup>
<b>Subgroup 2</b>				
One member professional				
Participant	28.50	3.37		
Partner	30.10	4.29	-1.73	0.16 <sup>3</sup>
<b>Subgroup 3</b>				
Both Professionals				
Participant	31.62	4.80		
Partner	28.71	5.02	4.16	0.00 <sup>4**</sup>

(a) The sample sizes were  $n = 22$ ,  $n = 5$ ,  $n = 5$  and  $n = 12$  for the participant group and subgroups 1, 2 and three respectively.

(b) The relevant hypothesis number is shown as a superscript next to each reported  $p$  value. This form of notation is used throughout this chapter. Significance is shown as \*  $p < .05$ , \*\*  $p < .01$ .

In relation to age at first marriage it may be seen that at the level of the participant group and for subgroups one and three there was support for the contention that participants were significantly older than their partners. However, the results in the table also suggested that age at first marriage could have been related to occupational status. It may be seen that the participants and their partners in subgroup one (the group in which neither member of each couple was a professional) were younger than the participants and their partners in subgroup three (the group in which each member of each couple was a professional). Thus whilst as a group the participants in this

research reflected the trend towards the postponement of marriage, professional couples appeared to have married later. Since it appeared that occupational status may have been implicated in the age at first marriage another hypothesis was tested. This is shown below.

5.  $H_0$  : For participants and partners in the study the mean age of professionals was less than or equal to the mean non-professionals.

$H_1$  : For participants and partners in the study the mean professionals was greater than the mean age of non-professionals.

The data were recast such that professionals were in one subgroup and non-professionals in another and the mean age at first marriage calculated for each. The results are shown in Table A4.3.

**Table A4.3: Mean Age at First Marriage by Occupational Status**

Subgroup <sup>(a)</sup>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Professional	29.88	4.78		
Non-professional	26.99	3.78	2.03	0.02 <sup>5**</sup>

(a) The sample sizes were  $n = 29$  and  $n = 15$  for the professional and non-professional subgroups.

These results show that a significant age difference was observed between professionals and those who were non-professionals irrespective of sex. It was not surprising that the mean age of professionals at first marriage was higher than the mean age of non-professionals. The time taken to complete tertiary education and additional professional training may disincline one to marry early. Thus occupational status may be a moderating variable in age at first marriage. Enquiries made to the ABS indicated that data pertaining to age at first marriage by occupational status was not readily available. Thus, the issue was not pursued further.

### **Cohabitation and Marriage**

In 1989 a national survey found that almost 50% of adult Australians favoured people living together prior to marriage (Australian Institute of Family Studies 1997, p.15). In

1992 56% of Australian couples who married in that year had cohabited before their current marriage compared with 16% in 1975 (ABS 1997, p. 28). Similarly the 1995, Australian Family Values Survey, a national survey Australian adults ( $n = 2116$ ) found among other things that:

- The majority of adults agreed that it was acceptable to live together without the intention to marry;
- Slightly less than half believed that it was acceptable to have children out of wedlock;
- The law should not distinguish between formal and informal marriages (Australian Institute of Family Studies 1997, p.16).

Sarantakos (1994) reported that trend studies conducted by her in Australia and overseas in the period 1968 to 1990 showed an increasing acceptance of cohabitation as a means of expressing 'dissatisfaction with and liberation from traditional cultural constraints, particularly regarding sexist, discriminating and oppressive family structures' (Sarantakos 1994, p. 149). The proportion of respondents who reported this increased from 43% in 1968 to 69% in 1990. The proportion of respondents who felt that cohabitation was not liberating in any way remained relatively unchanged at around 22% whilst the proportion of those who expressed no view declined considerably from 33% in 1968 to 9% in 1990. Whilst the earliest of the three studies reported by Sarantakos was conducted in Munich the results of the Australian studies also demonstrated a significant acceptance of cohabitation as a liberating experience. In these studies the proportion who reported cohabitation as a liberating experience increased from 64% in 1978 to 69% in 1990. Australians became more definitive about their feelings as indicated by the decrease in the proportion who expressed ambivalence from 13% in 1978 to 9% in 1990. Reporting the results of a three stage study of 330 cohabiting couples in the period 1970 to 1990 Sarantakos (1994, p.151) reported that 17% of respondents indicated a preference for cohabitation on ideological

grounds. These couples were labeled 'liberal cohabitants'. By the third phase of the study 84% of the original cohabiting couples had abandoned cohabitation and married either their partner or another person. Only 9% of the original cohabitants were still together by the third stage of the study. Moreover, Sarantakos (1991, p.147) reported whilst 255 or 77% of the cohabitation units were dissolved by the second stage of the study in terms of the 510 individuals only 48% had married their former cohabitant. Thus, there appeared to be some factor(s) operating which disincline people from formalising a relationship with a cohabitant. Recent research has uncovered plausible reasons for this.

Cohabitation may be viewed as a distinct institutional form characterised by looser bonds and different goals, norms and behaviours. Partner selection is influenced by the type of relationship sought, and results in different patterns of partner choice. Persons who marry are generally homogamous on a wide range of characteristics. In this connection kinship issues such as religion and ethnicity are very important selection criteria since marriage 'embeds a couple and their children in a kinship network'. In traditional marriage and to a lesser extent in contemporary marriages women emphasise economic characteristics in men and men emphasise noneconomic characteristics in women. A particular phenomenon is that women 'marry up' with regard to education. In contrast cohabiting couples are more likely to emphasise achieved statuses such as education and labour force participation (Schoen & Weinick 1993, p. 409).

In a sample of couples drawn from a national probability sample Schoen and Weinick (1993, p. 411) found that :

- The propensity to marry is greater than the propensity to cohabit;
- Cohabiting couples are more homogamous with respect to education and less homogamous with respect to age and religion;
- Women are more inclined to marry up with regard to education.

Whilst cohabitation may be a prelude to marriage (Brown & Booth 1996, p. 671), the diversity among cohabitants on ascribed characteristics such as age and religion may explain why in the Sarantakos study (1991) only 48% of cohabitants subsequently married their partner. However no firm conclusions can be drawn since data on ascribed characteristics and achieved statuses, were not presented by Sarantakos (1991). It did not appear to be an objective of the research to control for such, since diversity of backgrounds and ideology was a feature of the sample (Sarantakos 1991, p. 145).

The results in Table A4.1 show that in the current research twelve of the participants or 60% had cohabited with their partner prior to marriage, a similar percentage to that reported by the ABS (1997, p. 29) which was 56%. The median duration of cohabitation prior to marriage estimated from the self-report data was one year. This adds some credence to the view that a relatively short period of unmarried cohabitation may be considered as an 'enriched engagement' (Sarantakos 1994, p. 157). Brown and Booth (1996, pp. 675-6) reported findings of an inverse relationship between the duration of cohabitation and plans to marry. The rationale behind these findings was that those with the intention to marry their partner exit cohabitation relatively early via marriage.

From the results reported in Table A4.1 it may be seen that in the current research marriage was the preferred form of partnership. Twenty of the twenty-two participant couples were married. The two who were not represented 9% of the sample a figure for



cohabitation similar to that reported by the Australian Institute of Family Studies (1997, p.13) which was 8%. The participants who were cohabiting appeared to have different perceptions of their relationships. The participant in one of those couples made a point of indicating on the first questionnaire that his was a de facto relationship. It was deduced from comments he made around various issues that he wanted to be seen as progressive rather than conservative. This intent may have been exaggerated because people in his profession, which was chartered accounting, are commonly portrayed as being staid and boring. However, there was also a sense from him that his relationship was testy. This undertone of relationship stress was more in evidence at the second interview. With this in mind it was also speculated that for this participant the de facto status of his relationship would mitigate difficulties associated with dissolving the partnership if such a contingency were to arise. Sarantakos (1994, p.150) reported that one of the attractive features of cohabitation often quoted in her studies was the liberation from formality when entering and leaving a relationship. However, the legal ramifications of cohabitation are now such that dissolution of a relationship can in some respects be as problematic as a divorce.

The other participant who was living in cohabitation was markedly different. He appeared to make no distinction between marriage and cohabitation. He referred to his partner as his wife and to her mother as his mother-in-law. He remarked at one point 'my wife or whatever you want to call it' when a relationship issue was being canvassed. He was not being flippant but expressing a seamless perception of cohabitation and marriage at least in relation to his own situation. He was a progressive person but also one who appeared to have internalised cohabitation as marriage.

Efforts were directed at uncovering factor(s) that may have explained why eight of the twenty married couples did not cohabit prior to marriage. An examination of the relevant data in terms of age, educational and occupational status indicated that as a subgroup they did not appear to be different from that subgroup in which the couples had chosen to cohabit. As individuals and as couples they were as mixed in terms of these characteristics as those individuals and couples in the subgroup where cohabitation prior to marriage had occurred. Thus, other possible bases of explanation were sought. Four of the participant couples were devout Christians. Thus, their religious beliefs may have precluded them from cohabiting prior to marriage. Two of the participants had married women who were from ethnic backgrounds where traditional values mitigate against cohabitation prior to marriage. In relation to the two remaining couples no reason can be proffered.

### **Marrying Up**

The sample data collected in the current research included data relating to the educational status of both participants and partners. Table A4.4 below shows the level of education achieved by each member of each couple and indicates the differences between them.

Table A4.4: Educational Attainments of Participants and Partners

Couple	Partner	Participant	Difference
1	5	5	0
2	5	6	(1) <sup>(a)</sup>
3	5	3	2
4	1	5	(4)
5	5	5	0
6	2	4	(2)
7	4	6	(2)
8	6	7	(1)
9	5	5	0
10	5	5	0
11	5	5	0
12	3	7	(4)
13 <sup>(b)</sup>	6	6	0
14*	5	5	0
15	5	6	(1)
16	4	5	(1)
17	5	6	(1)
18	6	5	1
19	5	6	(1)
20	1	3	(2)
21	3	1	2
22	2	5	(3)

(a) Entries in parentheses signify couples in which the participant had achieved a higher level of educational than his partner.

(b) An \* signifies couples who were cohabiting.

Key to Table

1. Completed Year 10 or equivalent
2. Completed Year 11 or equivalent
3. Completed Year 12 or equivalent
4. Completed trade or TAFE qualification
5. Completed undergraduate degree
6. Completed honors degree
7. Completed masters degree

The table shows that in 12 of the couples female partners had a lower educational status than their partner. An equivalent level of educational attainment is reported for 7 couples. Only in 3 cases did the educational status of the female partner exceed that of the male. Thus there was some evidence for the contention that women 'marry up'. The following hypothesis was tested.

6.  $H_0$  : Participants and partners in married couples will have an equal educational status.

$H_1$  : Partners in married couples will have a lower educational status than participants.

In conducting the test, data pertaining to educational status for the two couples that were cohabiting was omitted. It may be noted that they had achieved equivalent levels of tertiary education. This was suggestive of the homogamy between cohabiting couples observed in research reported above.

The results of a *Wilcoxon test* ( $Z = -2.08$ ,  $p = .02^*$ ) supported the research hypothesis. However, it may be seen that twelve partners had tertiary qualifications and of these two had achieved honours degrees. Thus, the results do not warrant an interpretation that the educational level of participants and their partners were polarised such that participants were highly educated relative to their partners. The general level of education of the participant group was quite high.

### **The Transition to Parenthood**

In age graded societies recognised norms exist for the performance of most social roles particularly the ordering and timing of role transitions. Thus there is a notion of 'social time' (LaRossa, 1983) and what constitutes "on-time" and "off-time" behaviour (Cowan 1988, p. 22). Traditionally the transition to parenthood has been "on-time" but also coincident with increasing career demands and financial exigencies. This convergence across institutional domains may create problems for role performance particularly for men who are considered to be the breadwinner but who are also under social pressure to devote more time to parenting. Men who defer parenthood until their initial career

goals are met may have more time and energy to function as both successful provider and active parent (Cooney, Pedersen, Indelicato & Palkovitz 1993, p. 206).

In keeping with the trend towards delayed marriage men and women in Australia are also delaying parenthood. The median age of mothers at first birth in a registered marriage increased from 26.3 in 1985 to 28.6 in 1995. The percentage of all births to mothers aged over 35 also increased dramatically in the same period from 7.5% to 13.7% (ABS 1997, p. 24). Enquiries were made of the ABS to determine if statistics relating to age of fathers at first birth were available but such data was not available. Therefore, a method used by (Cooney, Pedersen, Indelicato and Palkovitz, (1993, p. 206) was employed to estimate the median age of fathers at first birth. Published estimates for the period 1985 to 1995 show that the median difference in median ages at first marriage between men and women was 2.1 years (ABS 1997, p. 24). This figure was added to the median age of mothers at first birth in 1995. The estimate of the median age of fathers at first birth is therefore 30.7 years.

Table A4.5 below shows data on the ages of participants and partners in the aggregate and by subgroup at the first interview. Since it was shown earlier that partners were significantly younger than participants, formal hypotheses are not repeated here. However, indicative *t* statistics and *p* values are reported.

**Table A4.5: Ages of Participants and Partners at First Interview**

Group/Subgroup <sup>(a)</sup>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Group				
Participants	33.23	4.29		
Partners	31.27	4.01	3.09	0.00**
Subgroup 1. Both non-professionals				
Participants	29.60	2.88		
Partners	26.40	1.14	3.14	0.02*
Subgroup 2. Both Professionals				
Participants	35.67	3.75		
Partners	32.80	3.77	4.16	0.00**

(a) The sample sizes were *n* = 22 , *n* = 5 , and *n* = 12 for the participant group and the subgroups.

These results show that the group as a whole was indicative of the trend towards delayed parenthood. For the group and in both subgroups the partners were younger than the participants. This was again suggestive of the biological imperative that is more critical for women than men. However, it may be seen that when the subgroup of couples in which both partners were professionals was excised from the sample there was a difference in ages for both participants and partners relative to the non-professional subgroup. Professional couples were older when their first child was born.

Cooney, Pedersen, Indelicato and Palkovitz (1993, p. 208) designated those who became fathers at twenty-three or earlier as "early", those who became fathers between the ages of twenty-four and twenty-nine as "on-time" and those who became fathers at age thirty and above as "late". Since these benchmarks resembled the contemporary experience in Australia they were used to classify the couples in the current research. Table A4.6 shows the results of partitioning the sample in this way. Since there were no "early" fathers among the participants only two subgroups are shown.

**Table A4.6: Age of On-Time and Late Fathers and Partners**

Subgroup <sup>(a)</sup>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Subgroup 1. On-time fathers				
Participants	27.25	0.96		
Partners	27.00	2.16	0.17	0.44
Subgroup 2. Late fathers				
Participants	34.56	3.50		
Partners	32.22	3.72	3.40	0.00

(a) The subgroup sizes were  $n = 4$  and  $n = 18$  for the on-time and late fathers respectively.

For late fathers these results again showed significant age differences, partners were younger than participants. Whilst this was not evident for on-time fathers and their partners no reasons are proffered as the sub-sample was very small. Among the subgroup of on-time fathers only one participant was a professional and all partners were non-professionals.

Among the late fathers there were two participants who were non-professionals. The partners of these two participants were also non-professionals. Every other participant in this subgroup was a professional. Four of them had partners who were non-professionals. Thus the typical participant in the current research was a professional male in his mid-thirties, married to a professional female also in her thirties but about two years younger.

Cooney, Pedersen, Indelicato and Palkovitz (1993) found that late fathers were more involved with their children than on-time fathers. This higher level of involvement was attributed to higher levels of education such that there may be greater awareness of the value of extensive involvement with children, but also cognisance of the pressure to be involved so as to indicate a 'more egalitarian relationship'. However, Cooney, Pedersen, Indelicato and Palkovitz (1993) also reported that educational level was negatively related to paternal affect such that 'educated men often feel less positive about their paternal role' (Cooney, Pedersen, Indelicato & Palkovitz 1993, pp. 212-13). This may be due to the competing pressures of career and expectations felt about being an involved parent. In the current research only one of the on-time fathers had achieved tertiary education. In contrast all but one of the late fathers had achieved an undergraduate qualification. Six of these participants had achieved honours level qualifications and two had masters degrees. Thus, on-time and late fathers who participated in the current research had educational profiles similar to those who participated in the study by Cooney, Pedersen, Indelicato and Palkovitz (1993).

Since there appeared to be some rationale in identifying fathers as on-time or late the results in the next section are reported separately for each of these subgroups even though in respect of on-time fathers the subgroup is small.

### **Paid and Unpaid Work for On-Time and Late Fathers**

Data relating to paid and unpaid work were extracted and analysed for on-time and late fathers. Two sets of hypotheses were tested. The first was directed at assessing the levels and changes, if any, in patterns of involvement in paid and unpaid work between the first and second interview for on-time and late fathers. Thus the hypotheses tests conducted were for matched pairs. These hypotheses are shown below.

#### **Paid Work**

7.  $H_0$  : The mean working hours of on-time fathers will not change after the birth of the first child.  
 $H_1$  : The mean working hours of on-time fathers will change after the birth of the first child.
8.  $H_0$  : The mean working hours of late fathers will not change after the birth of the first child.  
 $H_1$  : The mean working hours of late fathers will change after the birth of the first child.

Whilst men may be delaying the transition to fatherhood it can coincide with their attempt to solidify their career for the sake of the family's security (Levinson, 1978). 'Economic provision has always been the *'sin qua non'* of the paternal role' (Lamb, Pleck, & Levine 1987, p. 119). Apart from the rather noble tone in the first remark, these statements failed to acknowledge relationships where there is joint responsibility for economic security, and those in which the female partner may be the 'breadwinner'. However couples can revert to traditional roles after the birth of the first child, such that the father assumes primary responsibility for breadwinning whilst the mother increases her involvement with household tasks at least in the short term (MacDermid, Huston & McHale 1990, p. 475). Barkley (1993, p. 147) observed that new fathers 'expressed a



fathers 'expressed a desire to be more involved at home but felt that they were limited by their involvement in work (outside the home)'. Ross (1994, pp. 54-5) argued that the birth of the first child can affect men in different ways.

Some men may run away from their families into a more stereotypical manly work identity. Thus, several of the fathers described working harder and harder after the children were born ... Others retreated from work, absorbing themselves in the family instead.

These examples demonstrate that it was difficult to speculate about the direction of change in relation to paid and unpaid work after the birth of the baby. Thus, the research hypotheses above are two-tailed.

### Unpaid Work

9.  $H_0$  : The mean contribution by on-time fathers to unpaid work that is feminine will not change after the birth of the first child.

$H_1$  : The mean contribution by on-time fathers to unpaid work that is feminine will fall after the birth of the first child.

10.  $H_0$  : The mean contribution by late fathers to unpaid work that is feminine will not change after the birth of the first child.

$H_1$  : The mean contribution by late fathers to unpaid work that is feminine will fall after the birth of the first child.

11.  $H_0$  : The mean level of responsibility of on-time fathers for unpaid work that is masculine will not change after the birth of the first child.

$H_1$  : The mean level of responsibility of on-time fathers for unpaid work that is masculine will increase after the birth of the first child.

12.  $H_0$  : The mean level of responsibility of late fathers for unpaid work that is masculine will not change after the birth of the first child.

$H_1$  : The mean level of responsibility of late fathers for unpaid work that is masculine will increase after the birth of the first child.

13.  $H_0$  : The mean level of responsibility of on-time fathers for unpaid work that is androgynous will not change after the birth of the first child.

$H_1$  : The mean level of responsibility of on-time fathers for unpaid work that is androgynous will change after the birth of the first child.

14.  $H_0$  : The mean level of responsibility of late fathers for unpaid work that is androgynous will not change after the birth of the first child.

$H_1$  : The mean level of responsibility of late fathers for unpaid work that is androgynous will change after the birth of the first child.

Research hypotheses nine to fourteen were framed so as to reflect expectations about the division of household tasks after the birth of the baby. It was expected that roles would be resolved along traditional lines at least initially. Thus fathers would do less of the feminine tasks after the birth. To reflect this, research hypotheses nine and ten were framed as lower-tail tests.

Although there may have been some sharing of masculine tasks and in particular gardening prior to the birth of the baby it was assumed that there would be an impetus towards the full allocation of these tasks to the husband after the birth. The physical demands of such work may have promoted this. Time constraints due to the increased domestic workload of the mother and logistical problems associated with managing the baby were also recognised as possible contributing factors. In addition since the transition to parenthood can result in the polarisation of roles along traditional line, the mindsets of both partners might alter such that they also become more traditional in their role expectations. For these reasons hypotheses eleven and twelve were framed as upper-tailed tests.

In a stratified random sample of 489 married couples Hiller and Philliber (1991) found strong agreement between husbands and wives about the responsibility for tasks such as managing (not earning) money, major purchases, planning recreation and vacations. In relation to managing money 69% of couples agreed that this was a joint responsibility. In respect of the other three roles there were very strong perceptions that they should be joint responsibilities. On average 82% of wives and 83% of husbands

had this view. This was reflected in the percent agreement between couples which was 79%, 72% and 79% for each of the three roles respectively (Hiller & Philliber 1991, pp. 133-5). Thus, in the current research these kinds of tasks were classified as androgynous. It was assumed that changes in responsibility for them would revolve around the dynamics and the changing pattern of responsibilities within each couple relationship. Some men may have increased their level of responsibility for such tasks whilst others may have reduced it. For this reason research hypotheses thirteen and fourteen were left open-ended.

The second set of hypotheses was formulated to determine if there were any differences between on-time and late fathers in terms of their participation in paid and work and unpaid work and baby care, and whether they exhibited different role salience profiles. These hypotheses are shown below.

#### **Paid Work**

15.  $H_0$  : Prior to the birth of the first child the mean hours of paid work for late fathers will be equal to that of on-time fathers.

$H_1$  : Prior to the birth of the first child the mean hours of paid work for late and on-time fathers will be unequal.

It could be argued that professionals work longer hours than non-professionals. However, professionals and non-professionals may work long hours but for different reasons. The nature of professional work and career pressure may dictate that long hours be worked. On the other hand financial demands may require non-professionals to work long hours (Hunt & Hunt 1986, p. 275). Thus, research hypothesis fifteen was framed as a two-tailed test.



16.  $H_0$  : After the birth of the first child the mean hours of paid work for late fathers will be equal to that of on-time fathers.

$H_1$  : After the birth of the first child the mean hours of paid work for late fathers will be unequal to that for on-time fathers.

In keeping with the logic behind the framing of hypothesis fifteen, this research hypothesis was open-ended to permit indications of an increase or a decrease in the mean working hours.

### Unpaid Work

17.  $H_0$  : The mean hours of unpaid work that is feminine will be equal for late and on-time fathers prior to the birth of the first child.

$H_1$  : The mean hours of unpaid which is feminine will be unequal for late and on-time fathers prior to the birth of the first child.

18.  $H_0$  : The mean hours of unpaid work that is feminine will be equal for late and on-time and late fathers after the birth of the first child.

$H_1$  : The mean hours of unpaid which is feminine will be unequal for late and on-time fathers after the birth of the first child.

19.  $H_0$  : For late and on-time fathers, the mean hours of unpaid work that is masculine will be equal, prior to the birth of the first child.

$H_1$  : For late and on-time fathers, the mean hours of unpaid work that is masculine will be unequal, prior to the birth of the first child.

20.  $H_0$  : For late and on-time fathers, the mean hours of unpaid work that is masculine will be equal, after the birth of the first child.

$H_1$  : For late and on-time fathers, the mean hours of unpaid that is masculine will be unequal, after the birth of the first child.

21.  $H_0$  : For late and on-time fathers, the mean hours of unpaid androgynous work will be equal prior to the birth of the first child.

$H_1$  : For late and for on-time fathers, the mean hours of unpaid androgynous work will be unequal prior to the birth of the first child.

22.  $H_0$  : For late and for on-time fathers, the mean hours of unpaid androgynous work will be equal after the birth of the first child.

$H_1$  : For late and for on-time fathers, the mean hours of unpaid androgynous work will be unequal after the birth of the first child.

In relation to possible differences in the contributions of on-time and late fathers to unpaid work there was a temptation to frame each of the research hypotheses (17 to 22 inclusive) as upper tail. This would have reflected an expectation that late fathers were more inclined to make greater contributions in these areas. It has been argued that sex-role ideology is a predictor of the extent to which men contribute to household tasks and childcare. Men with higher levels of education are more likely to endorse an egalitarian approach to sharing household tasks and childcare. Moreover, they are more likely to be married to women of relatively high education who will also be more likely to endorse an egalitarian ideology (Perrucci, Potter & Rhoads 1978, pp. 61-2). However, Kluwer, Heesink and Van De Vliert (1996, p. 966) observed that 'even husbands in dual-earner couples who are expected to have less traditional role expectations, seem to have not quite given up the idealised model of the traditional wife'. In a sample of predominantly middle class couples indexed by occupation and employment status (Dempsey 1997, pp. 217-8) found that 'a traditional gendered segregation of responsibility for unpaid work was in place'. Household work was divided such that males had responsibility for 'male' or 'outside tasks' such as mowing the lawn whilst women had responsibility for 'female' or 'inside' tasks such as cooking and cleaning. A large majority (80%) of male respondents perceived themselves as helpers rather than as sharers of responsibility for household tasks. Wolcott (1995, pp. 96-7) reported that in relation to contributions made by men to household work, occupational status made little difference although there was a tendency for men in higher status occupations to do more around the house. Whilst men and women endorsed the notion that childcare is a joint responsibility, women still maintained the primary responsibility for this even when they

were employed full-time in paid work. For these reasons it was decided to be circumspect in framing the research hypotheses concerning unpaid work. Thus, each of the research hypotheses seventeen to twenty two inclusive were framed as two-tailed.

The results emanating from an analysis of the data concerning paid and unpaid work for on-time and late fathers are presented below.

**Table A4.7: Participants Contributions to Paid and Unpaid Work**

Variable <sup>(a)</sup>	On-Time Fathers				Late Fathers				t	p
	M	SD	t	p	M	SD	t	p		
<i><b>Paid Work</b></i>										
First Interview	39.50	5.77			47.28	9.58			-1.54	0.14 <sup>15</sup>
Second Interview	44.50	0.00	-1.73	0.18 <sup>7</sup>	47.83	6.86	-0.37	0.72 <sup>8</sup>	-2.06	0.06 <sup>16</sup>
<i><b>Unpaid Work</b></i>										
<i><b>Feminine</b></i>										
First Interview	11.25	5.92			12.10	5.05			-0.30	0.77 <sup>17</sup>
Second Interview	14.88	3.97	-3.32	0.02 <sup>9††</sup>	12.50	6.70	-0.28	0.39 <sup>10††</sup>	0.68	0.51 <sup>18</sup>
<i><b>Masculine</b></i>										
First Interview	4.38	0.75			4.19	0.86			0.39	0.70 <sup>19</sup>
Second Interview	4.13	0.85	1.73	0.09 <sup>11††</sup>	4.03	0.90	1.68	0.02 <sup>12††</sup>	0.20	0.85 <sup>20</sup>
<i><b>Androgynous</b></i>										
First Interview	10.25	3.57			10.53	3.39			-0.15	0.89 <sup>21</sup>
Second Interview	9.75	3.23	0.71	0.53 <sup>13</sup>	9.58	4.02	1.98	0.06 <sup>14</sup>	0.08	0.94 <sup>22</sup>

(a) The results for the matched pairs data should be read vertically down the table whilst results for the group comparisons should be read horizontally across the table. The number shown as a superscript next to the *p* values refers to the respective hypotheses numbered 7-22 inclusive. The *p* values reported are two-tailed with the exception of the entries annotated † † for which the *p* values are one-tailed probabilities.

## **Paid Work**

The table shows that on-time fathers increased their mean working hours after the birth of the baby but that the increase was not significant (Hypothesis 7). Similarly there was no significant variation in the working hours of late fathers after the birth of the baby (Hypothesis 8). Relative to on-time fathers late fathers worked longer hours prior to and after the birth of their baby but these differences did not reach significance (Hypotheses 15 and 16).

## **Unpaid Work**

The results show that after the birth of the baby on-time fathers increased their contribution to feminine tasks, a movement was that in an opposite direction to that

predicted (Hypothesis 9). Thus, there was no support for the contention that they decreased their contribution to feminine tasks after the birth of the baby. The contribution of late fathers to feminine tasks was almost invariant (Hypothesis 10). Contrary to expectations the mean contribution to masculine tasks decreased for both subgroups (Hypotheses 11 and 12). No support was found for Hypotheses 13 and 14, pertaining to variations in the contributions to androgynous tasks. Thus, it can be inferred that the contributions made by the participants remained essentially static over the period of the research. The contribution to male tasks was typically near the maximum of five, and the contribution to androgynous tasks was substantial at almost two thirds of the maximum. It was evident that the partners of the participants assumed or were presumed to have responsibility for repetitive household tasks such as cleaning, ironing and cooking the evening meal. The maximum achievable score for contributions to tasks classified as feminine was 37.5. It can be seen that the contributions of on-time and late fathers fell well short of this for both occasion data.

On-time and late fathers were remarkably homogeneous in respect of the contributions they made in each of the nominated categories of unpaid household work. It may be seen that none of the Hypotheses 17 through 22 inclusive were within any reasonable distance of significance.

The questionnaire data were further analysed to determine whether there was any relationship between the work status of partners and the contribution of participants to feminine tasks. The following hypotheses were tested:

23.  $H_0$  : Prior to the birth of the baby the mean contribution of participants to feminine tasks will not be moderated by their partners being engaged in full-time paid work

$H_1$  : Prior to the birth of the baby participants whose partners are engaged in full-time paid work will make a greater contribution to feminine

tasks than participants whose partners are not engaged in full-time paid work.

24.  $H_0$  : After the birth of the baby the mean contribution of participants to feminine tasks will not be moderated by their partners being engaged in full-time paid work.

$H_1$  : After the birth of the baby participants whose partners are engaged in full-time paid work will make a greater contribution to feminine tasks than participants whose partners are not engaged in full-time paid work.

The second occasion data was also partitioned such that one subgroup comprised partners, who were working either part-time or full-time whilst the other comprised partners who were not involved in any paid work. The following hypothesis was tested:

25.  $H_0$  : After the birth of the baby the mean contribution of participants to feminine tasks will not be moderated by their partners being engaged in paid work.

$H_1$  : After the birth of the baby participants whose partners are engaged in paid work will make a greater contribution to feminine tasks than participants whose partners are not engaged in paid work.

The results of the analysis are shown in Table A4.8 below.

**Table A4.8: Partners Paid Work and Contribution of Participants to Feminine Tasks**

Occasion by Work Status	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
<i>First Occasion</i>				
Partner working full-time ( <i>n</i> = 11)	11.36	5.44	0.53	0.30 <sup>23</sup>
Partner not working full-time ( <i>n</i> = 11)	12.52	4.87		
<i>Second Occasion</i>				
Partner working full-time ( <i>n</i> = 3)	17.00	6.10	1.22	0.12 <sup>24</sup>
Partner not working full-time ( <i>n</i> = 19)	12.29	7.15		
<i>Second Occasion</i>				
Partner working ( <i>n</i> = 6)	14.00	7.10	0.48	0.32 <sup>25</sup>
Partner not working ( <i>n</i> = 16)	12.53	6.16		

The data shown above demonstrate that after the birth of the baby all but three partners ceased full-time paid work. The results show that on each occasion the work status of the partner had no bearing on the contribution of participants to feminine tasks. Thus, it may be tentatively proffered that men do not share to any significant extent in unpaid household tasks that may be regarded as traditionally feminine in nature. Moreover, in the current research it made little difference whether the participant was professional or



non-professional in respect of their contributions to such tasks as cleaning, cooking and ironing. The more educated professional men who were typical of the participants did not show any marked variation from a traditional sex role ideology.

The data concerning attitudes towards women and masculine and feminine attributes of participants were analysed to determine if the contributions to feminine tasks were related to these attributes. Summary information is shown in Table A4.9 below under three of the four type classifications proposed by Spence and Helmreich (1978, p. 31). Since there was only one participant classified as 'feminine' this classification is not represented in the table. However the first case study in appendix V concerns that participant. Specific observations about his sex role identity and behaviour are presented there.

**Table A4.9: Sex Role Type and Attitudes Towards Women**

Classification <sup>(a)</sup>	Subscales				Attitudes Towards Women					
	Masculinity		Femininity		Whole Scale		Item 2 <sup>(b)</sup>		Item 8 <sup>(c)</sup>	
	M	SD	M	SD	M	SD	M	SD	M	SD
Androgynous	23.17	2.48	25.33	1.96	42.16	2.23	2.83	0.41	3.00	0.00
Masculine	23.50	2.58	19.00	3.81	36.08	4.96	2.75	0.45	2.83	0.39
Undifferentiated	18.33	1.15	18.67	3.51	32.00	2.65	2.67	0.57	2.33	0.57

(a) The subgroup sizes were  $n = 6, 12$  and  $3$  for the androgynous, masculine and undifferentiated subgroups respectively.

(b) Item 2 is: *Under modern economic conditions with women being active outside the home, men should share in household tasks such as washing dishes and doing laundry.*

(c) Item 8 is: *It is ridiculous for a woman to run a locomotive and for a man to darn socks.*

Table A4.10 below shows the contributions to feminine tasks by sex role classification.

**Table A4.10: Sex Role Type and Contributions to Feminine Tasks**

Sex Role Classification	First Occasion		Second Occasion	
	M	SD	M	SD
Androgynous	15.87	4.07	16.00	5.18
Masculine	10.40	5.12	11.31	6.34
Undifferentiated	10.00	4.26	12.33	8.84

Two, one-way analyses of variance (ANOVA) were run. The first was used to determine if there were any significant differences between the subgroups in relation to their attitudes towards women as measured by mean scores on the AWS scale. In addition

items two and eight from the scale were analysed individually. As may be seen from the footnotes to Table A4.9 item two was a direct question about whether men should share in household tasks. Whilst item eight was less direct it related to perceptions about gender role expectations.

The second analysis compared the differences between the subgroups in relation to their contributions to feminine tasks reported at each interview. The hypotheses for the first analysis are presented below.

### **Attitudes Towards Women and Sex Role Classification**

26.  $H_0$  : There will be no differences between the subgroups classified by sex role in the mean scores on the Attitudes Towards Women scale.

$H_1$  : There will be differences between the subgroups classified by sex role in the mean scores on the Attitudes Towards Women scale.

27.  $H_0$  : There will be no differences between the subgroups classified by sex role in the mean scores on item two in the Attitudes Towards Women scale.

$H_1$  : There will be differences between the subgroups classified by sex role in the mean scores on item two, in the Attitudes Towards Women scale.

28.  $H_0$  : There will be no differences between the subgroups classified by sex role in the mean scores on item eight in the Attitudes Towards Women scale.

$H_1$  : There will be differences between the subgroups classified by sex role in the mean scores on item eight in the Attitudes Towards Women scale.



The results of the first ANOVA are shown below.

**Table A4.11: ANOVA for Attitudes Towards Women by Sex Role Type**

Attitudes Towards Women	Sum of Squares	df	Mean Square	F	p
Whole Scale					
Between Groups	244.06	2	122.03		
Within Groups	309.75	18	17.21		
Total	553.81	20		7.09	0.00 <sup>26**</sup>
Item 2					
Between Groups	≈ 0	2	≈ 0		
Within Groups	≈ 0	18	0.21		
Total	3.80	20		0.14	0.87 <sup>27</sup>
Item 8					
Between Groups	0.57	2	0.45		
Within Groups	2.67	18	0.13		
Total	3.24	20		3.50	0.05 <sup>28</sup>

These results show that a significant difference was detected between the subgroups in relation to the mean scores on the AWS scale. Post hoc testing using Scheffe's method indicated that there were significant differences between those in the androgynous subgroup and those in the masculine subgroup ( $p = 0.03^*$ ), and the undifferentiated subgroup ( $p = 0.01^*$ ). Table A4.9 that those in the androgynous subgroup had a higher mean score on the AWS scale than either of the other two subgroups. In fact the mean score of 42.16 was near the maximum attainable which is 45. Thus, the androgynous participants espoused more egalitarian attitudes towards women than the other participants. The results in Table A4.11 also show that no significant differences were detected between the subgroups in the mean scores on item two but a significant difference was detected in responses on item eight from the AWS scale. Post hoc tests indicated that this difference was between the androgynous participants and those who were undifferentiated with the former recording a higher mean score on that item.

## Attitudes Towards Women and Contributions to Feminine Tasks

The hypotheses for the second analysis are presented below.

29.  $H_0$  : For the first occasion there will be no differences between the subgroups classified by sex role in the mean scores for contribution to feminine tasks.

$H_1$  : For the first occasion there will be differences between the subgroups classified by sex role in the mean scores for contribution to feminine tasks.

30.  $H_0$  : For the second occasion data there will be no differences between the subgroups classified by sex role in the mean scores for contribution to feminine tasks.

$H_1$  : For the second occasion data there will be differences between the subgroups classified by sex role in the mean scores for contribution to feminine tasks.

The results of the second ANOVA are shown below.

Table A4.12: ANOVA for Sex Role Type and Contributions to Feminine Tasks

Contributions to Female Tasks	Sum of Squares	df	Mean Square	F	p -
First Occasion					
Between Groups	132.78	2	52.90		
Within Groups	407.90	18	24.16		
Total	540.68	20		2.19	0.08 <sup>29</sup>
Second Occasion					
Between Groups	88.64	2	44.32		
Within Groups	732.81	18	40.71		
Total	821.45	20		1.09	0.36 <sup>30</sup>

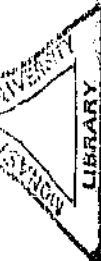
These results showed no indication of support for research hypotheses twenty-nine or thirty. Thus, the contribution to feminine tasks by participants was unaffected by their sex role classification.

In summary it was apparent that the contribution of participants to unpaid work was primarily directed at those tasks which have been classified as masculine or androgynous. These contributions were unaffected by whether the participants were on-time or late fathers or by the sex-role classification of the participants. In general the participants expressed egalitarian attitudes towards women. Whilst such views were more strongly voiced by the androgynous participants they were not manifested in

greater contributions to feminine tasks. Although there were limited data upon which to make inferences, it appeared that the contributions of participants to feminine tasks were unaffected by the work commitments of their partners.

Cultural morays mean that housework remains a 'natural' part of being a wife. Women are expected to carry out the 'inside' tasks. Husbands who participate in housework 'do so as benefactors who generously help wives with their jobs'. However, whilst wider structures and processes as well as the exercise of interpersonal power by husbands are factors which result in the persistence of the inequitable division of household work 'many wives appear ambivalent' about significant change (Dempsey 1997, p. 221). Whilst men define themselves in terms of their work women may define themselves more 'through their home-making and child-care activities than through their paid work or any other interests' (Dempsey 1997, p. 222). Thus women may seek to protect their sphere of influence by discouraging their partners from participating more fully in household work. This may help to explain why studies on the division of labour within households have found that despite the inequitable distribution of the work a large percentage of women 'seem untroubled by this'. However, another perspective is that since gender inequality is 'a pervasive feature of most modern industrial societies' women make cognitive accommodations by defining as satisfactory 'situations over which they feel they have little control' (Baxter & Western 1997, p. 18).

Baxter and Western (1997) found that it was not the size of the contribution made by men to household work which affected the satisfaction of their partners with the division of household labour but their willingness to be involved, 'to help out'. Thus 'a contribution to housework, rather than equivalence in housework responsibility, may be women's main goal' (Baxter & Western 1997, pp. 16-20). In the current research



participants were asked at each interview to indicate their level of satisfaction with the division of unpaid work. Since no real differences were evident in the profile of on-time and late fathers in terms of their contributions to unpaid work an hypothesis was framed for the group as a whole. The purpose was to determine if there was any reduction in the reported level of satisfaction with contribution to unpaid work between the first and the second interview. The conjecture was that participants might have felt that they could be doing more after the birth of the child. The hypothesis is shown below.

31.  $H_0$  : For participants the mean levels of satisfaction with contributions to unpaid work reported at the first interview and second interview will be equal.

$H_1$  : For participants the mean level of satisfaction with contributions to unpaid work reported at the second interview will be less than that reported at the first interview.

An analysis of this data produced the results shown in Table A4.13 below.

**Table A4.13: Participants Satisfaction with the Division of Unpaid Work**

Variable	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Satisfaction Levels				
First Interview	4.14	0.89		
Second Interview	4.18	0.96	0.20	0.42 <sup>31</sup>

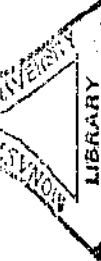
It may be seen from these results that on both occasions on-time and late fathers reported high levels of satisfaction with the division of unpaid labour. The mean scores were towards the maximum, which was 5. No significant changes in satisfaction levels for either were indicated. Ethical constraints prohibited the collection of data from partners. Thus a line of enquiry concerning the satisfaction of partners with the contributions of participants to unpaid work could not be made.

## The Transition to Fatherhood

### Self Descriptions

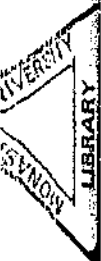
At the first interview each participant was asked to provide a response to the question *Who am I?* At the second interview participants were asked to write down eight words or phrases to describe themselves as a father, to rank them in terms of importance and to rate themselves in terms of the extent to which they felt that they gave expression to the nominated attributes. Not all participants completed this exercise since it was conceived and implemented after attempts to develop a repertory grid to elicit constructs about fathering faltered. This was not due to any difficulty with the process of elicitation since it had been mastered by that stage. Rather it was discovered that, because of the newness of the experience of the role and the almost exclusive focus of care of the baby, contrasting elements were difficult to generate. This made construct elicitation practically impossible. Similarly Ross (1994) reported that when asked to reflect on what it meant to be a father new fathers 'found it hard to articulate their sense of it' and felt that their wives seemed 'more competent and instinctive' (Ross 1994, p.51). Thus a compromise was struck, and the exercise described above was formulated, trialled and implemented. It was also decided to apply the same logic to elicit self-report descriptions of the ideal self. Thirteen participants completed three self-report exercises spanning myself as I am, my ideal self and myself as a father. In respect of the former no ranking or rating of the self-report words and phrases was requested. It was assumed that the order of mention was indicative of salience.

Because of the nature of this data some method of classification and comparison had to be devised from which sensible interpretations could be made. By this stage of the data



analysis a clearer picture of the participants had begun to emerge. It was possible to cross check analytical deductions made in relation to specific data with other indications emanating from the interviews, the repertory grid analysis and other self-report data provided by participants. For this reason an election was made to collate the data on the self, the ideal self and self as a father for subgroups based on the sex role classifications reported earlier. Following Cook (1985, p. 58) those cases in which participants recorded scores in the vicinity of the median benchmarks on the masculinity and femininity subscales of the *Personal Attributes Questionnaire* (Spence & Helmreich, 1978) were reviewed. Subsequently two of those who classified as undifferentiated were reclassified as masculine bringing the number in that subgroup to 14.

Table A4.14 shows, the top three ranked descriptors of the ideal self, self as a father and the first three nominated in response to *Who am I?* for each sex role classification. Where more than three descriptors appear in any category this signifies they were ranked equally.





**Table A4.14: Descriptions of Self by Sex Role Classification**

Classification and Occupation <sup>(a)</sup>	Who am I?	My Ideal Self <sup>(b)</sup>	Myself as a Father
<b>Masculine</b>			
1. Product Manager (28,17)	Industrious Strive for excellence Perhaps obsessive	Family oriented (8) Career success (7) Prosperous (7)	Love (8) Caring (8) Patience (6)
2. Factory Hand (21,20)	Dad Husband Happy male	Fulfilled (10) Calm (4), Patient (4) Helpful (10)	Encourager (10) Provider (5), Playmate (10) Disciplinarian (7)
3. Engineer (22,20)	Englishman Husband	Good husband (1) Good father (0) Interesting person (3)	Loving (10) Protector (10) Provider (10)
4. Systems Manager (23,22)	Honest Friendly Logical	Balanced (8) Responsible (7) Self sacrificing (7)	Responsible (7) Supportive (6) Friend (6)
5. Casino Croupier (22,21)	Honest Enjoy life Enjoy people	Family (8) Marriage (9) Understanding (9)	Loving (8) Committed (10) Caring (3)
6. Chartered Accountant (24,10)	Bright Successful Diligent	Own direction (8) Multidimensional (2) Liberated (4)	Caring (10) Bonding (5) Nurturer (4)
<b>Feminine</b>			
7. Teacher (15,27)	Migrant Teacher Friend	Kind (9), Loving (10) Trustworthy (10) Caring (9)	Nurture and support (10) Love and care (10)
<b>Androgynous</b>			
8. Shipbroker (21,23)	Responsible Caring Conscientious	Caring (9) Thoughtful, understanding (7) Conscientious (3)	Comfort (10) Protector (10) Teacher (8)
9. Furniture Manufacturer (20,27)	Hard worker Loving partner Extrovert	Honest (8) Loving (8) Hard working (6)	Teacher (9), Protector (8), Comforter (8) Companion (8), Role model (8) Provider (8), Nursemaid (6)
10. Systems Manager (23,27)	Interested Caring Motivated	Unselfish (2) Thoughtful (3) Intelligent (3)	Patient (8), Caring (9), Unselfish (7), Hard working (7), Gentle (8), Firm (5), Entertaining (8), Sensitive (7)
11. Social Worker (24,27)	Male Comfortable with myself Care for family and colleagues	Empathetic to people (9) Constructive (9) Caring (9)	Skills for life (8) Male role model (10) Caring (8)
12. Financial Accountant (27,25)	Ambitious individual Professional Sensitive and caring husband	Intelligent (8) High achiever (7) Responsible (8), Personable (10), Motivated (9) Extrovert (9), Brave (8)	Satisfy emotional needs (8) Satisfy material needs (6), Responsible (9)
13. Acoustic Engineer (24,23)	Independent Feeling Humorous	Partner (9) Life enjoyment (8) Lover (6)	Partner (10) Supporter (9) Breadwinner (9)

(a) In order that it can be presented on a single page this table is presented in 6 point Arial font.. The numbers in parentheses are the scores on the masculinity and femininity subscales of the PAQ respectively. The benchmark medians used for splits were 20 for the masculinity subscale and 23 for the femininity subscale. Piel (1985, p. 58) reported criticism of the median split method of classification for sex role orientation as 'imprecise in classifying individuals whose scores fell close to the median' and who represented 'samples of convenience' not 'defined populations'. The current research did use a convenience sample. However, in the current research all classifications were weighed against other data emanating from the research and the manner in which each participant presented at the interviews.

(b) For the ideal self and myself as a father the numbers in parentheses are the ratings out on ten awarded by participants. A score of 10 means 'I definitely see myself in this way', a score of 0 means 'I definitely do not see myself in this way'.

## The Masculine Subgroup

For the subgroup typed as masculine it may be seen that in absolute terms and relative to the other participants in that subgroup Victor (number 1 in A4.14) scored considerably higher than the median on the masculinity subscale, and considerably lower than the median on the femininity subscale. His description of himself and his

ideal self accords with a view of him as being primarily instrumental in orientation, although he nominated one expressive attribute (family oriented) as a characteristic of his ideal self and scored himself at 8 out of 10 on this. A person similar to Victor was Andrew (number 6 in A4.14). Whilst his score on the masculinity subscale was only slightly above the median at 22 (the median being 20) his score on the femininity subscale was 10 less than half the median value of 23.

In the current research these two men emerged as strongly focused on career success. Each of them scored 43 on the career salience subscale of *The Life Role Salience Scales* (Amatea, Cross, Clark, & Bobby, 1986), the maximum achievable being 50. However their experiences of the transition to fatherhood were markedly different. Victor's relationship was founded on mutual accommodation that appeared to moderate the stresses induced by long working hours. He reported working in excess of 50 hours per week on both occasions, was studying for his master's degree and was quite involved in physical activity. Whilst his contribution to unpaid work was low, the salience of his parenting role was high his score being 44 from a maximum of 50 on the parenting subscale of *The Life Role Salience Scales* (Amatea, Cross, Clark, & Bobby, 1986). This was evidenced by a significant contribution to the direct care of the baby, his score being 25 from a maximum of 40.

In contrast Andrew scored only 29 on the parenting subscale and a score on baby care of 14. At the first interview he reported working in excess of 60 hours per week and his working hours were in excess of 50 hours per week when he was interviewed again. In contrast to the Victor who rated the difficulty of the transition at 3 on a seven point Likert scale, Andrew rated the difficulty at 6. On a seven point Likert scale Victor reported stressor scores of 4, 5 and 3 for stress as a result of becoming a father, work stress and

relationship stress respectively. In contrast Andrew reported stressor scores of 4, 2 and 5 for those same items. Thus, Victor reported significant work related stress partly because he had commenced a new position and also because of his other involvement's. In contrast Andrew did not report significant work stress but his score on relationship stress was high.

Other relationship indicators support a contention that the relationship quality was markedly different for these participants. Where Victor reported global relationship satisfaction scores of 6 and 6 on a seven point Likert scale for the first and second occasion Andrew reported scores of 6 and 3. Thus the perception of Andrew was that the quality of his relationship had declined since the birth of the baby. As shown, each of these participants had similarly strong career foci. It was surmised that the peripheral involvement of Andrew with the care of the child, combined with the fact that his partner had returned to work in a demanding professional occupation, had resulted in a reduction in relationship quality. This contrasted with Victor whose partner was not working and who gave strong indications of uncompromising support for her husband.

With the exception of one instrumental descriptor used by Jim (number 4 in A4.14) who described himself as *logical*, the other descriptors in each of the categories of *Who am I?*, the ideal self, and myself as a father were either role related such as *husband*, *father*, descriptive of personal characteristics such as *Englishman*, *happy male*, value related such as *honest* and *friendly* or indicative of a communal orientation such as *enjoy people* and *enjoy life*. It may also be seen that values such as *loving*, *committed* and *caring* are the dominant descriptors of the role myself as a father.

Again it should be noted that in relation to *the ideal self* and *myself as a father* the top three nominated attributes are shown for each participant. The order in which they appear in the table represents their rank with the first ranked attributes appearing first. Thus, where history has shown that the 'good provider' role emerged as an inviolable characteristic of 'manliness' (Bernard 1986, p. 130) this was not evident in the current research. It may be seen that in Table A4.14 the term *provider* appears only three times and *breadwinner* only once. A related term used once was "satisfy material needs". None of these items were ranked first. The mean and median rankings were 3.5 and 3.5 respectively. However, it may be seen that, with the exception of the second participant, each of the respondents felt a strong obligation to acquit themselves in the role of provider. This is evidenced by the ratings awarded, none of which were below 8 out of 10. The mean and median scores were 8.25 and 9 respectively.

Returning to the other four participants in the masculine category it may be seen that each of them achieved scores on the masculinity and femininity subscales which may be described as balanced since for each of these participants the scores were in the vicinity of the medians. It may be seen that none of them used any instrumental terms when describing themselves in terms of the nominated selves. Thus although they were typed as masculine, they presented as significantly less instrumental than Victor and Andrew in relation to the actual self described under Who am I?, and the ideal self.

In this connection it was observed during the conduct of the interviews that Jim was demonstrative of more feminine than masculine attributes. It may be seen that his responses in each of categories of self were all expressive. Glen (number 5 in A4.14) provided similar responses to Jim. As has been noted instrumentality was not heavily



represented as a perception of fatherhood. In this respect the participants in this subgroup were similar to all other participants reported here.

A person who presented as the polar opposite of participants Victor and Andrew was John (number 7 in A4.14). As may be seen he is the only person represented as feminine in Table A4.14. A review of all of the responses provided by him showed that instrumentality was not indicated in any of them. Of the five supplied under *Who am I?*, the two not reported above were husband and colleague. In relation to the ideal self, the other responses in rank order (ratings out of 10 shown in parentheses) were considerate (9), sharing (9), nurturing (9) and humble (6). John's identity was almost exclusively bound up with notions of himself as expressive not instrumental. In his profession as a teacher his primary focus was on helping his students.

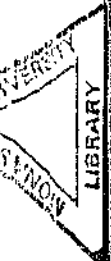
### **The Androgynous Subgroup**

In relation to those participants classified as androgynous the most different both in terms of his scores on the masculinity and femininity subscales as well as in the manner in which he presented at both interviews was Len (number 12 in A4.14). It may be seen that his scores of 28 on the masculinity subscale and 26 on the femininity subscale are the highest reported. They were also the highest when compared with those achieved by all other participants except for participant number one who achieved a slightly higher score on the masculinity scale. In terms of the androgynous type his profile was typical. It may be seen that although he was highly instrumental he also reported communal attributes in each of the three categories of self. The only other attribute reported under the ideal self and ranked fourth was *encouraging* (9). In relation to myself as a father he reported in rank order *caring* (10) ranked fourth, *devoted and intelligent* (10) ranked fifth, *cope with stress* (8) ranked sixth and *encouraging* (10)

ranked seventh. He was the only person who listed cooking as one of his recreational pursuits and indicated at both interviews that he almost invariably cooked the evening meal.

In summary the data reported in Table A4.14 were indicative of the conception of sex role orientations not as a bipolar continuum but as orthogonal categories such that it is possible for individuals to possess both feminine and masculine attributes. However, at the extremes masculinity and femininity appear to be bipolar opposites. For example in Table A4.14 those typed as highly masculine are high on masculine and low on feminine attributes (numbers 1 and 6 in A4.14); those typed as highly feminine are high on feminine and low on masculine attributes (number 7 in A4.14). Those who present as high on both masculine and feminine attributes of both attributes are typed as androgynous (number 8 to 13 in A4.14).

It was not surprising that in general participants described their ideal selves primarily in terms of value categories. However, the dominance of affective qualities in the descriptors used for myself as a father was surprising given the historical emphasis which has been given to the role of the father as breadwinner. As was shown whilst the provider role may have slipped down the hierarchy the participants were convicted about their duties in this respect. A future line of enquiry would be to evaluate descriptions of the role of father over time to determine if a halo effect was operating because of the strong affective ambience that often surrounds the birth of the first child. It may be that the provider role again resolves as the dominant perception of the father's role as children grow, more children are added and financial exigencies exert pressure. However, this may be moderated by the extent to which the provider role is shared. Traditional families in which the wives retain the major responsibility for unpaid family



work contrast with co-provider families in which male participation in family work is greater (Voyandoff 1989, pp. 12-13).

### **Fathering and Commitment to the Work Domain**

The emphasis on the expressive dimensions of fathering in the current research reflected outcomes reported by Edgar (1997). He said that 'men are concerned about relationships; they are concerned about how they can be there for their kids', 'in today's workplace' the 'one-dimensional man' whose focus is entirely on work is 'counter-productive' (Edgar 1997, p. 35). However despite arguments for 'new forms of career and family integration', there has been a failure to acknowledge in the literature 'the self-defeating adjustments that would be required of those institutions most committed to "masculine" values' to facilitate more balance between work and family roles (Hunt & Hunt 1986, p. 281). Whilst men want to be better fathers than before, many of them find it difficult to build a career and to participate meaningfully in their children's lives. In spite of the lip-service paid to family, 'companies and individual managers and supervisors are idiosyncratic in their support of family-friendly policies' (Russell 1997, p. 37). Moreover, Dench (1996) argued that:

Caring attitudes are more likely to take root among fathers who are materially responsible, so that the breadwinning role is in reality crucial (Dench 1996, p.17).

Dench (1996) also argued that 'women do want and "expect" men to be the providers' (Dench 1996, p. 250). However the type of caring intimated by him is narrow and tied to instrumental conceptions of fathering. In respect of his other proposition about women's expectations, where this is true men will encounter difficulties in attempting to rebalance their involvement's so that they can involve themselves more in the fathering role.

Such re-balancing may be to the detriment of their career.

As long as there is another tier of workers who do not value *family friendly policies*, who will apply themselves instead to occupational and professional advancement, the "gains" made by parents will only serve to differentiate their work orientations from those of serious careerists (Hunt & Hunt 1986, p. 281).

Men undergoing the transition to fatherhood would appear to be under dual pressures. On the one hand there is an expectation that they will engage strongly with the role of father whilst on the other hand there also appears to be an expectation that they will continue to be or become the main provider at least in the short term. These pressures may affect their commitment to their job, their occupation and the organisation for which they work. In the case of the former expectation there may be pressure on men to reduce these commitments whilst in the case of the latter they may feel pressured to place more emphasis on the work domain.

Because of these competing pressures it was hypothesised that at the individual level the commitment to job, career and organisation would vary from one participant to another according to their individual inclinations and circumstances as well as over time. Thus in evaluating changes in commitment levels two-tailed hypotheses were used since this reflected an expectation that commitment levels could move in either direction. In conjunction with the analysis of changes in commitment levels over time it was also decided to determine if the commitment levels reported by each subgroup at each interview were homogenous. Two tailed hypotheses were also used for this purpose. The relevant hypotheses are shown below.

32.  $H_0$  : At the first interview the mean level of job commitment reported by those in the masculine and androgynous subgroup will be equal.

$H_1$  : At the first interview the mean level of job commitment reported by those in the masculine and androgynous subgroup will be unequal.



33.  $H_0$  :At the first interview the mean level of occupational commitment reported by those in the masculine and androgynous subgroup will be equal.

$H_1$  :At the first interview the mean level of occupational commitment reported by those in the masculine and androgynous subgroup will be unequal.

34.  $H_0$  :At the first interview the mean level of organisational commitment reported by those in the masculine and androgynous subgroup will be equal.

$H_1$  :At the first interview the mean level of organisational commitment reported by those in the masculine and androgynous subgroup will be unequal.

35.  $H_0$  :At the second interview the mean level of job commitment reported by those in the masculine and androgynous subgroup will be equal.

$H_1$  :At the second interview the mean level of job commitment reported by those in the masculine and androgynous subgroup will be unequal.

36.  $H_0$  :At the second interview the mean level of occupational commitment reported by those in the masculine and androgynous subgroup will be equal.

$H_1$  :At the second interview the mean level of occupational commitment reported by those in the masculine and androgynous subgroup will be unequal.

37.  $H_0$  :At the second interview the mean level of organisational commitment reported by those in the masculine and androgynous subgroup will be equal.

$H_1$  :At the second interview the mean level of organisational commitment reported by those in the masculine and androgynous subgroup will be unequal.

38.  $H_0$  :For participants classified as masculine the mean level of commitment to their job will be unchanged after the birth of the baby.

$H_1$  :For participants classified as masculine the mean level of commitment to their job will change after the birth of the baby.

39.  $H_0$  :For participants classified as masculine the mean level of commitment to their occupation will be unchanged after the birth of the baby.

$H_1$  :For participants classified as masculine the mean level of commitment to their occupation will change after the birth of the baby.



40.  $H_0$  : For participants classified as masculine the mean level of commitment to their organisation will be unchanged after the birth of the baby.

$H_1$  : For participants classified as masculine the mean level of commitment to their organisation will change after the birth of the baby.

41.  $H_0$  : For participants classified as androgynous the mean level of commitment to their job will be unchanged after the birth of the baby.

$H_1$  : For participants classified as androgynous the mean level of commitment to their job will change after the birth of the baby.

42.  $H_0$  : For participants classified as androgynous the mean level of commitment to their occupation will be unchanged after the birth of the baby.

$H_1$  : For participants classified as androgynous the mean level of commitment to their occupation will change after the birth of the baby.

43.  $H_0$  : For participants classified as androgynous the mean level of commitment to their organisation will be unchanged after the birth of the baby.

$H_1$  : For participants classified as androgynous the mean level of commitment to their organisation will change after the birth of the baby.

Table A4.15 shows the mean responses by subgroup for each occasion to questions about commitment to job, occupation and organisation where a score of five meant "totally committed" and a score of one meant "totally uncommitted". Also shown are the results of hypothesis tests thirty-two to forty-three inclusive.

Table A4.15: Work related Commitment Levels by Subgroup

Variables by Subgroup <sup>(a)</sup>	First Interview				Second Interview				t	p
	M	SD	t	p	M	SD	t	p		
<i>Job Commitment</i>										
Masculine	4.00	0.78			3.86	0.77			-0.81	0.44 <sup>38</sup>
Androgynous	4.00	0.63	0.00	1.00 <sup>32</sup>	4.17	0.41	0.92	0.37 <sup>35</sup>	0.54	0.61 <sup>39</sup>
<i>Occupational Commitment</i>										
Masculine	3.92	0.83			3.79	0.89			-0.52	0.61 <sup>40</sup>
Androgynous	4.00	0.63	0.18	0.85 <sup>33</sup>	3.83	0.75	0.11	0.91 <sup>36</sup>	-0.35	0.74 <sup>41</sup>
<i>Organisational Commitment</i>										
Masculine	3.64	0.84			3.50	0.85			-0.62	0.55 <sup>42</sup>
Androgynous	4.00	0.63	0.93	0.37 <sup>34</sup>	3.67	0.82	0.41	0.69 <sup>37</sup>	-1.58	0.18 <sup>43</sup>

(a) Only the masculine and androgynous subgroups were investigated since the other two subgroups feminine and undifferentiated each contained only one member. In the case of the latter this was because a subsequent evaluation of the members of that subgroup resulted in two members being reclassified as masculine. The size of the samples is  $n = 14$  for the masculine subgroup and  $n = 6$  for the androgynous subgroup. The results of the intergroup comparisons, which relate to hypotheses 32 to 37 inclusive, should be read vertically down the table. For the intragroup comparisons, which relate to hypotheses 38 to 43 inclusive the results should be read across the table. The results are annotated with the relevant hypothesis number.

The results in Table A4.15 indicated two things. Firstly on both occasions the subgroups were homogeneous in relation to job, occupational and organisational commitment. No significant differences between the subgroups were shown in the mean ratings on these variables (Hypotheses 32 to 37 inclusive). Secondly there was no indication that between the first and second interview the participants in the subgroups altered their level of commitment to job, occupation or organisation. No significant differences were indicated in the mean ratings for each occasion (Hypotheses 38 to 43 inclusive). Further investigation of the data on job commitment levels indicated that in thirteen cases no changes in the ratings were observed. In the nine cases where changes were observed, five indicated a decrease in job commitment and four indicated an increase in job commitment. However in relation to the number of working hours reported, on the second occasion there was no uniformity observed such that those who reported an increased commitment to their job increased their working hours whilst those who reported a decreased commitment decreased their working hours. In relation to the former, hours of work were either unchanged or increased but in all cases the partner was not working at the time of the second interview. In four of the five cases where job commitment was decreased the partner was not working at the time of the second interview and there was no change reported in hours of work. In the fifth case the number of hours worked was down but in that case the partner was working full-time. Thus there appeared to be some relationship between job commitment, hours of work and the employment status of partners such that when they were not employed in the paid workforce participants maintained or increased their working hours irrespective of increases or decreases in job commitment.



## Babycare

The questionnaire data were analysed to determine if the elements of care, concern and support articulated by the participants as indicative of their role as a father found expression in active participation in the care of the baby. In evaluating the data a benchmark score of 25 was set such that participants who achieved this score or higher were assessed as making a significant contribution. A preliminary screening of the data showed that four participants achieved scores in the range 15 to 18. All of these were typed masculine. Hypotheses were formulated to assess whether as a group the participants could be judged as having made a significant contribution to babycare and whether in terms of sex role classifications those contributions were significant. In addition a test for the difference between means was conducted to determine whether those typed as androgynous made a greater contribution to babycare. Since there was only one participant typed as feminine no hypotheses tests were possible. However, his contributions are noted below. The relevant hypotheses are shown below.

44.  $H_0$  : As a group the participants did not make a significant contribution to babycare.

$H_1$  : As a group the participants made a significant contribution to babycare.

45.  $H_0$  : As a subgroup masculine participants did not make a significant contribution to babycare..

$H_1$  : As a group masculine participants made a significant contribution to babycare.

46.  $H_0$  : As a subgroup androgynous participants did not make a significant contribution to babycare.

$H_1$  : As a group androgynous participants made a significant contribution to babycare.

47.  $H_0$  : The mean contribution to babycare was equal for masculine and androgynous participants.

$H_1$  : The mean contribution to babycare was higher for androgynous participants than for masculine participants.

Table A4.16 shows the data and the indications emanating from the hypotheses tests.

**Table A4.16: Contributions to Babycare by Sex Role Classification**

Group/Subgroup	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Whole group	31.75	8.97	16.11	0.00 <sup>44</sup>
Masculine	28.07	8.73	1.32	0.11 <sup>45</sup>
Androgynous	36.92	4.89	5.97	0.00 <sup>46</sup>
Feminine <sup>(a)</sup>	45.00		2.31	0.00 <sup>47</sup>

(a) The numbers in the subgroups were 14, 6 and 1 for the masculine, androgynous and feminine subgroups. They do not sum to 22 since one participant classified as undifferentiated was excluded from the analysis by subgroups.

The results reported above show that support was found for hypotheses forty-four. However this result was clouded by the differential contribution of participants according to their sex role classification. It may be seen that when the masculine and androgynous subgroups were analysed individually, that the contribution to babycare of those typed as masculine was not judged significant in terms of the benchmark established for the current research. Those in the androgynous subgroup did make a significant contribution, and that contribution was significantly higher than that made by those in the masculine subgroup.

Another analysis of the data about babycare was undertaken to test the following hypothesis.

48.  $H_0$  : The mean contribution to babycare by participants whose partners were working after the birth of the baby will not be significant.

$H_1$  : The mean contribution to babycare by participants whose partners were working after the birth of the bay will be significant.

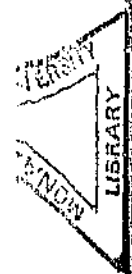
No distinction was made between partners who were working full-time and part-time. The results showed that the contributions of participants to babycare was not higher when their partners were engaged in paid work, ( $M = 30.35$ ,  $SD = 7.52$ ), ( $t = 1.71$ ,  $p = 0.07$ ). In reviewing those participants who belonged to this subgroup it was

found that two of them belonged to the androgynous subgroup whilst the other four all belonged to the masculine subgroup. In the case of the former the scores on baby care were 36 and 30 whilst in the case of the latter the scores were 33, 32, 18, 38. Thus, with one exception who was Andrew each of them made a contribution which was above the benchmark of 25. When asked about his needs as a father Andrew said 'the ability to periodically escape and to outsource the daily time requirements'. He was also one of the two participants discussed in the previous section whose primary focus was on career success. When Andrew's score was eliminated the results were ( $M = 33.10$ ,  $SD = 3.13$ ) and support was found for hypothesis forty-eight ( $t = 2.13$ ,  $p = 0.00^{**}$ ). Notwithstanding the small size of the sub-sample an inference which has commonsense appeal is that when partners returned to paid work participants were obligated to make more contributions to baby care.

In summary, the contributions made to baby care by participants were judged as significant when they were evaluated against the benchmark for the group as a whole. However, more detailed analysis appeared to indicate that the contribution by those who were typed as androgynous masked the lower contribution by those typed as masculine. It may be seen (by the magnitude of the Coefficients of Variation, CV) that relative to their means there was also substantially less variation in the contribution to baby care by those in the androgynous subgroup ( $CV = 13\%$ ) in comparison to those in the masculine subgroup ( $CV = 31\%$ ). John, the participant who was typed as feminine made a contribution to baby care which at 45 out of 50 was outstanding relative to all of the other participants. There were factors related to his personal history as well as his personality that accounted for this. It was shown in Table A4.14 that his self-concept was bound up with care and concern for others.

The observation that androgynous participants made a higher and less variable contribution to babycare contrasted with the earlier results concerning contributions to unpaid work. That analysis indicated that the contributions of those typed as androgynous were not significantly different to those types as masculine. In the current research it was observed that each of the participants in the androgynous subgroup had achieved a tertiary qualification. Thus, to determine if education may have been implicated in the different contributions the sample was partitioned such that those in each of the subgroups masculine and androgynous were of similar educational profiles. That is each member of the subgroups were tertiary qualified. The numbers in the resulting subgroups were six in the androgynous subgroup and ten in the masculine subgroup. The mean contributions to babycare were again computed. It was found that the difference observed in the first instance was mirrored in these results. The results were for the androgynous subgroup ( $M_A = 36.92$ ,  $SD_A = 4.89$ ) and for the masculine subgroup ( $M_M = 26.60$ ,  $SD_M = 9.89$ ), ( $t = 2.36$ ,  $p = 0.02^*$ ). Therefore, educational status did not appear to account for the difference in contribution to babycare.

It was portended that differences in hours of work may have been a factor such that those in the androgynous subgroup were in a position to make a greater contribution because they worked shorter hours. However, an analysis of working hours revealed no significant difference. The results were ( $M_A = 49.50$ ,  $SD_A = 5.47$ ) and ( $M_M = 48.50$ ,  $SD_M = 5.16$ ), ( $t = 2.36$ ,  $p = 0.02^*$ ) for the androgynous and masculine subgroups respectively. It was concluded that working hours did not appear to be a factor, which afforded members of the subgroups differential opportunities to be involved with babycare.



Subsequently an analysis of each individual item that was used to construct the score on babycare was undertaken. The results of this are shown in Table A4.17.

**Table A4.17: Item Analysis by Subgroup for Contributions to Babycare**

Items by Subgroup <sup>(a)</sup>		<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Bathing	Androgynous	3.75	3.11	1.55	0.12
	Masculine	1.93	2.07		
Changing Nappies	Androgynous	7.00	1.22	1.38	0.09
	Masculine	5.57	2.38		
Playing with the Baby	Androgynous	4.67	0.52	0.70	0.25
	Masculine	4.43	0.76		
Taking the Baby for a Stroll	Androgynous	2.33	1.21	-0.19	0.43
	Masculine	2.43	0.94		
Giving Partner Time to be Alone	Androgynous	6.67	1.03	0.86	0.20
	Masculine	6.00	1.75		
Tending the Baby During the Night	Androgynous	12.50	2.94	2.39	0.01*
	Masculine	7.71	5.97		

(a) The size of the subgroups was  $n = 8$  and  $n = 14$  six and fourteen for the androgynous and masculine subgroups respectively.

With the exception of the mean score on the item concerning taking the baby for a stroll those in the androgynous subgroup made higher mean contributions towards babycare on every other item. However only that item relating to tending the baby during the night was registered as a significant difference. It may be seen that the mean score for the androgynous subgroup was nearly double that of the masculine subgroup.

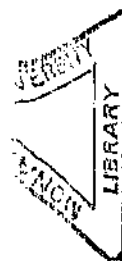
This difference was interpreted as reflective of different attitudes such that those in the masculine subgroup may have been more fixed in their viewpoint about sex roles in regard to babycare. However this interpretation must be qualified since the participants were not specifically asked about the sleeping patterns of the baby. Thus it may be that those in the masculine subgroup were fortunate in having children with better sleeping patterns. However, it might be expected that the babies would be randomly distributed among the subgroups.



Further analysis was undertaken to determine if the work status of the partner at the time of the second interview affected the behaviour of participants. Specifically it was proposed that the difference observed between those in the androgynous subgroup in respect of a greater willingness to tend to the baby during the night may have been a consequence of the fact that their partners were working in paid work. The sample was partitioned such that those in the androgynous and the masculine subgroups numbering four and ten respectively were those who indicated that their wife was not working at the time of the second interview. An analysis indicated that when this adjustment was made those in the androgynous subgroup again recorded a significantly higher mean score in relation to night tending. The results for the androgynous group were ( $M_A = 12.75, SD_A = 2.87$ ) and for the masculine subgroup ( $M_A = 7.20, SD_A = 6.20$ ), ( $t = 2.28, p = 0.02$ ). Thus, in this case participants may have been able to press the issue about night tending since their partners were not being in the paid workforce. However, those in the androgynous subgroup expressed their discretion in a greater willingness to be involved with this aspect of baby care.

### Relationship Issues

At each interview participants were asked to respond to a number of enquiries concerning their relationship. They were asked to characterise their relationship in terms of romance, friendship and partnership by allocating fifteen notional tokens such that the allocations to each category were interpreted as indicative of the salience of that attribute from their perspective. Participants were also asked to provide global ratings of relationship satisfaction. At the second interview they were asked to indicate how much stress they had felt in connection with their relationship with their partner since the birth of the baby. In addition a subscale used to measure the quality of spouse relations was



embedded within the Parenting Stress Index (Abidin, 1983). Thus, it was possible to review the character of the relationship over time and to compare different indicators of relationship quality. The following hypotheses were tested:

### Relationship Characterisation

49.  $H_0$  : For the participant group relationship characterisation in terms of the mean number of notional tokens allocated to the romance dimension will be unchanged between the first and second interview.

$H_1$  : For the participant group relationship characterisation in terms of the mean number of notional tokens allocated to the romance dimension will decrease between the first and second interview.

50.  $H_0$  : For the participant group relationship characterisation in terms of the mean number of notional tokens allocated to the friendship dimension will be unchanged between the first and second interview.

$H_1$  : For the participant group relationship characterisation in terms of the mean number of notional tokens allocated to the friendship dimension will decrease between the first and second interview.

51.  $H_0$  : For the participant group relationship characterisation in terms of the mean number of notional tokens allocated to the partnership dimension will be unchanged between the first and second interview.

$H_1$  : For the participant group relationship characterisation in terms of the mean number of notional tokens allocated to the partnership dimension will increase between the first and second interview.

52.  $H_0$  : For the masculine subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the romance dimension will be unchanged between the first and second interview.

$H_1$  : For the masculine subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the romance dimension will decrease between the first and second interview.

53.  $H_0$  : For the masculine subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the friendship dimension will be unchanged between the first and second interview.

$H_1$  : For the masculine subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the friendship dimension will decrease between the first and second interview.



54.  $H_0$  : For the masculine subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the partnership dimension will be unchanged between the first and second interview.

$H_1$  : For the masculine subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the partnership dimension will increase between the first and second interview.

55.  $H_0$  : For the androgynous subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the romance dimension will be unchanged between the first and second interview.

$H_1$  : For the androgynous subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the romance dimension will decrease between the first and second interview.

56.  $H_0$  : For the androgynous subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the friendship dimension will be unchanged between the first and second interview.

$H_1$  : For the androgynous subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the friendship dimension will decrease between the first and second interview.

57.  $H_0$  : For the androgynous subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the partnership dimension will be unchanged between the first and second interview.

$H_1$  : For the androgynous subgroup relationship characterisation in terms of the mean number of notional tokens allocated to the partnership dimension will increase between the first and second interview.

Table A4.18 shows data on relationship characterisation reported by the participant group as well as in terms of the masculine and androgynous subgroups. The subgroups comprised fourteen and six members respectively. Also shown are the results of the hypothesis tests conducted on that data.



Table A4.18: Relationship Characterisation over Time

Group	First Interview		Second Interview		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Whole Group						
Romance	3.50	1.10	3.25	1.17	-0.84	0.20 <sup>49</sup>
Friendship	6.00	1.02	5.63	1.05	-1.50	0.07 <sup>50</sup>
Partnership	5.50	1.10	6.11	1.51	2.09	0.02 <sup>51</sup>
Masculine						
Romance	3.21	1.18	3.14	1.02	-0.20	0.42 <sup>52</sup>
Friendship	6.29	1.07	5.64	1.15	-1.88	0.04 <sup>53</sup>
Partnership	5.50	1.29	6.21	1.72	1.86	0.04 <sup>54</sup>
Androgynous						
Romance	4.00	0.63	3.25	1.54	-1.03	0.17 <sup>55</sup>
Friendship	5.50	0.84	5.50	0.84	0.00	0.50 <sup>56</sup>
Partnership	5.50	0.84	6.25	1.17	1.31	0.12 <sup>57</sup>

It may be seen by the signs of the *t* statistics that for the participant group and for the subgroups that in respect of each of the nominated dimensions the movements were in conformity with those predicted by the research hypotheses. The only exception was that for the androgynous subgroup no change was observed in the mean allocation of notional token to the friendship dimension. However despite the directional conformity of the movements, support was only found for a significant perceived increase in the partnership dimension of the relationship characterisation at the level of the participant group. Subgroup analysis indicated that this appeared to emanate from increased perceptions of partnership in the masculine subgroup. Support was also indicated for a significant decrease in the friendship dimension for the masculine subgroup.

Further analysis was undertaken to determine if perceptions of relationship dimensions were moderated by relationship duration. The supposition was that if relationship duration was significantly longer for those in the androgynous subgroup this may explain why no change was observed in the friendship dimension and a non-significant change was observed in the partnership dimension of relationship characterisation. The hypothesis tested is shown below.

58.  $H_0$  : The mean relationship duration was the same for the androgynous and the masculine subgroups.

$H_1$  : The mean relationship duration for the androgynous subgroup was longer than that for the masculine subgroup.

The results were that no significant difference was observed in the mean relationship duration ( $M_A = 5.29, SD = 3.74$ ), ( $M_M = 4.51, SD = 2.54$ ), ( $t = 0.55, p = 0.29$ ). Thus, relationship duration did not appear to affect perceptions of relationship character. However if there were a causal connection between relationship duration and relationship characterisation, this could only be established with longitudinal data from a large random sample using a technique such as regression analysis.

### **Relationship Salience**

At the first and second interview participants were asked to rank in order of importance four aspects of their lives such as career, marriage, family life and leisure. Hypotheses were framed to determine if any changes in the salience of roles occurred between the first and second interview. There was a temptation to frame the hypotheses as one tail such that those relating to career and leisure would be lower-tail reflecting an expectation that the salience of these roles may decline after the birth of the baby. However it was judged that this would be restrictive in relation to the range of outcomes which may occur based on the differences between the participants. Similarly the hypotheses relating to marriage and family roles could have been framed as upper-tail to reflect an expectation of an increase in the salience of these roles. This was also judged to be restrictive in terms of outcomes that might be observed. Thus, all of the hypotheses were framed as two tailed. The relevant hypotheses are shown below.

59.  $H_0$  : For the participant group the salience of career will not change between the first and second interview.

$H_1$  : For the participant group the salience of career will change between the first and second interview.

60.  $H_0$  : For the participant group the salience of marriage will not change between the first and second interview.

$H_1$  : For the participant group the salience of marriage will change between the first and second interview.

61.  $H_0$  : For the participant group the salience of family life will not change between the first and second interview.

$H_1$  : For the participant group the salience of family life will change between the first and second interview.

62.  $H_0$  : For the participant group the salience of leisure will not change between the first and second interview.

$H_1$  : For the participant group the salience of leisure will change between the first and second interview.

63.  $H_0$  : For the masculine subgroup the salience of career will not change between the first and second interview.

$H_1$  : For the masculine subgroup the salience of career will change between the first and second interview.

64.  $H_0$  : For the masculine subgroup the salience of marriage will not change between the first and second interview.

$H_1$  : For the masculine subgroup the salience of marriage will change between the first and second interview.

65.  $H_0$  : For the masculine subgroup the salience of family life will not change between the first and second interview

$H_1$  : For the masculine subgroup the salience of family life will change between the first and second interview.

66.  $H_0$  : For the masculine subgroup the salience of leisure will not change between the first and second interview

$H_1$  : For the masculine subgroup the salience of leisure will change between the first and second interview.

67.  $H_0$  : For the androgynous subgroup the salience of career will not change between the first and second interview.

$H_1$  : For the androgynous subgroup the salience of career will change between the first and second interview.

68.  $H_0$  : For the androgynous subgroup the salience of marriage will not change between the first and second interview.

$H_1$  : For the androgynous subgroup the salience of marriage will change between the first and second interview.

69.  $H_0$  : For the androgynous subgroup the salience of family life will not change between the first and second interview.

$H_1$  : For the androgynous subgroup the salience of family life will change between the first and second interview.

70.  $H_0$  : For the androgynous subgroup the salience of leisure will not change between the first and second interview.

$H_1$  : For the androgynous subgroup the salience of leisure will change between the first and second interview.

Since ranks were used to indicate role salience, the *Sign test* was used such that only the sign of the observed differences not the quantitative magnitudes are used in the estimation of differences (Hamburg 1983, p. 542). The hypotheses are formally expressed as:

$$H_0 : p = 0.50$$

$$H_1 : p \neq 0.50$$

The data and the results of the hypothesis tests are shown in Table A4.19 below.

Table A4.19: Ranking of Roles over Time

Roles by Group/Subgroup	First Interview		Second Interview		<i>p</i>
	Mean Rank	Overall Rank	Mean Rank	Overall Rank	
<i>Whole Group</i>					
Career	2.50	3	2.59	3	0.75 <sup>59</sup>
Marriage	1.36	1	1.64	2	0.29 <sup>60</sup>
Family Life	2.05	2	1.41	1	0.08 <sup>61</sup>
Leisure	3.36	4	3.50	4	1.00 <sup>62</sup>
<i>Masculine</i>					
Career	3.07	3	2.85	2	1.00 <sup>63</sup>
Marriage	1.36	1	1.57	1	0.38 <sup>64</sup>
Family Life	1.93	2	1.57	1	0.51 <sup>65</sup>
Leisure	3.36	4	3.79	3	0.22 <sup>66</sup>
<i>Androgynous</i>					
Career	3.00	3	2.33	3	1.00 <sup>67</sup>
Marriage	1.50	1	1.50	2	1.00 <sup>68</sup>
Family Life	2.50	2	1.00	1	0.06 <sup>69</sup>
Leisure	3.33	4	3.00	4	0.38 <sup>70</sup>

The mean ranks assigned to each role were calculated for each occasion so that broad indications of similarities and differences might be shown. Thus the table shows data on the mean ranks assigned to the roles at the first and the second interview. At the level of the participant group and at the level of the two subgroups, career was never ranked first in terms of the mean ranks on either occasion. The results also show that at all levels marriage and family life were ranked first and second on the first occasion. On the second occasion family life was ranked first in terms of the mean ranks at the level of the participant group and also for each subgroups. However, the results of the sign test suggest that statistically the salience of roles was unchanged between the first and the second interview. This was not a major contradiction with the data presented on mean ranks since what that data shows primarily is alteration in the placement of roles within the hierarchy. Thus it would appear that when the first interview was conducted, which was usually in the final trimester of the pregnancy, participants had in general focused their attention on marriage and family life. When interviewed on the second occasion those roles were again ranked most salient but their position in the salience hierarchy had altered such that in terms of mean ranks family life emerged as most salient.



A number of other hypotheses were tested to determine if there were indications of differences in the salience of roles for the masculine and androgynous subgroups. These are shown below.

71.  $H_0$  : On the first occasion the salience of career will be equal for the masculine and the androgynous subgroups.

$H_1$  : On the first occasion the salience of career will be unequal for the masculine and the androgynous subgroups.

72.  $H_0$  : On the first occasion the salience of marriage will be equal for the masculine and the androgynous subgroups.

$H_1$  : On the first occasion the salience of marriage will be unequal for the masculine and the androgynous subgroups.

73.  $H_0$  : On the first occasion the salience of family life will be equal for the masculine and the androgynous subgroups.

$H_1$  : On the first occasion the salience of family life will be unequal for the masculine and the androgynous subgroups.

74.  $H_0$  : On the first occasion the salience of leisure will be equal for the masculine and the androgynous subgroups.

$H_1$  : On the first occasion the salience of leisure will be unequal for the masculine and the androgynous subgroups.

75.  $H_0$  : On the second occasion the salience of career will be equal for the masculine and the androgynous subgroups.

$H_1$  : On the second occasion the salience of career will be unequal for the masculine and the androgynous subgroups.

76.  $H_0$  : On the second occasion the salience of marriage will be equal for masculine and the androgynous subgroups.

$H_1$  : On the second occasion the salience of marriage will be unequal for the masculine and the androgynous subgroups.

77.  $H_0$  : On the second occasion the salience of family life will be equal for masculine and the androgynous subgroups.

$H_1$  : On the second occasion the salience of family life will be unequal for the masculine and the androgynous subgroups.

78.  $H_0$  : On the second occasion the salience of leisure will be equal for masculine and the androgynous subgroups.

$H_1$  : On the second occasion the salience of leisure will be unequal for the masculine and the androgynous subgroups.

The results emanating from that exercise are shown below. Since the ranking data was analysed across subgroups the *Mann Whitney U* test was used.

Table A4.20: Differences in Role Rankings Between Subgroups

Roles by Occasion <sup>(a)</sup>	<i>z</i>	<i>p</i>
First Occasion		
Career	-1.23	0.20 <sup>71</sup>
Marriage	-0.31	0.76 <sup>72</sup>
Family Life	-1.28	0.20 <sup>73</sup>
Leisure	-0.18	0.89 <sup>74</sup>
Second Occasion		
Career	-0.79	0.43 <sup>75</sup>
Marriage	-0.14	0.89 <sup>76</sup>
Family Life	-2.07	0.04 <sup>77</sup>
Leisure	-2.63	0.00 <sup>78</sup>

(a) The subgroups were masculine  $n = 14$  and androgynous  $n = 6$ .

The results in Table A4.20 indicate that on the first occasion there were no significant differences between the masculine and the androgynous subgroups in the ranking of roles. However on the second occasion two significant differences were observed such that those in the masculine subgroup tended to rank family life and leisure lower down in terms of the four roles.

On the second occasion data was also collected about the salience of roles using the *Life Role Salience Scales* (Amatea, Cross, Clark, & Bobby, 1986). Those roles were career, marriage, parenting and home, the latter being to assess the importance of having a nice home and taking time to ensure that it was maintained as such. Thus there was another opportunity to test hypotheses seventy-six, seventy-seven and seventy-eight. Since the salience of another role was measured with this scale another hypotheses was formulated. This is shown below.

79.  $H_0$  : On the second occasion the salience of home will be equal for masculine and the androgynous subgroups.

$H_1$  : On the second occasion the salience of home will be unequal for the masculine and the androgynous subgroups.

The role salience data is shown below.

**Table A4.21: Differences in Means for Life Role Salience Scales by Subgroup**

Roles	Masculine		Androgynous		t	p
	M	SD	M	SD		
Career	34.07	6.33	36.33	6.28	0.73	0.47 <sup>78</sup>
Marriage	40.79	4.77	42.83	1.47	1.45	0.17 <sup>77</sup>
Parenting	43.00	4.96	47.00	1.55	1.91	0.07 <sup>78</sup>
Home	37.21	6.18	38.33	2.29	0.38	0.71 <sup>79</sup>

If the mean scores in the table were ranked, then in the case of both subgroups parenting, marriage, home and career would be ranked one to four. Thus these results also indicated that parenting and marriage were most salient and career was least salient for both subgroups. No significant differences in mean salience scores were detected for the subgroups. Overall the indications emanating from the research were that parenting and marriage emerged as dominant aspects of the role hierarchy irrespective of the sex role orientation of the participants.

### Relationship Quality

Changes in marital satisfaction have been traditionally used as indicators of the experience of the transition to parenthood. Whilst the earlier literature promoted the notion of parenthood as crisis (Le Masters 1957, Dyer 1963), more recent studies have found that although there is a decline in relationship satisfaction after the birth of the first child crisis is not a typical outcome. Rather, at the group level, consistent but small declines have been observed in marital satisfaction. (Belsky, Spanier & Rovine 1983; Belsky 1985; Belsky, Lang & Rovine 1985; Belsky & Rovine 1990, Crohan 1996). However as noted by Belsky (1985, p.1037) 'not all families change in exactly the same manner' such that at the level of the individual the 'changes in marriage are much more

variable than consideration of central tendencies suggest' (Belsky & Rovine 1990, p.

18). A different perspective was proffered by Cowan (1988) who wrote that:

Crisis theory presents developmental progress as a possible outcome of stress ... Although we tend to assume that even short-term increases in internal or interpersonal conflict are undesirable, perhaps these conflicts serve a function of helping to reorganise the family to cope with the needs of both children and parents (Cowan, 1988, p.30).

In the current research the following hypotheses were tested.

80.  $H_0$  : For the participant group the mean level of marital satisfaction will be unchanged after the birth of the baby.

$H_1$  : For the participant group the mean level of marital satisfaction will decline after the birth of the baby.

81.  $H_0$  : For the masculine subgroup the mean level of marital satisfaction will be unchanged after the birth of the baby.

$H_1$  : For the masculine subgroup the mean level of marital satisfaction will decline after the birth of the baby.

82.  $H_0$  : For the androgynous subgroup the mean level of marital satisfaction will be unchanged after the birth of the baby.

$H_1$  : For the androgynous subgroup the mean level of marital satisfaction will decline after the birth of the baby.

The relevant data and results are shown below.

Table A4.22: Changes in Relationship Satisfaction

Group/Subgroup	First Interview		Second Interview		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Whole Group	5.94	0.64	5.40	0.79	-3.38	0.00 <sup>81**</sup>
Masculine	5.76	0.66	5.24	0.84	-2.67	0.01 <sup>82**</sup>
Androgynous	6.28	0.28	5.62	0.48	-2.30	0.03 <sup>83**</sup>

These results indicate that a significant decline in relationship satisfaction was observed at the level of the participant group and at the level of the subgroups.

Another two hypotheses were tested to determine if the levels of relationship satisfaction reported by the subgroups were homogeneous before and after the birth of the baby. These are shown below.

83.  $H_0$  : Prior to the birth of the baby the mean level of marital satisfaction will equal for the androgynous and the masculine subgroups.

$H_1$  : Prior to the birth of the baby the mean level of marital satisfaction will be unequal for the androgynous and the masculine subgroups.

84.  $H_0$  : After the birth of the baby the mean level of marital satisfaction for the androgynous subgroup will be less than or equal to the mean level of satisfaction for the masculine subgroup.

$H_1$  : After the birth of the baby the mean level of marital satisfaction for the androgynous subgroup will be greater than the mean level of satisfaction for the masculine subgroup.

Grossman (1987, p.107) reported that following the birth of the first child men who were more affiliative than autonomous were more satisfied with their relationships. For this reason it was decided to frame research hypothesis eighty-four as upper tail in the expectation that androgynous fathers would be more expressive than those classified as masculine.

The data and results are shown below.

Table A4.23: Changes in Relationship Satisfaction by Subgroup

Occasions	Masculine		Androgynous		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
First Interview	5.76	0.66	6.28	0.28	1.85	0.08 <sup>83</sup>
Second Interview	5.24	0.84	5.62	0.48	1.03	0.16 <sup>84</sup>

These results show that although on both occasions the androgynous subgroup reported a higher level of relationship satisfaction the differences were not significant.

One of the items in the Marital Satisfaction Scale (Huston 1983) asked participants to indicate how *Free/Tied* they felt. These responses were analysed to determine whether after the birth of the baby participants felt more constrained. The hypotheses that were tested are shown below.

85.  $H_0$  :After the birth of the baby participants will feel no more constrained than they did before the birth.

$H_1$  :After the birth of the baby participants will feel more constrained than they did before the birth.

86.  $H_0$  :After the birth those in the masculine subgroup will feel no more constrained than they did before the birth.

$H_1$  :After the birth of the baby those in the masculine subgroup will feel more constrained than they did before the birth.

87.  $H_0$  :After the birth those in the androgynous subgroup will feel no more constrained than they did before the birth.

$H_1$  :After the birth of the baby those in the masculine subgroup will feel more constrained than they did before the birth.

The perceptions of the participants are reported in Table A4.23

Table A4.24: Perceptions of Freedom in Relationship

Group/Subgroup <sup>(a)</sup>	First Interview		Second Interview		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Whole Group	5.25	1.16	3.65	1.39	4.88	0.00 <sup>85</sup>
Masculine	5.00	1.24	3.64	1.55	3.28	0.00 <sup>86</sup>
Androgynous	5.83	0.75	3.67	1.03	4.54	0.00 <sup>87</sup>

(a) The sample sizes are  $n = 20$ ,  $n = 14$ , and  $n = 6$  for the whole group, masculine and androgynous subgroups respectively. Two participants one classified as feminine and the other as undifferentiated were not included in these estimates.

High ratings on this item were indicative of perceptions of freedom in the relationship. For the participant group and for the subgroups the mean scores were down on the second occasion. Thus, there was the consensual view among the participants that they were more constrained after the birth of the baby than before. It was hypothesised that those in the masculine subgroup would report feeling more constrained than those in the androgynous subgroup on each occasion and this is suggested by the column data in Table A4.23 for the masculine and androgynous subgroups. However, no significant differences were observed in the means for the first occasion ( $t = 1.52$ ,  $p = 0.07$ ) or for the second occasion ( $t = 0.03$ ,  $p = 0.48$ ). Participants were also asked at each interview to indicate how satisfied they were with the amount of time they had to pursue their own

nonwork activities. The item was scored on a 5 point scale. High scores were indicative of greater satisfaction. The following hypotheses were tested.

88.  $H_0$  :After the birth of the baby those in the masculine subgroup will feel no less satisfied with the amount of time they have to pursue their own nonwork activities.

$H_1$  :After the birth of the baby those in the masculine subgroup will feel less satisfied with the amount of time they have to pursue their own nonwork activities.

89.  $H_0$  :After the birth of the baby those in the androgynous subgroup will feel no less satisfied with the amount of time they have to pursue their own nonwork activities.

$H_1$  :After the birth of the baby those in the androgynous subgroup will feel less satisfied with the amount of time they have to pursue their own nonwork activities.

The results of that analysis are shown below.

Table A4.25: Satisfaction with Time to Pursue own Nonwork Activities

Subgroup	First Interview		Second Interview		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Masculine	3.29	0.73	2.92	1.00	1.79	0.05 <sup>98</sup>
Androgynous	2.83	0.75	3.00	0.89	0.42	0.40 <sup>99</sup>

For the androgynous and masculine subgroups the results indicated that on each occasion the participants were ambivalent and that there was no significant change in their satisfaction levels in this regard. Thus, although they would have had less discretionary time after the birth of the baby there were no indications of disaffection with this.

### Summary on Relationship Issues

With one exception the self-reports indicated no significant decline in relationship satisfaction. From the other results reported it was inferred that the participants had engaged in 'emotional rehearsal' (Berman & Pedersen 1987, p. 227) for parenthood. They were prepared for and accepting of new obligations and the restrictions it would bring to their lives. At the first interview each participant was asked whether they had

planned to have a baby. All but five answered in the affirmative. One of those five was the person whose level of relationship satisfaction deteriorated after the birth of the baby the rating dropping from 6 to 3 between the first and second interview. This participant was also one of those classified as masculine who articulated a very strong commitment to his career that was manifested in working hours which he reported as being in excess of sixty hours at the first interview and fifty hours at the second interview. Each of the others except one elaborated that although they had not specifically planned to have a baby they were not troubled by the pregnancy. All of them reported high levels of relationship satisfaction at the second interview ( $M = 6.00, SD = 0.82$ ). Thus, with the exception of this small number of participants, 'planfulness' appeared to be 'a marker of readiness to move onto a parental role' (Berman & Pedersen 1987, p. 226).

### **Stressors During the Transition to Fatherhood**

The scores of participants on the Parenting Stress Index (PSI) Abidin (1983) were the primary means of assessing parenting stress following the birth of the baby. In the current research there was no basis for specifying directional hypotheses in connection with differences between subscale scores on the PIS for those in the masculine and androgynous subgroups. For economy a generalised statement is shown below as an omnibus for hypotheses ninety to ninety-eight.

90–98.  $H_0$  : The mean scores on the subscales of the Parenting Stress Index will be equal for those in the masculine and androgynous subgroups

$H_1$  : The mean scores on the subscales of the Parenting Stress Index will be unequal for those in the masculine and androgynous subgroups



Another hypothesis was tested to see if in the aggregate there was a significant difference in the mean aggregate scores on the PSI for those in the masculine and androgynous subgroups. This is shown below.

99.  $H_0$  : The mean aggregate score on the Parenting Stress Index will be equal for those in the masculine and androgynous subgroups.

$H_1$  : The mean aggregate score on the Parenting Stress Index will be unequal for those in the masculine and androgynous subgroups.

Table A4.26 below shows the data and the results of the hypotheses tests for those in the androgynous and masculine subgroups for each of the PSI subscales and the aggregate PSI scores.

Table A4.26: Parenting Stress Scores by Subgroup

Subscale Scores by Domain	Masculine		Androgynous		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Child Characteristics						
Parent reinforcement	6.79	1.89	7.17	1.47	0.19	0.67 <sup>90</sup>
Child mood	8.43	2.65	8.67	4.23	0.15	0.88 <sup>91</sup>
Child adaptability	25.36	6.00	25.33	6.62	-0.01	0.94 <sup>92</sup>
Parent Characteristics						
Competence	22.57	4.55	22.17	4.02	-0.19	0.85 <sup>93</sup>
Attachment	10.50	2.02	11.00	2.89	0.45	0.66 <sup>94</sup>
Restrictions	16.21	3.17	16.50	2.43	0.20	0.85 <sup>95</sup>
Isolation	13.29	2.87	11.83	1.60	-1.15	0.26 <sup>96</sup>
Spouse relations	15.64	3.37	15.67	3.50	0.01	0.99 <sup>97</sup>
Parental health	12.29	2.20	13.00	4.05	0.52	0.61 <sup>98</sup>
Total	131.07	14.83	131.33	21.81	0.31	0.98 <sup>99</sup>

These results indicate that in terms of each individual subscale on PSI none of the mean scores were in the vicinity of the adjusted benchmarks shown in Table 5.2 in chapter 5. This was the case for both subgroups. None of the differences between the subgroups were significant. Mean domain scores were calculated for each subgroup and compared. In the case of the child characteristics domain neither of the means were near the adjusted benchmark score of 54. The mean and standard deviation for the masculine subgroup was ( $M_M = 40.57, SD_M = 9.18$ ) and for the androgynous subgroup ( $M_A = 41.17, SD_A = 11.72$ ).

A significance test indicated that the difference between the means was not significant ( $t = 0.07$ ,  $p = 0.94$ ). Similarly in relation to the parent characteristics domain the means were not near the adjusted benchmark score of 128. The means and standard deviations for the masculine and for the androgynous subgroups were ( $M_M = 90.50, SD_M = 9.23$ ) and ( $M_A = 90.17, SD_A = 10.55$ ) respectively. A significance test indicated that the difference between the means was not significant ( $t = 0.12$ ,  $p = 0.90$ ). In relation to aggregate scores the adjusted benchmark that was used as a pointer to significant stress during the transition to parenthood was 182. Table A4.25 shows that the means for the subgroups were almost identical at 131. Thus neither subgroup registered a mean parenting stress score that was in the vicinity of the benchmark. A further examination of the data indicated that the range of scores was 100 to 169. No individual participant registered a parenting stress score near the benchmark.

Other stressor scores reported by participants were also evaluated. Descriptive statistics and the results of the hypotheses tests conducted are reported in Table A4.27 below. Again an omnibus hypothesis statement was used.

100–104.  $H_0$ : The mean scores on the individual stressors during the transition to fatherhood will be equal for those in the masculine and the androgynous subgroups.

$H_1$ : The mean scores on the individual stressors during the transition to fatherhood will be unequal for those in the masculine and the androgynous subgroups.

The responses to each of the item categories shown in Table A4.27 were ratings on a seven point scale. High scores were indicative of significant difficulty during the transition to fatherhood (the first item in Table A4.27) or significant stress in a range of areas (items two to five in Table A4.27).

**Table A4.27: Stressor Scores by Subgroup**

Subscale Scores by Domain	Masculine		Androgynous		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Difficulty of Transition	3.07	1.69	2.00	0.63	-1.49	0.15 <sup>100</sup>
Stress From Role as a Father	3.28	1.33	3.33	1.37	0.07	0.94 <sup>101</sup>
Stress Due to Work Pressures	4.07	1.38	4.17	1.33	0.14	0.88 <sup>102</sup>
Relationship Stress	3.29	1.38	3.50	0.84	0.35	0.73 <sup>103</sup>
Stress Overall Baby's Birth	3.85	1.17	3.67	0.82	-0.36	0.72 <sup>104</sup>

These results show that in the range of stressor areas investigated, the mean responses within each subgroup were not indicative of significant difficulty with the transition to fatherhood, nor of significant stress in the role of father, from work pressures or arising from relationship difficulties. The homogeneity of these results within each item category was striking. As was the case for the parenting stress indicators reported in Table A4.26 no significant differences were observed between the subgroups in any of the item categories mentioned in Table A4.27.

This completes the statistical analysis of the questionnaire data. A summary of these findings is presented in section 1 of chapter 7.

## **APPENDIX V**

### **THE MAIN STUDY — ADDITIONAL CASES**

Two ~~artificial~~ studies, which form part of the main study, are reported in this appendix.

#### **Case A5.1: John and Loretta**

##### **Introduction**

Aged 43 and 38 respectively, John and Loretta were the oldest participants in the research. John graduated in Economics in the early 1970s and subsequently qualified as a secondary school teacher. Loretta, a social worker, was employed as a senior executive in human services for the Federal Government. She had elected to resign her position shortly before the birth of the baby and had no plans to return to work.

John was eager to participate in the study and was excited about the prospect of becoming a father. During the course of the first interview reasons for his enthusiasm began to emerge. In a lengthy discussion about his life he told of his experience as an English migrant whose mother and then his father died within a short space of time. Other than a sister, John had no relatives living in Australia. He expressed a strong need for a family of his own. Prior to meeting Loretta, John had an expectation that he

may never marry. He was vocal about the warmth he felt for Loretta's father and praised him for his help in renovating the house in which he and Loretta lived. John and his father-in-law shared an interest in gardening and since they lived quite close to one another there was frequent contact between them.

At the second interview John was unable to complete the rating task for the repertory grids. An arrangement was made for him to complete them in his own time. Subsequently the grids were collected but a note with them indicated that he had lost interest in the exercise. There were indications that John was under pressure so the issue was not pursued. Whereas the second occasion data for the repertory grids were not available, the questionnaire responses and the first occasion repertory grids contrasted strongly with Len's but were similar to Peter's. Therefore, the case study data although incomplete are reported below. The case begins with biographical background followed by the repertory grids.

**Table A5.1: Biographical Data for John and Loretta**

Variable/Attribute	John	Loretta
Age	43	38
Occupation	Secondary Teacher	Social Worker
Highest Educational Qualification	Undergraduate Degree	Undergraduate Degree
Job Status	Middle Manager	Senior Manger

John had taught in the state system since qualifying as a teacher. At the time of the research he was teaching in a secondary college in the western suburbs of Melbourne. He was committed to those with lesser opportunities, happy in his occupation and showed no desire to change his career direction. When asked to describe the similarities and differences between his work and nonwork life he wrote:

I'm trying to put across agendas in both. Hopefully they could be considered good (e.g. pointing out that oppression is bad), trying to civilise the students and people I meet (can't always do it), trying to live a lifestyle that is honourable and just.

John was similar to Peter, in that he espoused Christian values and tried to live his life according to them. However he was less fervent. In this regard John's age, personality and the type of congregation to which he belonged appeared to account for the differences between him and Peter.

### Descriptions of Self and Ideal Self

Responding to *Who am I?* John wrote :

- Migrant;
- Teacher;
- Friend;
- Husband;
- Colleague.

His descriptions of his ideal self are shown in Table A5.2

Table A5.2: John's Descriptions of his Ideal Self

Word/Phrase	Ranking	Rating
Kind	1	9
Loving	1	10
Trustworthy	2	10
Caring	3	9
Considerate	4	9
Sharing	5	9
Nurturing	6	9
Humble	7	9

The descriptors used in response to *Who am I?* represented a portrayal of self in terms of roles. They were markedly different to those used by Peter and Len but similar to those used by Tim because of their impersonality. The ideal self descriptions were notable because each was expressive, no instrumental attributes were mentioned. With the exception of the attribute *humble* John's scoring of himself indicated that he was convinced about his capacity to effect these attributes. It will be shown subsequently that expressiveness was clearly the predominant characteristic of John's personality.

From John's description of Loretta she was a very successful senior manager in the Federal Public Service. There were indications that she could progress much further if

she so desired. However she was firm in her resolve to commit herself full-time to her role as a mother. Her age, and a first pregnancy that had resulted in a miscarriage, appeared to have intensified her desire to do this.

In summary, John and Loretta were older professionals who were very excited but tentative about the impending birth of their first child. Neither of them appeared to be driven by their careers. Parenthood had become their principal focus.

## The Repertory Grids

### John's Work-Nonwork Activities Grid

The work-nonwork activities grid elicited from John is shown below.

**Table A5.3: John's Work-Nonwork Activities Grid**

Fuzzy Subsets Constructs/Elements	$\tilde{E}_1$	$\tilde{E}_2$	$\tilde{E}_3$	$\tilde{E}_4$	$\tilde{E}_5$	$\tilde{E}_6$	$\tilde{E}_7$	$\tilde{E}_8$	Implicit Poles
$\tilde{C}_1$ : Physical	1.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	Mechanical
$\tilde{C}_2$ : Very pleasurable	0.8	1.0	0.0	0.0	0.0	1.0	0.0	1.0	Has to be done
$\tilde{C}_3$ : Very important	0.5	0.9	1.0	0.5	1.0	1.0	0.5	1.0	Necessary*
$\tilde{C}_4$ : Undertaking new skills	0.3	0.8	1.0	1.0	0.5	1.0	0.5	0.5	More interesting*
$\tilde{C}_5$ : Hobbies	0.8	1.0	0.0	0.5	0.0	1.0	0.0	0.5	Integral to the job
$\tilde{C}_6$ : Very important	0.9	0.9	1.0	0.5	1.0	1.0	1.0	1.0	Less impact*
$\tilde{C}_7$ : Skills I am good at	0.1	1.0	0.9	0.0	0.5	0.5	1.0	1.0	Skills I am not good at
$\tilde{C}_8$ : Future implications	1.0	0.5	1.0	0.0	0.0	1.0	0.0	0.0	Immediate consequences
Element Types					Nominated Activities				
$e_1$ : (a work activity that I like)					Take sport				
$e_2$ : (a nonwork activity that I like)					Sightsee				
$e_3$ : (a work activity that I dislike)					Marking senior level essays				
$e_4$ : (a nonwork activity that I dislike)					Fixing the car				
$e_5$ : (a work activity that I perform frequently)					Yard duty				
$e_6$ : (a nonwork activity that I perform frequently)					Tend the roses				
$e_7$ : (a work activity that is important to me)					Getting to class on time				
$e_8$ : (a nonwork activity that is important to me)					Being with my wife				

### Commentary on the Grid

The predominant themes in John's construing of his work and nonwork activities were those of obligation and importance on the one hand, and discretion and less importance on the other.



For example, it may be seen that *marking senior level essays*, *yard duty* and *getting to class on time* were construed as obligatory as indicated by the extreme rating on the implicit pole *Has to be done* of the second construct. The importance of these activities is indicated, by the ratings of them on the *Very important* pole of constructs three and six. Also reflecting the relative importance of work activities is the eighth construct *Future implications – Immediate consequences*. In this construct *marking senior level essays* stands in contrast to *yard duty* and *getting to class on time* because of the implications for senior level students.

In relation to nonwork activities it may be seen that *sightseeing*, *tend the roses* and *being with my wife* were both pleasurable and very important to John. In contrast, *fixing the car* was neither pleasurable nor particularly important to him.

Another theme emanating from the grid was that of skill as it related to the nominated activities. It may be seen that although John liked to take sport he was not particularly endowed with sporting prowess. Similarly although he was not skilled at tending the roses, this was a nonwork activity which he enjoyed. Whilst the construct *Physical – Mechanical* was used to differentiate *fixing the car* from *taking sport* and *yard duty* it also signified the mechanical nature of essay marking.

The FUZZYGRID and the CMDS results for the grid are shown below.

Table A5.4: Analytical Results for John's Work-Nonwork Activities Grid

Construct Consensus	0.46			
Polarity Ratio	46:22			
CMDS Results by Dimensions for Constructs		1	2	3
r-square		0.61	0.84	0.96
stress		0.44	0.20	0.07
Element Consensus	0.46			
CMDS Results by Dimensions for Elements		1	2	3
r-square		0.49	0.87	0.96
stress		0.40	0.17	0.07

The Golden Section was not computed for the grid since, with the exception of the second construct, positive and negative affect could not be identified nor inferred. The polarity ratio indicated that nearly seventy per cent of the ratings were polarised and that polarised ratings were more common on the explicit poles of the constructs. For both the constructs and the elements a two dimensional solution was selected for interpretation. The construct and element maps pertaining to these are shown below.

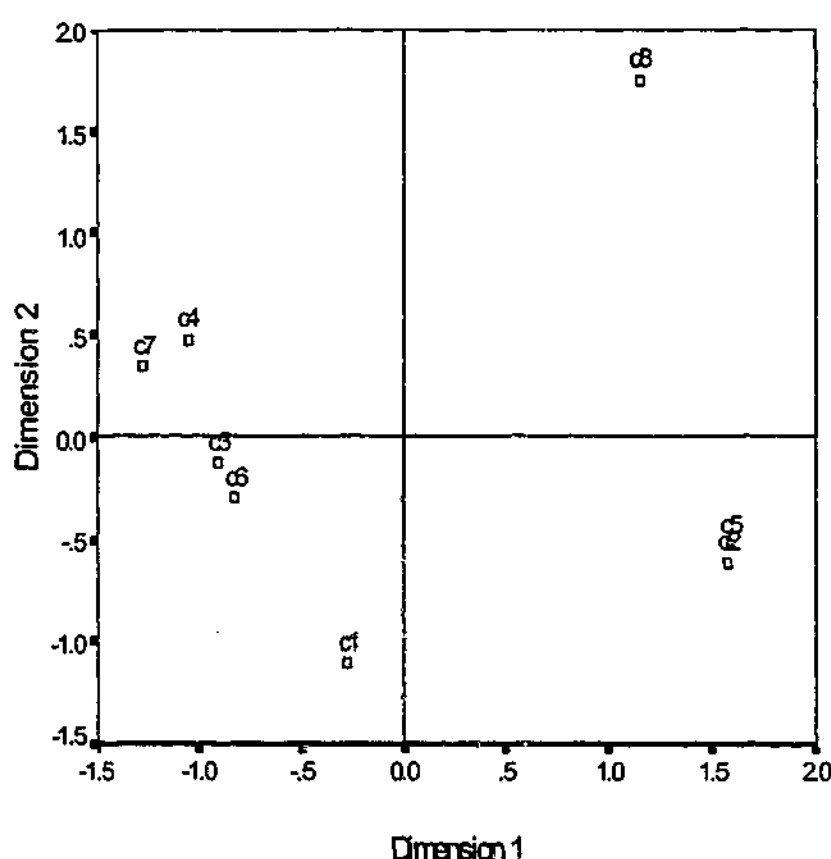


Figure A5.1: Construct Map for John's Work-Nonwork Activities Grid

### Commentary on the Construct Map

Each of the three dyads and the two isolates has distinctive characteristics. Constructs four and seven are contiguous since they represent John's construing of the skill levels required to perform the nominated activities. Constructs three and six reflect the salience of the activities whilst constructs two and five indicate John's construing of the discretion he had in relation to them. The isolates, constructs one and eight, are

distinctive from each other and from the dyads reflecting the nature of the activities as *Physical – Mechanical* and whether they had *Future – Immediate implications*.

The element map is shown below.

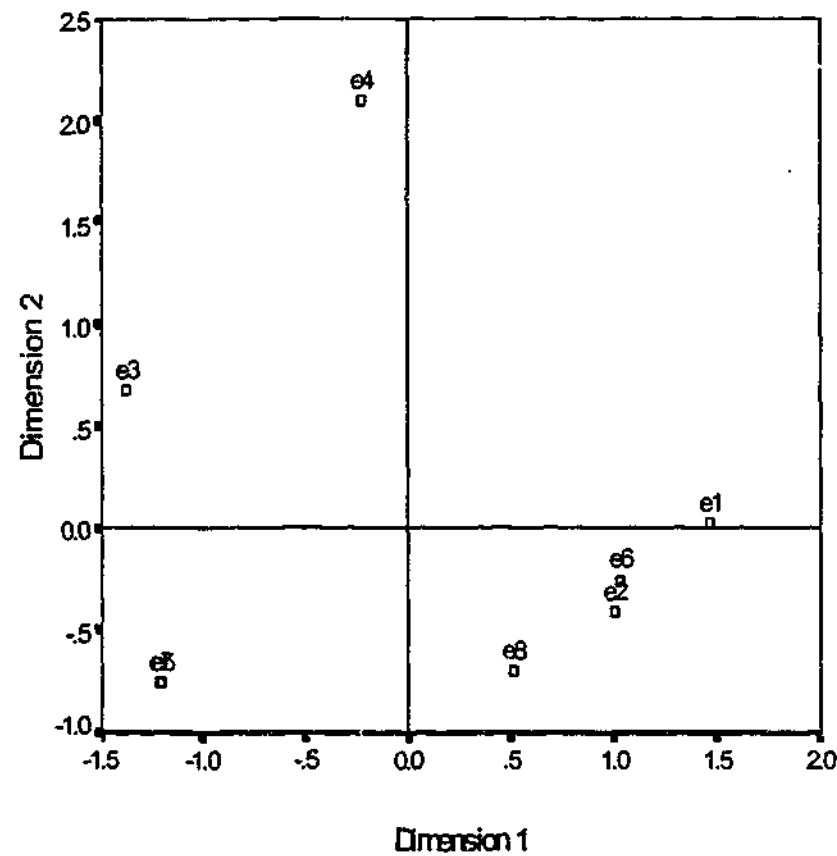


Figure A5.2: Element Map for John's Work-Nonwork Activities Grid

### Commentary on the Element Map

Whilst the activity of *take sport* (e1) was nominated by John as a work activity which he liked it was also a hobby interest of his, as may be seen from the rating of this activity on the construct *Hobbies – Integral to the job*. Thus the contiguity of this element with the nonwork activities of *sightseeing* (e2), *tend the roses* (e6) and *being with my wife* (e8) makes sense. These were activities, which John liked and also construed as very important. In contrast the work activities of *yard duty* (e5) and *getting to class on time*, (e7) were not liked by John but construed as very important.

They are the almost indistinguishable dyad located in the south-west corner of the map. The activity of *marking senior level essays* (e3) stands alone as it was construed differently from the former two. Although John construed it as a mechanical kind of activity it was integral to his job since the feedback was important for his students. Thus this activity was quite distinctive. Similarly the activity of *fixing the car* (e4) is isolated as a disliked nonwork activity at which John was not proficient but which had immediate consequences.

In summary this grid conveyed John's satisfaction with his work and nonwork life. Whilst taking sport, yard duty, rushing to class and marking essays might be a boring work life for some this was not the case for him. Moreover, outside work he actively pursued his teaching specialty, which was history. He was an avid reader of history and remarked that 'it is a very important part of my leisure time ... in fact I relish it'. Thus John's work involvement was also part of his leisure regime.

John took pleasure in spending time with his wife sightseeing and tending the roses with his father-in-law. These activities afforded him the opportunity to develop what were relatively new relationships. It was evident from speaking with John that marriage and family had become the central elements in his life.

## John's Work-People Grid

The work-people grid elicited from John is presented and discussed below.

Table A5.5: John's Work-People Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Positive	1.0	0.5	0.7	1.0	0.1	1.0	1.0	1.0	Negative
$\bar{C}_2$ : Cerebral	0.5	0.5	0.8	0.8	0.1	1.0	0.0	0.7	Mechanical
$\bar{C}_3$ : Skills I am good at	0.2	0.2	0.5	1.0	0.0	0.2	0.4	0.6	Skill I am not good at
$\bar{C}_4$ : Willing to listen to other ideas	0.3	0.1	0.3	0.5	0.0	0.0	0.8	0.2	Fixed in ideas
$\bar{C}_5$ : People I like	0.2	1.0	1.0	0.5	0.5	1.0	1.0	0.7	Something I may never do
$\bar{C}_6$ : People I feel comfortable with	0.5	1.0	1.0	0.5	0.0	1.0	1.0	0.2	Can annoy me
$\bar{C}_7$ : Feel vulnerable about jobs	0.0	1.0	0.6	0.8	0.8	0.8	0.7	0.0	Secure future
$\bar{C}_8$ : Would leave if possible	0.0	0.5	1.0	1.0	1.0	1.0	1.0	0.5	Very career orientated
Element Types				Nominated People					
$e_1$ : (a person who is important to me)				Mary					
$e_2$ : (a person who is important to me)				Len					
$e_3$ : (a person who I like)				Alex					
$e_4$ : (a person who has my ideal role)				Sue (part-time history teacher)					
$e_5$ : (a person who I dislike)				Ann					
$e_6$ : (a person who I see frequently)				Nicky					
$e_7$ : (a person who I see frequently)				Jane					
$e_8$ : (the most successful person I know)				David					

### Commentary on the Grid

John's cognitions about his work colleagues were both cognitive and affective. Constructs two and three reflect his perception of their intellectual abilities whilst constructs seven and eight were his cognitions about their job security and career ambitions. The affective constructs one, five and six reflected John's feeling about the attitude of his colleagues, whether he liked them and how comfortable he felt with them. The implicit pole of the fifth construct was a quirk of the triad of elements used to elicit the construct.

The analytical results and the accompanying maps for this grid are shown below.

**Table A5.6: Analytical Results for John's Work-People Grid**

Construct Consensus	0.47			
Golden Section Ratio <sup>(a)</sup>	59:41			
Polarity Ratio <sup>(a)</sup>	50:08			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.50	0.88	0.93
stress		0.40	0.15	0.11
Element Consensus	0.47			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.59	0.90	0.98
stress		0.43	0.18	0.07

(a) Only the first six constructs were used to calculate this ratio.

The proportion of ratings on the positive poles of the constructs was slightly lower than the benchmark of 0.62. Polar construing was quite marked on the positive poles of each of the overtly affective constructs, one, five and six. For these constructs the number of elements rated explicitly against the positive poles (unit ratings) were 5, 4 and 4 respectively. John was positively disposed to his work colleagues with the exception of Ann.

The FUZZYGRID and the CMDS results suggested a two dimensional solution should be interpreted. The construct and element maps are shown below.

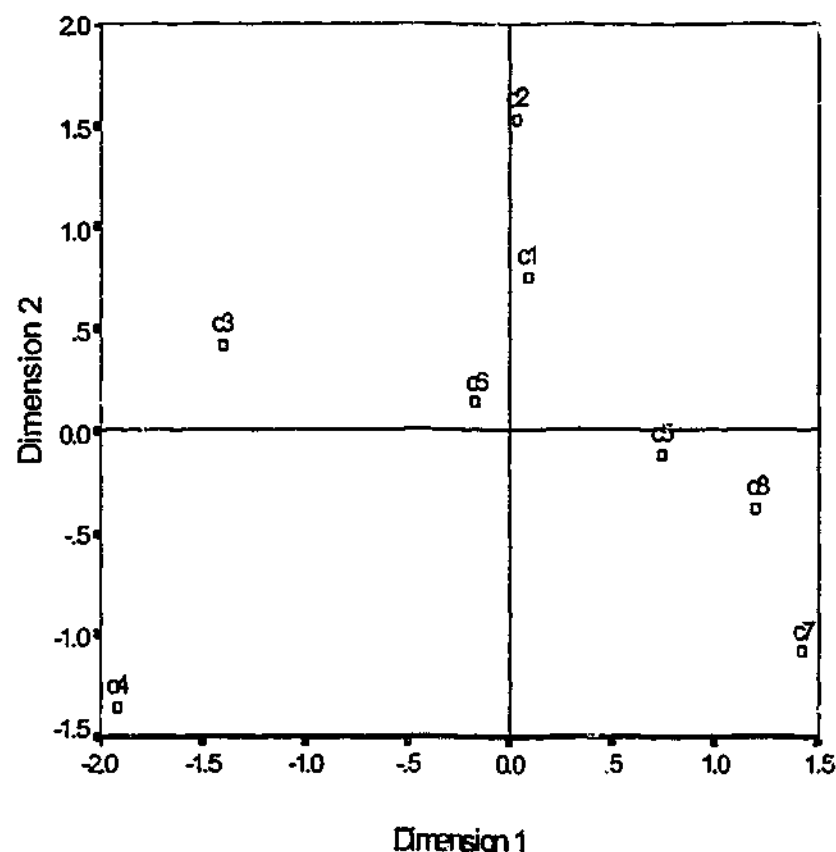


Figure A5.3: Construct Map for John's Work-People Grid

### Commentary on the Construct Map

The map shows a loose configuration of constructs. The commonality between constructs seven and eight which are located in the south-east corner was that they indicated John's perception of colleagues in terms of their job security and career orientation. The affective constructs one, five and six are a loose cluster. Whilst construct two *Cerebral – Mechanical* was primarily a cognition about the intellectual capacities of colleagues, it also had affective connotations. Since John was disposed to be cerebral, he was positively disposed to those with similar inclinations. An exception to this was Jane, one of two colleagues whom John construed as *Mechanical*, the other being Ann. However John was also drawn to people who had a positive outlook. It may be seen in the grid that on the construct *Positive – Negative* Jane was construed as

positive but Ann was construed as negative. Thus, the outlook of colleagues, not just their intellectual capacities, affected John's attitude towards them.

Constructs three and four are isolated from each other and from all others in the map. They were qualitatively different to the others and to each other. The former represented John's evaluation of the skills of colleagues relative to his own whilst the latter was his perception of whether or not they were open-minded.

The element map is shown below

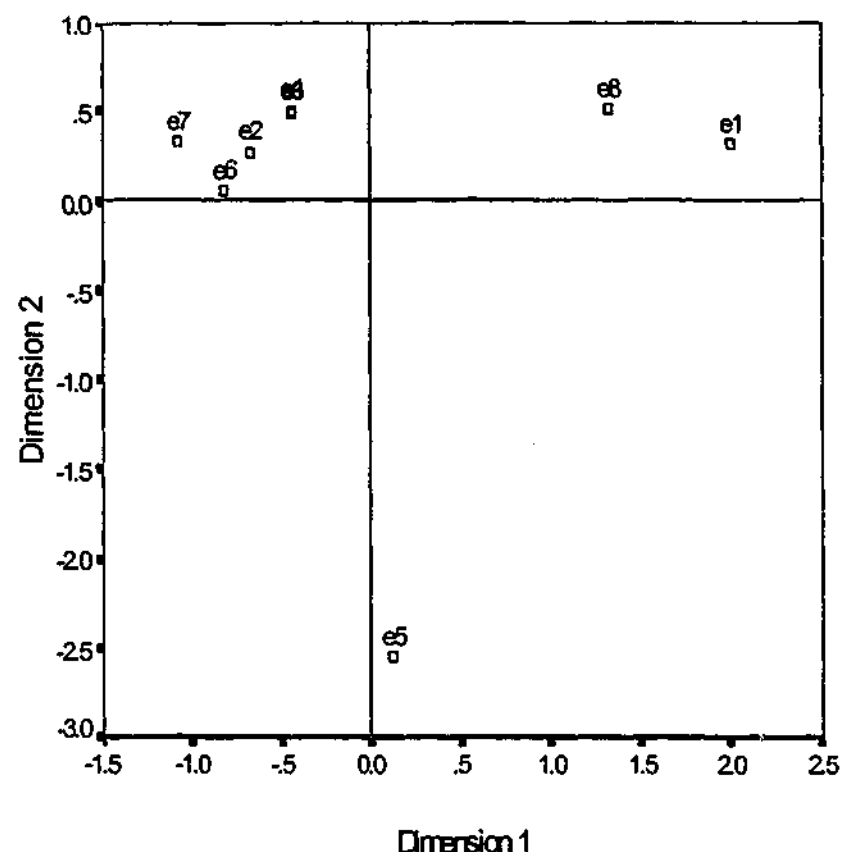


Figure A5.4: Element Map for John's Work-People Grid

#### Commentary on the Element Map

The element map shows one cluster that represents John's closest work colleagues. The dyad in the northeast corner shows Mary and David close together.



In examining the ratings in the grid, what appeared to differentiate these two colleagues from the others were their positive job prospects together with strong career salience as indicated by constructs seven and eight respectively. Both were construed as having secure futures. It may also be seen that John construed his close colleagues as fearful about job security and frustrated with their careers, as evidenced by how they were rated on constructs seven and eight respectively. On the PAQ scales John scored fifteen on the masculine scale and twenty-seven on the feminine scale. On the basis of the median split technique these scores portrayed him as 'feminine'. In concert with John's description of his ideal self and his strong orientation towards people these results affirm the pattern observed in the element map. John empathised with colleagues who were vulnerable in their jobs and understood their frustrations in relation to their careers. The isolate towards the bottom of the map represents Ann, the colleague whom John disliked.

## John's Nonwork-People Grid

The third grid elicited from John about nonwork-people is presented and discussed below.

Table A5.7: John's Nonwork-People Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Who I would like to be like	1.0	0.7	0.8	1.0	0.0	0.2	0.5	0.7	Someone I find irritating
$\bar{C}_2$ : May make good parents	1.0	1.0	0.5	0.9	0.7	0.0	0.8	0.8	A very good parent
$\bar{C}_3$ : Much wisdom	1.0	0.8	1.0	0.5	0.0	0.0	0.5	0.5	Needs to experience life more
$\bar{C}_4$ : People who are very competent	0.5	0.9	1.0	0.5	0.5	0.0	0.7	0.5	Aware of own inadequacies
$\bar{C}_5$ : Has a great future	0.5	0.6	1.0	0.5	0.0	0.2	0.7	0.5	Never live up to her potential
$\bar{C}_6$ : Something I can be	0.4	1.0	0.0	0.5	0.5	0.5	0.2	0.5	Has great future income potential
$\bar{C}_7$ : Too personally involved	0.6	1.0	0.0	0.5	1.0	0.7	0.4	0.1	Can detach herself
$\bar{C}_8$ : Home handy man	0.3	1.0	0.3	0.5	0.5	0.3	0.3	0.3	Have much in common
Element Types					Nominated People				
$e_1$ : (a person who is important to me)					Ray				
$e_2$ : (a person who is important to me)					Peter				
$e_3$ : (a person who I like)					Elen				
$e_4$ : (my ideal self)					My ideal self				
$e_5$ : (a person who I dislike)					Nancy				
$e_6$ : (a person who I see frequently)					Karen				
$e_7$ : (a person who I see frequently)					Jan				
$e_8$ : (myself as a father)					Myself as a father				

## Commentary on the Grid

The constructs in this grid substantiated the earlier argument that 'the implicit pole is best understood as a contrast'. That is constructs may be either logical, comprising apposite poles, or peculiar, in which case the poles are not apposite. None of the constructs in this grid were apposite in form. Each one of them was examined and the meaning inferred by following a guideline which was to treat the 'strange duality' in the constructs 'as if the poles were in contrasting relation to each other' (Landfield & Epting, 1987, p.118).

The elements used for the elicitation of the first construct were one, four and five. The explicit pole of the first construct *Who I would like to be like* was John's construction of Ray (his father-in-law) and his ideal self. From John's elaboration about Ray it was clear that he was a role model whom he would like to emulate. The implicit pole *Someone I find irritating* was a negative affect directed at Nancy. Thus it was inferred that the first construct was a generalised positive – negative affect.

The elements from which the explicit pole of the second construct *May make good parents* was derived were ( $e_5$ ) Nancy and ( $e_8$ ) myself as a father. It reflected John's assessment of his and Nancy's potential as parents in contrast to Karen who was construed as a *Very good parent*. The third construct *Much wisdom – Needs to experience life more* demonstrated that John construed wisdom as gained through life experience. The ratings on the first and third construct indicated that those whom John held in high regard were also construed as wise.

The themes of competence and potential were reflected in constructs four, five and six. The seventh construct reflected John's construing of emotionality in himself and others. The rating of the ideal self at the midpoint on this construct was interpreted as an expressed desire for a balance between cognitive and emotional responses. The eighth construct proved difficult to interpret. However the elements from which it was derived were of assistance. In the elicitation of the construct elements one and four (Ray and my ideal self) were construed as *Have much in common*. Since John was very positively disposed to Ray, the nexus of these two elements made sense. In contrast Peter, the third element in the triad, was construed as a *home handy man*. John mooted at the first interview that he was not overly competent in this area.

The analytical results for this grid and the accompanying maps are presented below.

**Table A5.8: Analytical Results for John's Nonwork-People Grid**

Construct Consensus	0.49			
Golden Section Ratio	63:37			
Polarity Ratio	22:16			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.77	0.89	0.93
stress		0.33	0.15	0.11
Element Consensus	0.47			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.78	0.95	0.96
stress		0.37	0.14	0.11

Due to the absence of identifiable affect in some of the constructs, only constructs one, three, five and seven were used to calculate the Golden Section and the Polarity ratios. The former showed that John's construing of nonwork-people was positive whilst the latter indicated that polar construing was not a feature of this grid.

The construct and element maps for a two dimensional CMDS solution are shown below.

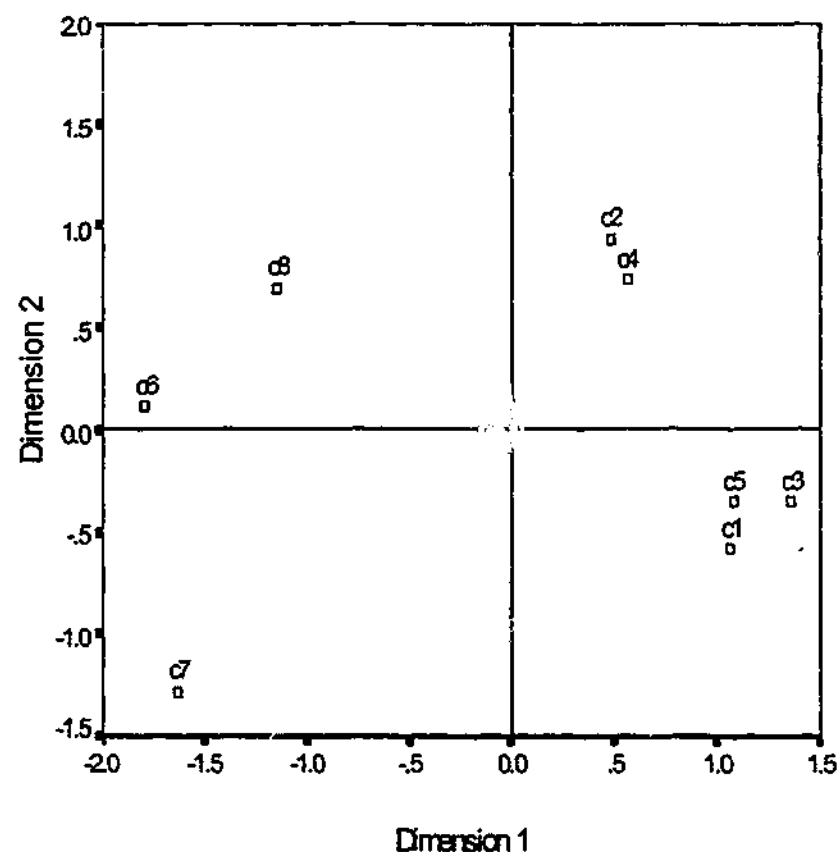


Figure A5.5: Construct Map for John's Nonwork-People Grid

### Commentary on the Construct Map

The cluster of constructs one, five and three reflected John's construing of others as *high calibre, high potential* and *wise*. Related to this was the theme of *competence* expressed in constructs two and four located adjacent to each other in the map. The proximity of constructs six and eight reflected the strong parallel that John drew between his ideal self, himself as a father and his father-in-law. It may be seen that for constructs six and eight the ratings for the ideal self and myself as a father were identical and that the ratings for Ray were almost identical to these. The isolate status of construct seven reflected its different character as an attribution about people's capacity to remain *detached*.

The element map is show below.

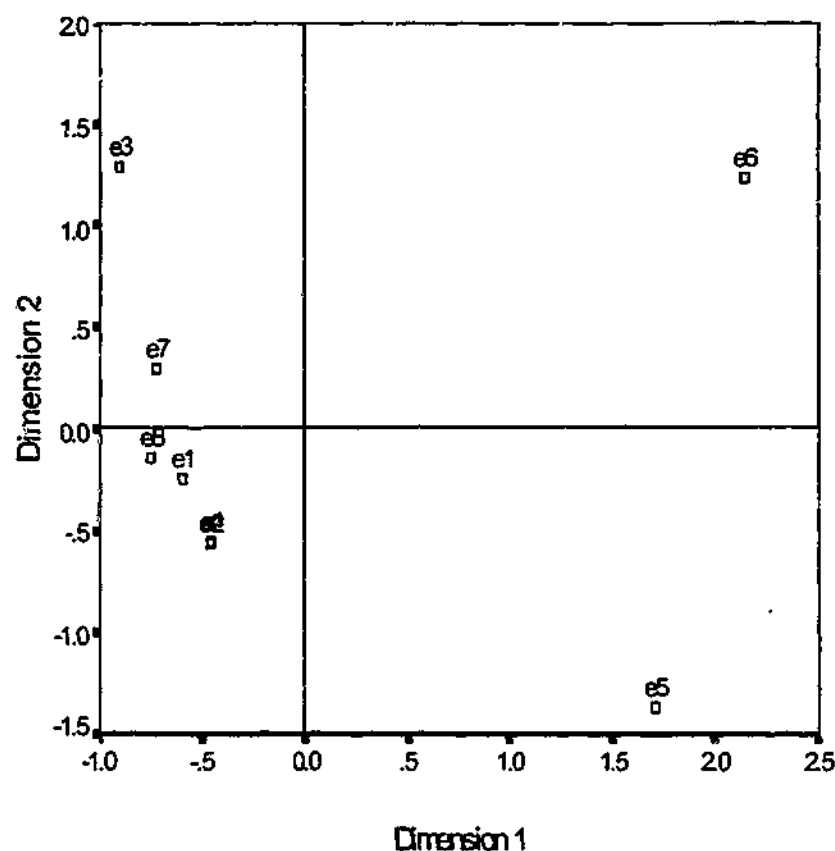


Figure A5.6: Element Map for John's Nonwork-People Grid

### Commentary on the Element Map

The element map portrays those who were close to John and others to whom he was not positively disposed. The map has two interesting features. The first is the contiguity for Ray (e1) John's father-in-law and *myself as a father* (e8). It reflected John's high regard for Ray and that he would like to emulate him. This latter assertion is evidenced by the ratings against the explicit pole of construct one, *Who I would like to be like* – for Ray and *myself as a father*. In the case of Ray the rating was 1.0 and for *myself as a father* it was 0.7. Similarly John aligned his *ideal self* (e4) very strongly with Peter (e2) as may be seen by the coincidence of the elements in the south-west region of the map.

The second interesting feature is the isolates Karen and Nancy, shown in the north-east and the south-east quadrants respectively. Whilst both of these people irritated John and were generally construed as similar, they were most differentiated on the construct *May make a good parents – A very good parent*. Whilst Nancy evidenced the potential to be a good parent, Karen had already acquitted herself well in this regard.

This completes the presentation of the repertory grids for John's case. The questionnaire data are shown below.

### The Questionnaire Data — John

#### Work and Nonwork

Data related to John's work role are shown below.

Table A5. 9: Work Related Data for John

Variable	First Interview	Second Interview
Years of work experience	More than 10	
Years with current employer	More than 10	
Years with previous employer <sup>(a)</sup>	Not applicable	
Hours of work per week	31-40	31-40
<i>Work at home</i>		
Evenings	No	No
Weekends	No	No
Go to work at on weekends	Never	Every now and then
Job satisfaction	5	5
Occupational satisfaction	5	5
Organisational satisfaction	4	2
Job commitment	4	4
Occupational commitment	4	4
Organisational commitment	4	3

(a) Data reported in the first three rows was collected at the first interview only.

#### Commentary

John was one of three participants in the research who were teachers. One of the other two reported the same number of working hours per week on both occasions, that is thirty-one to forty hours per week. The other reported working between forty-one and

fifty one hours per week on the first occasion and fifty-one to sixty hours per week on the second. However that participant was also engaged in private practice as a tutor.

John reported high satisfaction and commitment to his job and his occupation on both occasions. However his reported level of commitment to the organisation was down on the second occasion. Significant restructuring within the state education system over the period of the research may have been partly responsible for this. However, it was evident from speaking with John that the ructions within the system were not of a great concern to him. Overall the working hours required in his job and the holidays available to him were conducive to his focus on marriage and family life.

### Household Work

John's self reported contributions to domestic work is shown below

**Table A5.10: John's Contributions to Household Work**

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	0.00	3.00
Grocery shopping	3.75	3.75
Cleaning	3.00	3.00
Ironing	0.00	0.00
Cooking the evening meal	6.00	6.00
Subscore	12.75	15.75
<i>Traditional Masculine</i>		
Gardening	2.50	2.50
House maintenance	2.50	2.50
Subscore	5.00	5.00
<i>Androgynous</i>		
Budgeting	4.00	4.00
Paying bills	7.50	7.50
Negotiations with external agencies	1.50	2.00
Subscore	13.00	13.50
Total Score <sup>(a)</sup>	30.75	34.25
Satisfaction with the division of Household work	5	5

(a) The maximum achievable total score was 57.50 made up of the subscore maximums of 37.50 for traditional feminine tasks, 5.00 for traditional masculine tasks and 15.00 for androgynous tasks.

John's responses indicated that he assumed responsibility for the less repetitive tasks such as gardening and maintenance, financial matters and negotiating with external



agencies. His contribution to traditionally feminine tasks was quite low on both occasions and indicative of the average contribution reported by participants.

### **The Transition to Fatherhood**

#### **Prospective View**

When referring to the miscarriage of the first pregnancy John wrote that they 'desperately wanted to start again'. His use of language conveyed a strong sense of wanting and an urgency about becoming a father.

When asked about the anticipated changes once the baby was born John wrote:

- Whole life to change;
- less sleep;
- interrupted meals;
- less travelling (sightseeing).

Thus John was aware of wide-ranging ramifications for him once the baby was born. It was clear from his tone of voice during the first interview that he was ready and willing to make the necessary adjustments to his life.

#### **Retrospective View**

John's responses at the second interview were evidence that there had been considerable changes to his regime. Although he had prepared himself well for fatherhood, there were indications that life was more restricted and more demanding than he had envisaged. This was evident in by John's responses when asked to describe the changes that had occurred since the baby was born. He wrote:

- No cinema;
- Early nights;
- Feeling constantly fatigued;
- Feeling frustrated at all the things to remember.

Underlying the first response was the curtailment of leisure activities after the baby was born. The other three responses conveyed a strong sense of John as tired and frustrated with the demands of his new role. There were parallels between John and Tim in the affective tone of their responses at the first and second interview. Each of them was optimistic and excited when first interviewed but subdued on the second occasion. However there appeared to be different reasons for the change in their outlook. For Tim, the birth of his first child surfaced bad memories which were magnified by the cohesive family into which he had married. For John, introspection and difficulties in connection with family life did not appear to be of any concern. All of the indications were that John was very happy with the relationships and the intimacy he enjoyed with his wife and his wife's family. The birth of his child was integral to those relationships. Thus other avenues of explanation were investigated.

When John was asked to describe himself as a father he provided only two responses.

These were:

- Provide love and care;
- Provide nurture and support.

He ranked these one and two respectively and scored himself ten on each. The indications were that John's perception of his role, which found expression in his contribution to baby care had caused him to become stressed and fatigued. The evidence for this is presented in the parenting data shown below.

## Babycare

John's reported contributions to babycare are shown below.

**Table A5.11: John's Contributions to Babycare**

Task	Score <sup>(a)</sup>
Changing nappies	7.50
Bathing	7.00
Night tending	15.00
Play	5.00
Taking the baby for a stroll	4.00
Giving partner time alone	6.00
Total Score	45.00

(a) The maximum achievable score was 50

As may be seen, John's contribution was extensive. No other participant achieved such a high score. Given the way in which John presented at the first interview his score was not surprising. There may have been other factors affecting his level of contribution, but ethical considerations precluded any probing.

## Relationship Issues

### Relationship Characterisation and Role Salience

Data pertaining to relationship characterisation and role salience are shown below.

**Table A5.12: Relationship and Role Salience Data for John**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	5	5
Friendship	5	5
Partnership	5	5
<i>Ranking of Roles</i>		
Career	2	4
Marriage	1	1
Family life	1	2
Leisure	2	3
<i>Role Salience Subscales<sup>(a)</sup></i>		
Career		22
Marriage		46
Parenting		42
Home		45

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

John's characterisation of his relationship as an even split of the three dimensions was not surprising. It was consistent across occasions. His ranking of roles and the role

salience scores were consistent with expectations generated from the other data collected from him. It may be seen that his career salience score was much lower than those for his nonwork roles.

### Marital Satisfaction

Marital satisfaction data reported by John are shown below.

**Table A5.13: John's Marital Satisfaction Levels and Spouse Relations**

Item	First	Second
Miserable/Enjoyable <sup>(a)</sup>	7	6
Hopeful/Discouraging	7	7
Free/Tied Down	7	7
Empty/Full	7	7
Interesting/Boring	7	7
Rewarding/Disappointing	7	7
Doesn't Give Me Much Chance/Brings out the Best in Me*	7	7
Lonely/Friendly	7	7
Hard/Easy	7	6
Worthwhile/Useless	7	7
Overall Satisfaction	7	6
Relationship with Spouse <sup>(b)</sup>		14

(a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.

(b) The maximum achievable individual score on this subscale was 35.

The data show that John's level of marital satisfaction was very high on the first occasion and did not alter significantly after the baby was born. The low spouse relations score was indicative of good relations with his wife.

## Parenting Stress and Related Measures

Parenting stress and other perceptions of stress reported by John are shown below.

**Table A5.14: Parenting Stress Measures for John**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	5
Child mood	6
Child adaptability	30
<i>Domain Score</i>	41
<i>Parent Characteristics Domain</i>	
Competence	28
Attachment	10
Restrictions	17
Isolation	8
Relationship with spouse	14
Parental health	12
<i>Domain Score</i>	89
<b>Parenting Stress Index Score</b>	<b>130</b>

**Table A5.15: Stress Ratings Reported by John**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	2
Stress as a result of becoming a father	6
Stress from work pressures	2
Relationship stress	4
Overall stress since the birth of the baby	4

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

### Commentary

It may be seen from these data that the aggregate parenting stress score was substantially lower than the threshold of 182 that was regarded as indicative of high parenting stress. There was no reason to believe that John had under-reported the stress he had experienced on the various subscales. Nor was there any indication that the low score was an indication of a low level of involvement with the baby and the requirements of his new role. Therefore false negatives were ruled out as the reason for the low aggregate score.

An analysis of the components which made up the score, together with other responses supplied by John, substantiate the argument that John's zeal to be a good father was a cause of the tiredness and the frustration which he reported at the second interview. John did not report a strong sense of competence in relation to caring for the baby, as indicated by the high score on the competence sub-scale. The score on the adaptability subscale also suggested that the baby was difficult. John's responses to it indicated that the baby reacted strongly and was difficult to calm, did not like to be left with a baby sitter and that it was proving difficult to establish an eating and sleeping regime.

John reported little difficulty in making the transition to fatherhood, but high stress as a result of becoming a father. Thus, whilst he had embraced the role the day to day demands were a cause of significant stress. It may be seen that in relation to work pressures John reported little stress and although there was stress in the marital relationship this was not abnormally high. Nor was it unexpected that he might report some relationship stress after the birth of the baby.

### **Summary of John and Loretta's Case**

The orientation in John's life was towards marriage and family. He was as firm in this resolve as Len was about his career ambitions. Like Peter, John professed a Christian ethic that permeated his professional and personal life. At work his focus was on using and developing his skills and helping others. He did not express any ambitions to progress his career further. Support for this portrayal of John was uncovered through the analysis of the repertory grid data, John's descriptions of his ideal self and himself as a father, and his role salience scores. Other evidence for these assertions was found in the responses reported by John when asked about his current job. They were a

marked contrast to those reported by Len. The question and the responses are shown below.

*Think about your current job. Indicate how important each of the following are by circling an appropriate response.*

**Table A5.16: Saliency of Job Attributes for John and Len**

Item <sup>(a)</sup>	John	Len
1. The prestige that goes with my job	4	5
2. The prospects for advancement in my job	1	5
3. A high level of income	1	5
4. Using my abilities in my job	5	4
5. The opportunity to be creative in my job	5	4
6. The opportunity to be helpful to others through my job	5	2
7. Working with people rather than things	5	2

(a) The rating scale for the items was as follows: 5 = Very Important, 4 = Somewhat Important, 3 = Slightly Important, 2 = Not Very Important, 1 = Not at all Important.

It can be seen that in relation to each other John and Len's responses to items two and three were polarised. Whilst John expressed no desire for advancement, this was very important to Len. A high income was not important to John but very important to Len. John's focus on helping and being with people was evident in his responses to the last two items. In contrast Len did not see people as integral to his job. Bakan (1966) proposed the existence of two fundamental modalities for all living organisms, *Agency* and *Communion*.

Agency is concerned with the maintenance of the organism as an individual. It involves assertive activity, differentiation, self-protection, self-expansion, an urge towards mastery and forming separations from others. Communion is aimed toward integrated participation of the organism with the larger whole. It involves selflessness, relationships, contact, cooperation, union with others and openness (Bakan, 1966, reported in Piel 1985, p. 5).

John, it seemed, was a communal type for whom relationships and participation with others found expression in both the work and nonwork domain. Len presented as primarily agentic, as evidenced by his emphasis on his career and progression. However there were indications that he tempered this orientation in the nonwork world. This completes the presentation of this case. The next case is the final one reported in this thesis.

## Case A5.2: Glen and Rona

### Introduction

When first interviewed Glen and Rona had just moved from outer to inner Melbourne. They had purchased a single fronted terrace house in an area where the gentrification typical of many inner suburbs in Melbourne had begun to occur. When asked about the reasons for the move, Glen cited family concerns as the main motivation. He was strongly connected to his own family and was particularly close to his wife's parents. He and Rona were living with them whilst renovations were being carried out on their own home, which was nearby. The interactions between Glen and his parents-in-law were indicative of the strong bonds that existed between them.

Glen and Rona were happy to have moved back to an area with which they were familiar and where strong family support was available, particularly in view of the impending birth. Nearness to the city centre was also an advantage since the travel time to work for them was only a few minutes whereas before the move the commute was around forty minutes.

Biographical details about Glen and Rona are shown below.

**Table A5.17: Biographical Data for Glen and Rona**

Variable/Attribute	Glen	Rona
Age	28	30
Occupation	Casino Dealer	Secretary
Highest Educational Qualification	Year 12	Year 12
Job Status	Non-managerial	Non-managerial



troublesome due to injuries sustained when he was knocked down by a motor vehicle. It seemed that in different circumstances he would have pursued tertiary studies. As will become evident from the ensuing material Glen was a gregarious person who enjoyed banter but also more serious interactions. He was ideally suited to the position that he occupied at the casino. However, when the second interview was conducted Glen was no longer employed there. He was forced to resign the position due to allergic reactions. Subsequently he secured a position as an administrator with a government authority.

### Descriptions of Self and Ideal Self

At the first interview Glen described himself as follows:

- I am honest;
- A person who enjoys life;
- I enjoy working with people;
- I am happy with my present situation;
- A person who will listen to people.

Glen described his ideal self as shown in Table A5.18 below.

**Table A5.18: Glen's Descriptions of his Ideal Self**

Word/Phrase	Ranking	Rating
Family	1	8
Marriage	2	9
Understanding	3	9
Appreciated	4	7
Happy/Content	5	9
Kind	6	9
Successful	7	6
Well-liked	8	8

The dominant theme in these descriptions was of a person who was people focused not instrumental. Although Glen used the term 'successful' as indicative of his ideal self, he did not elaborate. However, an inference made after an evaluation of the other data pertaining to Glen, was that the term was not used to refer to career success. This did not appear to be high on Glen's personal agenda. Glen's scores on the masculinity and femininity subscales of the PAQ were twenty-two and twenty-one respectively. On the median split criteria he was typed as masculine. However, based on the way in which

he presented, and on the fact that these scores were in the vicinity of the median breakpoints, a judgement was made that Glen was more feminine than masculine in character.

### The Repertory Grids

The repertory grids elicited from Glen explicated his expressive personality. These are presented and discussed below.

#### Glen's Work-Nonwork Activities Grid

Table A5.19: Glen's Work-Nonwork Activities Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Hand in hand	0.1	0.0	0.5	0.2	0.5	0.5	0.8	0.4	Entertainment
$\bar{C}_2$ : Work	0.9	0.5	1.0	0.0	1.0	0.5	1.0	0.0	Not work
$\bar{C}_3$ : Communication	1.0	0.5	0.5	0.0	0.5	0.5	0.9	0.0	Relaxation
$\bar{C}_4$ : Time alone	0.0	0.0	0.2	0.8	0.5	0.2	0.9	0.5	People
$\bar{C}_5$ : Distressing	0.1	0.2	0.2	0.0	0.7	1.0	0.2	0.3	Entertainment
$\bar{C}_6$ : Protection	0.1	0.1	1.0	0.2	0.5	0.5	0.9	0.0	Hobby
$\bar{C}_7$ : Unnecessary	0.5	0.2	0.3	0.5	0.2	1.0	0.3	0.6	Financial
$\bar{C}_8$ : Big brother	0.0	0.7	1.0	0.2	0.6	0.6	0.9	0.2	Necessary
Element Types				Nominated Activities					
$e_1$ : (a work activity that I like)				Talking					
$e_2$ : (a nonwork activity that I like)				Gambling					
$e_3$ : (a work activity that is important to me )				Security					
$e_4$ : (a nonwork activity that is important to me )				Relaxation					
$e_5$ : (a work activity that I dislike)				Sorting cards					
$e_6$ : (a nonwork activity I dislike)				Boxing					
$e_7$ : (a work activity I perform frequently)				Inspect tables					
$e_8$ : (a nonwork activity I perform frequently)				Gardening					

### Commentary on the Grid

The poles of the constructs one, six and eight were *peculiar*. Thus, efforts were made to uncover the underlying dimensions.

The explicit pole of the first construct *Hand in hand* was a reference to similarity between *gambling* and *security*.

The implicit pole was a reference to *talking*, which Glen rated strongly on this pole and also on the implicit pole (*Entertainment*) of the fifth construct, the ratings being 0.9 and 0.9 respectively. Thus, the first construct was read as *Work – Entertainment*. In contrast, on the second construct *Work – Not work*, talking was rated at 0.9 demonstrating its strong relationship to Glen's work. These ratings were not inconsistent. Rather they showed the span of the activity of talking as both work and nonwork related.

Construct number six *Protection – Hobby* was also interpreted as differentiating between activities which were work related, such as security and inspecting tables, those that spanned both domains such as talking and gambling, and those related only to the nonwork domain such as *relaxation* and *gardening*. When Glen used the term *Protection* it was a reference to the vigilant character of the environment in which he worked. At the first interview he elaborated on the extensive security protocols that were in place at the casino.

*Big Brother*, which is shown as the explicit pole of the eighth construct, was a reference by Glen to the pervasiveness of the security systems at his place of work. It may be

seen that *security* and *inspect tables* attracted ratings of 1.0 and 0.9 respectively. Although Glen understood the necessity of the measures, an impression gained from him was that such measures conflicted with his easygoing nature. The term *Big Brother* was an allusion to this.

The analytical results for both occasion grids are shown below.

Table A5.20: Analytical Results for Glen's Work-Nonwork Activities Grid

<i>First Occasion Grid</i>				
Construct Consensus	0.44			
Polarity Ratio	13:16			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.31	0.91	0.95
stress		0.44	0.13	0.07
Element Consensus	0.39			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.71	0.87	0.95
stress		0.36	0.21	0.11
<i>Second Occasion Grid</i>				
Construct Consensus	0.45			
Polarity Ratio	09:14			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.91	0.84	0.60
stress		0.13	0.18	0.36
Element Consensus	0.44			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.49	0.76	0.88
stress		0.42	0.22	0.13

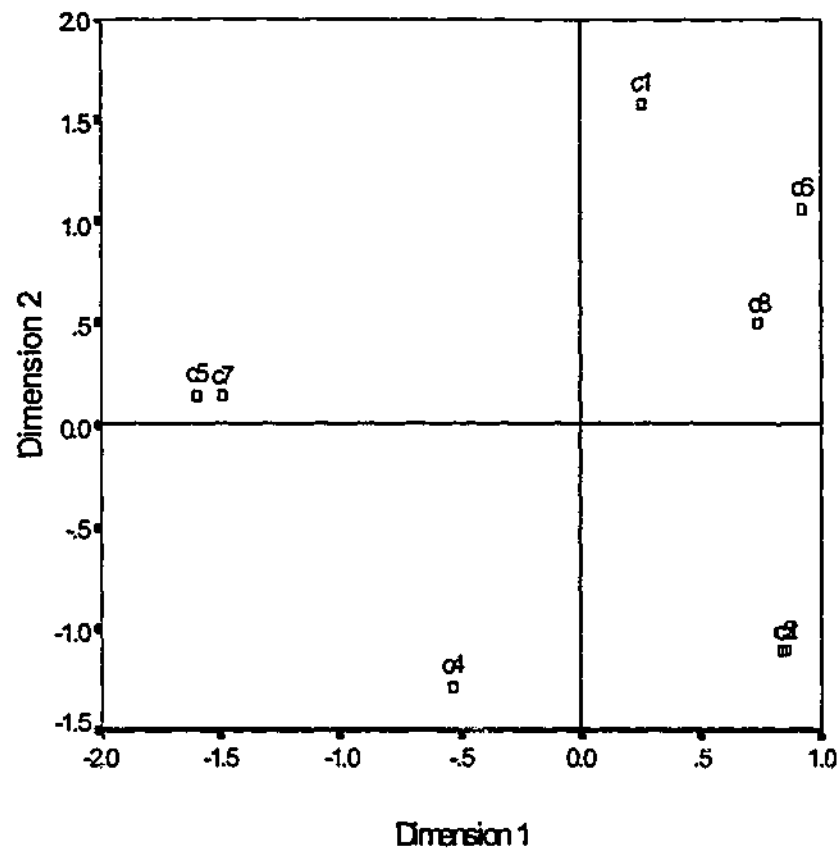
The consensus coefficients suggested a loose configuration of constructs and elements for both occasion data, and a stable structure. The Golden Section Ratio was not calculated since positive versus negative affect could not be unequivocally related to the left and right poles respectively. The polarity statistics indicated that Glen was not given to polar construing and that the proportion of ratings on the extremes was minimally variable over time. The CMDS statistics warranted that a two dimensional solution be selected for interpretation.

The results of the FPWMDS analysis are shown below.

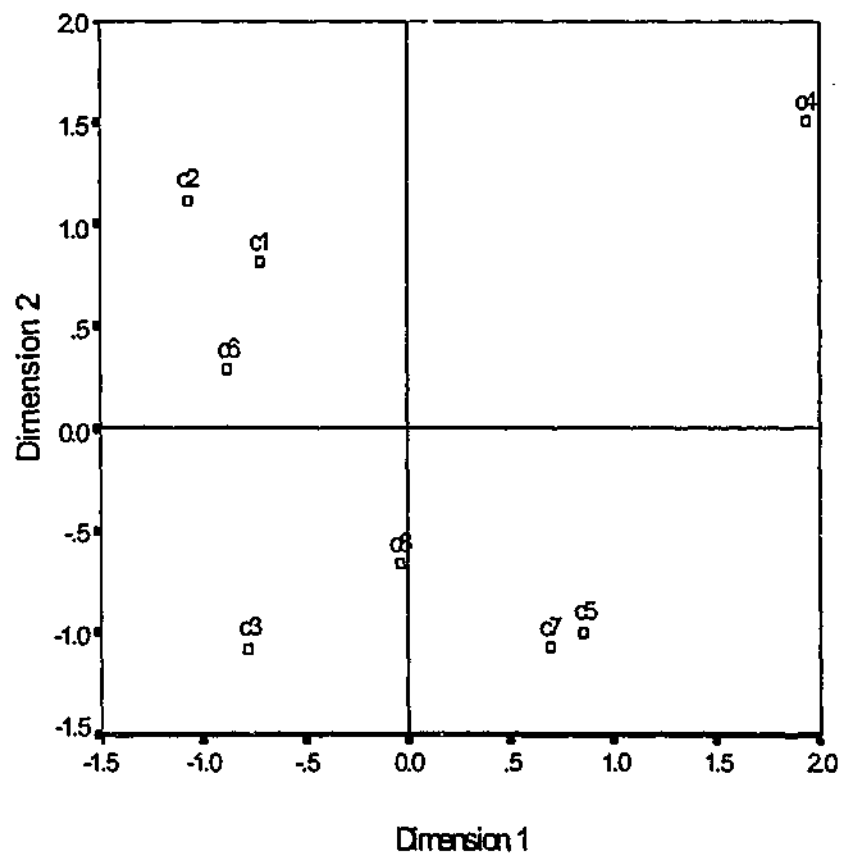
**Table A5.21: FPWMDS Model Statistics for Glen's Work-Nonwork Activities Grid**

Configurations	R-square	Stress	Weight 1	Weight 2
<i>Constructs</i>				
Reference Configuration	0.91	0.12	0.72	0.63
Second Occasion Configuration	0.32	0.38	0.28	0.21
Index of Angular Variation = 0.00				
<i>Elements</i>				
Reference Configuration	0.87	0.21	0.73	0.58
Second Occasion Configuration	0.21	0.47	0.36	0.28
Index of Angular Variation = 0.00				

These results show that the fit of the second occasion data to the reference configuration was not good for the constructs or the elements. However the values of the index of angular variation suggested no change in the underlying form. The construct and element maps are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

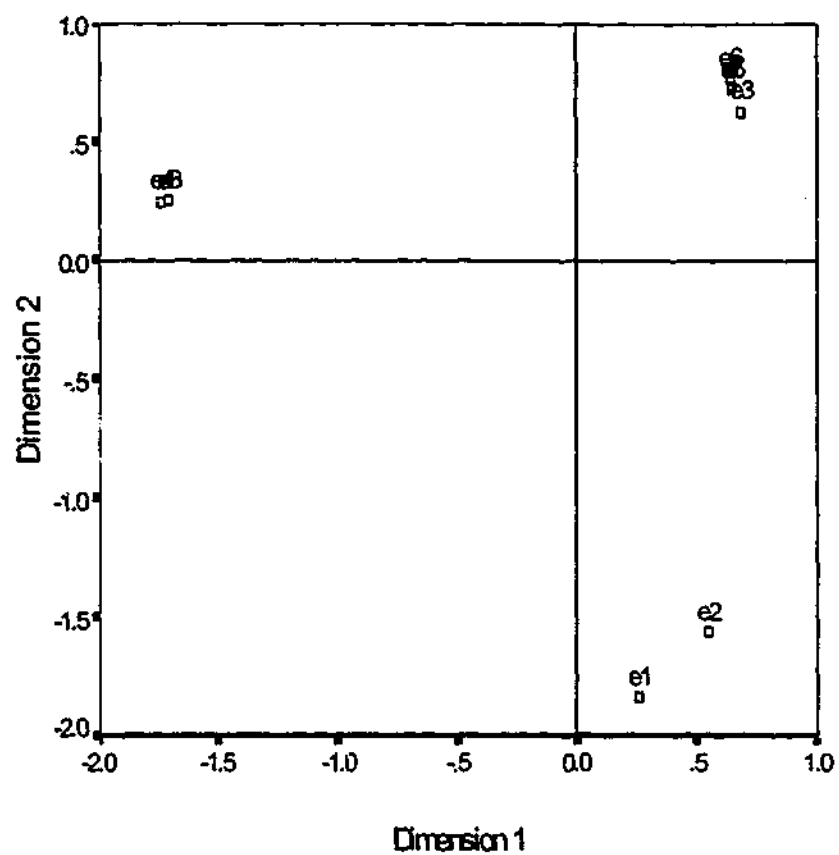
Figure A5.7: Construct Maps for Glen's Work-Nonwork Activities Grid

### Commentary on the Construct Maps

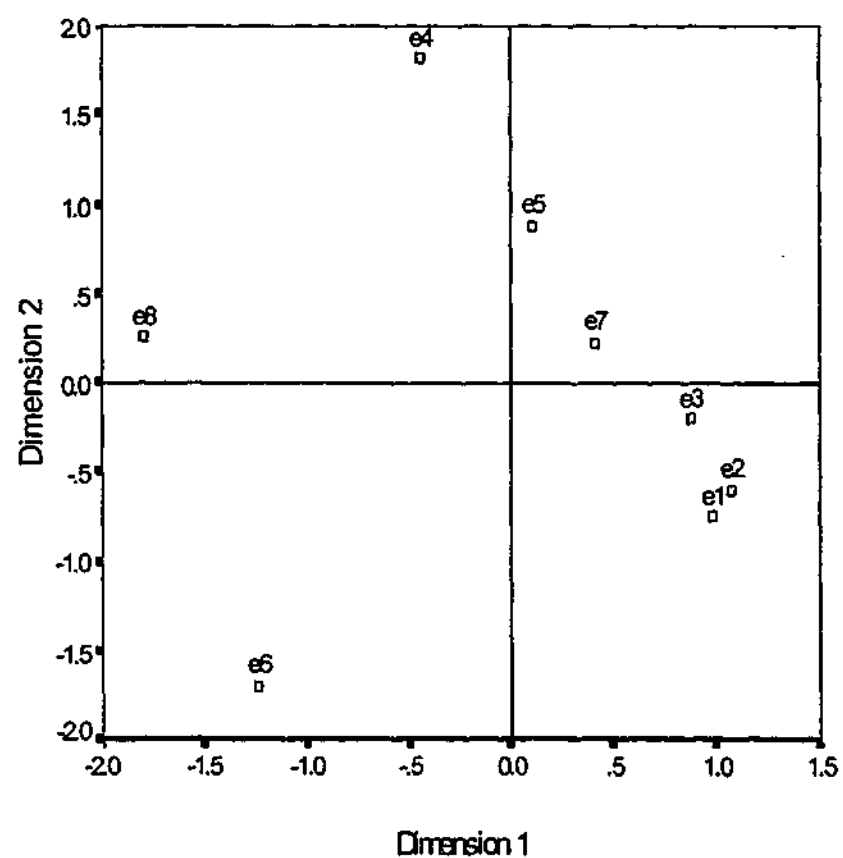
In the first map the triad in the north-east (c1, c6 and c8) and the dyad (c3 and c2) in the south-east reflected Glen's demarcation between the work and nonwork domain. Towards the western boundary the dyad (c5 and c7) reflected, in the main, Glen's distaste for boxing. The isolate (c4) was a separate dimension *Time alone – People* which contrasted the nonwork and work environments in terms of the former involving solitude and the latter involving people contact.

In the second map the configuration of constructs five and seven was unaltered and construct four was isolated as in the first map. It may be seen that the work related constructs one, two, three, six and eight were loosely arranged. Thus, the configuration in the second map was similar to the first. No change in form was indicated by the index of angular variation. However it was observed that the index was somewhat insensitive to variations in weight ratios. A judgement was made to accept this insensitivity in the same way as test-retest reliabilities are accepted as 'satisfactory' when they are in the vicinity of 0.70. Moreover, an omnibus approach to analysis was used such that more than one indicator of change was used in the current research. The consensus coefficients, the Golden Section Ratio and the Polarity ratio were each used to evaluate the grid data. Where these results were divergent other investigations were undertaken, as in the analysis of Peter's work-people grid. Apart from this, after the second meeting with participants and after collating the questionnaire data, a better feel for the basis underlying the grids was established.

The element maps are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure A5.8: Element Maps for Glen's Work-Nonwork Activities Grid



### Commentary on the Element Maps

The first map shows a clear delineation of work and nonwork activities with the exception that *boxing* was grouped together with the work activities of *security*, *sorting cards*, and *inspecting tables*. These are represented by the tight cluster in the north-east quadrant of the map. In the south-east is the dyad *talking* and *gambling*. Each of these activities spanned the work and nonwork domains. In the north-west quadrant the dyad *relaxation* and *gardening* were also identifiable as qualitatively different to the others.

The configuration in the second map shows *boxing* (e6) as an isolate. The cluster of work activities identified in the first map is looser. Similarly the dyad *relaxation* and *gardening* observed in the first map has separated somewhat. These changes made sense. On the second occasion Glen was more pointed about boxing on the constructs *Hand in Hand – Entertainment* and *Work – Not work*. Ambivalence was shown by ratings of 0.5 on both of these constructs on the first occasion, whereas on the second both of the ratings were 0.0. This explains why *boxing* appears as an isolate in the second map. Similarly whereas on the first occasion relaxation was rated as 0.0 on the *Work – Not work* construct, it was rated as 0.5 on the second, that Glen could achieve some relaxation at work. He construed *sorting cards* and *inspecting tables* as more relaxing on the second occasion since they did not involve communication. Therefore the separation of *gardening* as being nonwork related and *relaxation* as spanning both domains made sense. Despite these variations between the first and second map the essence of both maps was the same.

## Glen's Work-People Grid

The work-people grid elicited from Glen is shown below.

Table A5.22: Glen's Work-People Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Friendly	0.8	0.1	0.9	0.9	0.5	0.6	0.0	0.0	Strict
$\bar{C}_2$ : Talking	1.0	0.0	0.8	0.9	0.5	0.9	0.5	0.6	Out of sight
$\bar{C}_3$ : Tolerable	0.9	0.4	0.9	0.9	0.0	0.5	0.4	0.8	Intolerable
$\bar{C}_4$ : Friendly	0.8	0.1	0.9	0.9	0.5	0.6	0.1	0.4	Decisive
$\bar{C}_5$ : Ambitious	0.7	1.0	0.8	0.9	0.5	0.5	0.3	0.4	Over confident
$\bar{C}_6$ : Job satisfaction	1.0	0.1	0.9	0.9	0.5	0.5	0.1	0.1	Role model
$\bar{C}_7$ : Career	0.5	0.4	0.7	0.6	0.0	0.0	0.3	0.1	Money
$\bar{C}_8$ : Easygoing	0.8	0.2	0.9	0.9	0.5	0.2	0.9	0.0	Discipline*
Element Types					Nominated People				
$e_1$ : (a person who is important to me)					Myself				
$e_2$ : (a person who is important to me)					Shift manager				
$e_3$ : (a person who I like)					Lana				
$e_4$ : (a person who has my ideal role)					Jane				
$e_5$ : (a person who I dislike)					George				
$e_6$ : (a person who I see frequently)					Patrons				
$e_7$ : (a person who I see frequently)					Pit Bosses				
$e_8$ : (the most successful person I know)					Mandy				

### Commentary on the Grid

Of the three grids elicited this one was most strongly indicative of Glen's expressive nature. As an entity this grid reflected on the one hand Glen's construing of himself and two close colleagues Lana and Jane as friendly and people oriented, in contrast to others who, as superiors to Glen, were much more instrumental. Lana and Jane were presumed to be close to Glen because he construed them in almost an identical manner to himself on each of the eight constructs. Jane was a host at the casino. This was a public relations type of role to which Glen was strongly attracted. He depicted this as his ideal role, primarily because of the extensive people contact associated with it.

It may be seen that Glen nominated himself as an important person. It was inferred from his tone that he was not being smug but articulating a positive image of himself. The constructs that portray him well are constructs one, two, four, and eight. As may be seen from the ratings of himself on these it is the left poles which are indicative of Glen's personality as easygoing, friendly and talkative. The contrasting people to him in these respects were the Shift Manager, the Pit Bosses and Mandy. Pit bosses were people who had been promoted from the level of dealer. They are responsible for a *pit*. This is industry jargon for a number of gaming tables that are under the jurisdiction of one person. Mandy was a colleague whom Glen perceived as a very good operator. She had achieved a number of promotions since joining the organisation. Thus these people occupied more senior positions to Glen and were construed as being significantly different to him.

Overall the left poles of the constructs were indicative of Glen who, it was concluded was not driven by his work in the same way as his more senior colleagues were. He enjoyed the work because his role provided him with a forum in which he could express his personality. He was motivated to attain a position as a host because this would extend his capacity to engage patrons at the casino. The right poles reflected Glen's view of his superiors as instrumental and as role models for him. It seemed that he admired their application but did not see himself as possessing the attributes of decisiveness, discipline and aloofness which appeared to be characteristic of them. Glen did not lack confidence; he was by nature more expressive than instrumental.

The analytical results for both occasion grids are presented and discussed below.

**Table A5.23: Analytical Results for Glen's Work-People Grid**

<i>First Occasion Grid</i>				
Construct Consensus	0.56			
Golden Section ratio	54:46			
Polarity Ratio	06:13			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.79	0.94	0.96
stress		0.33	0.14	0.09
Element Consensus	0.45			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.47	0.85	0.94
stress		0.46	0.19	0.11
<i>Second Occasion Grid</i>				
Construct Consensus	0.48			
Golden Section Ratio	52:48			
Polarity Ratio	02:13			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.81	0.90	0.98
stress		0.26	0.16	0.04
Element Consensus	0.43			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.47	0.78	0.90
stress		0.45	0.21	0.13

### Commentary on the Results

The consensus coefficients suggested an open configuration of constructs and elements. On the second occasion the constructs were somewhat less consensual than on the first, whilst the consensus of the elements decreased marginally. On both occasions the Golden Section ratio indicated a lower proportion of elements construed on the positive poles and a higher proportion construed on the negative poles than the benchmarks established in other research. However what have been interpreted as negative poles in the grid would normally be understood as positive attributes. The most obvious examples are the right poles of construct four *Decisive*, construct six *Role model* and construct eight *Discipline*. These exemplify the idiosyncratic nature of many personal constructs (the Individuality corollary of Kelly, 1955) and the significance of the context in which constructs are articulated and used. Thus, when Glen construed some of his colleagues as *Decisive*, this was not a negative affect per se but a contrast with

his easygoing *Friendly* nature, as was *Role model* when contrasted with *Job satisfaction*. Similarly, he used the term *Discipline* not as a negative affect but as an explicit contrast to *Easygoing*. It will be seen when the next grid is presented that Glen used the construct *Dedicated – Bad habits* to differentiate between nonwork-people. In this context *Dedicated* was a simile for *Discipline*. It was used to portray his wife and his mother-in-law. The word dedication invokes images of care and concern as well as discipline. Thus, subtleties of meaning according to context were indicated by Glen's choice of words.

Whilst polarised construing was not indicated by the polarity ratios, the partitioning of colleagues into two subgroups was suggested by the differences in the ratings, particularly between elements two, seven and eight and the others.

The FPWMDS results are shown below.

Table A5.24: FPWMDS Model Statistics for Glen's Work-People Grid

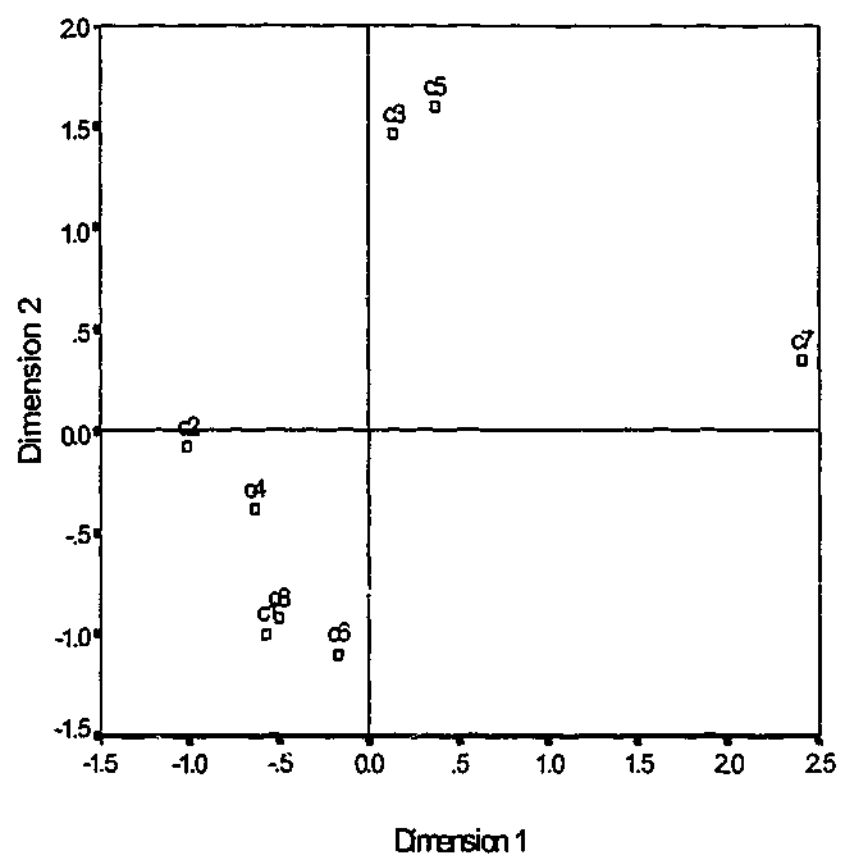
Configurations	R-square	Stress	Weight 1	Weight 2
<i>Constructs</i>				
Reference Configuration	0.94	0.13	0.71	0.65
Second Occasion Configuration	0.12	0.48	0.27	0.23
Index of Angular Variation = 0.00				
<i>Elements</i>				
Reference Configuration	0.85	0.19	0.74	0.55
Second Occasion Configuration	0.40	0.36	0.46	0.43
Index of Angular Variation = 0.01				

### Commentary on Results

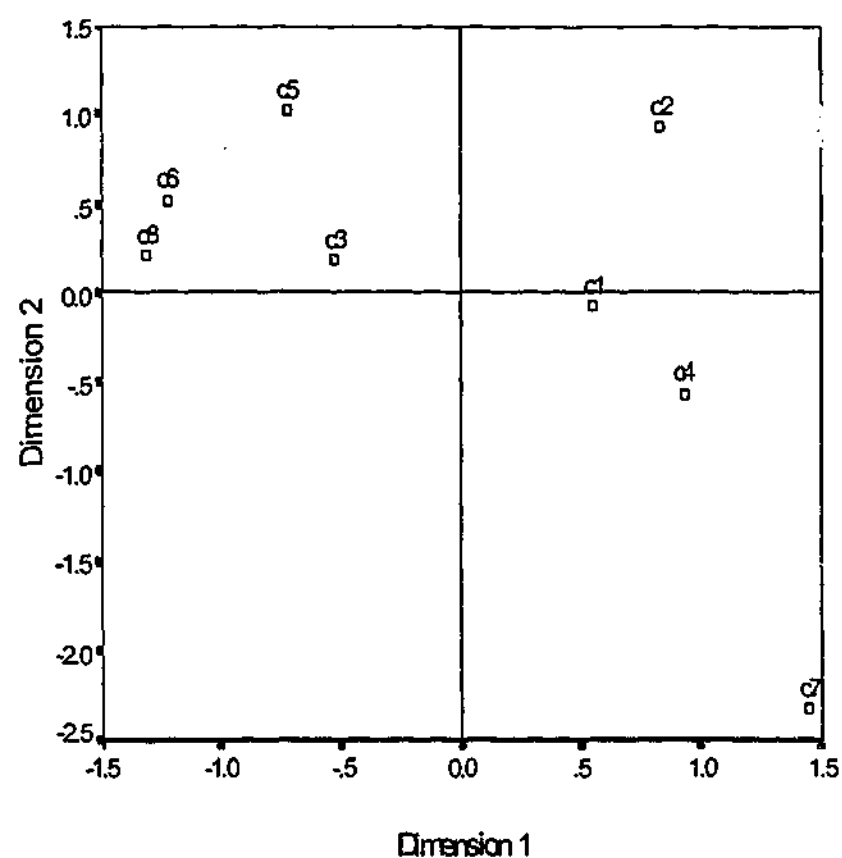
The model statistics for the reference configurations were good. It may be seen that as was usual the r-square is relatively low and the stress relatively high for the second occasion data when fitted to the reference configurations. However, the values for the index of angular variation did not reflect any change in the underlying structure.

As was mentioned above significant variations in the weight ratios are required before a change in structure is indicated. This is analogous to the interpretation of factor analysis results where changes in form are suggested by a change in the number of factors extracted and/or the percentage of variance explained by them.

The CMDS results for the two dimensional solutions were selected for interpretation. The construct and element maps are presented below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure A5.9: Construct Maps for Glen's Work-People Grid

### Commentary on the Construct Maps

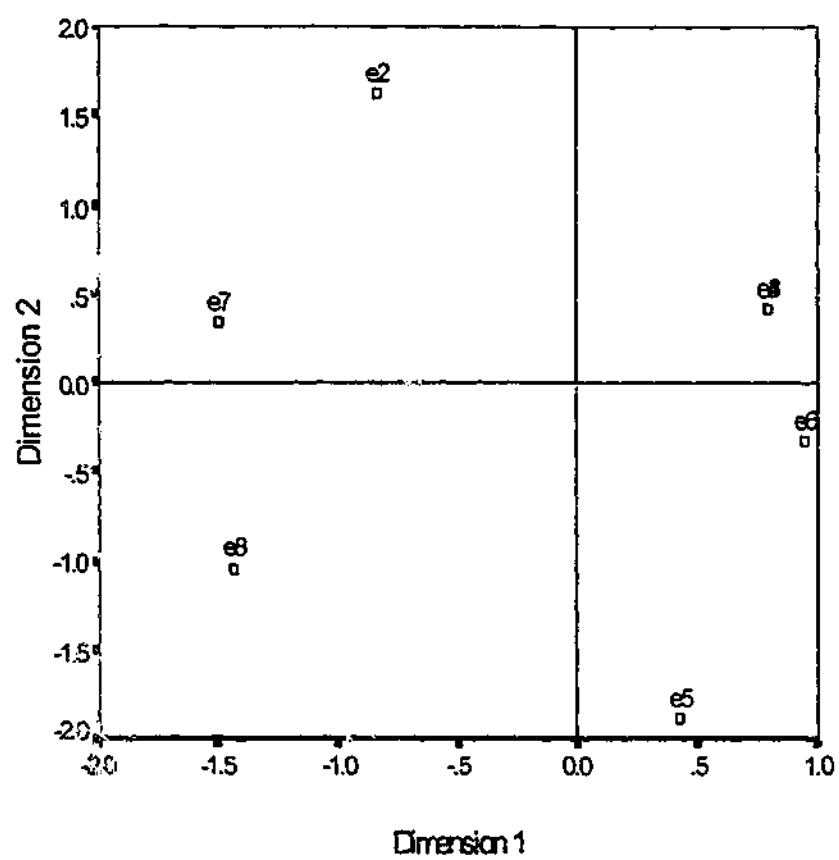
The dominant pattern in the first map is the cluster of constructs in the south-west quadrant. The cluster is reflective of Glen's construing of himself and close colleagues. The dominant theme in the cluster is one of friendliness and an easygoing manner. At first glance construct number six *Job satisfaction – Role model* appeared to be misplaced. However, this construct illustrated the congruence between Glen's personal style and his sense of job satisfaction in contrast to his superiors whom he construed as role models but also as fundamentally different from himself. These people were the shift manager, pit bosses and Mandy, the most successful work colleague nominated by Glen. At the first interview he provided a vignette of her as a fast tracker with a strong focus on material success.

What draws constructs three and five together is the similarity between Glen and his close colleagues. They were likeable because they shared the same attributes as him, one of these being ambition without being overconfident. This inference is supported by the coincidence of high ratings for Glen, Lana and Jane on these constructs. The contrast suggested by construct seven *Career – Money*, the isolate in the map, was the valuing of intrinsic versus extrinsic aspects of work. This again illustrated Glen's strong orientation towards people and towards those who were similarly inclined.

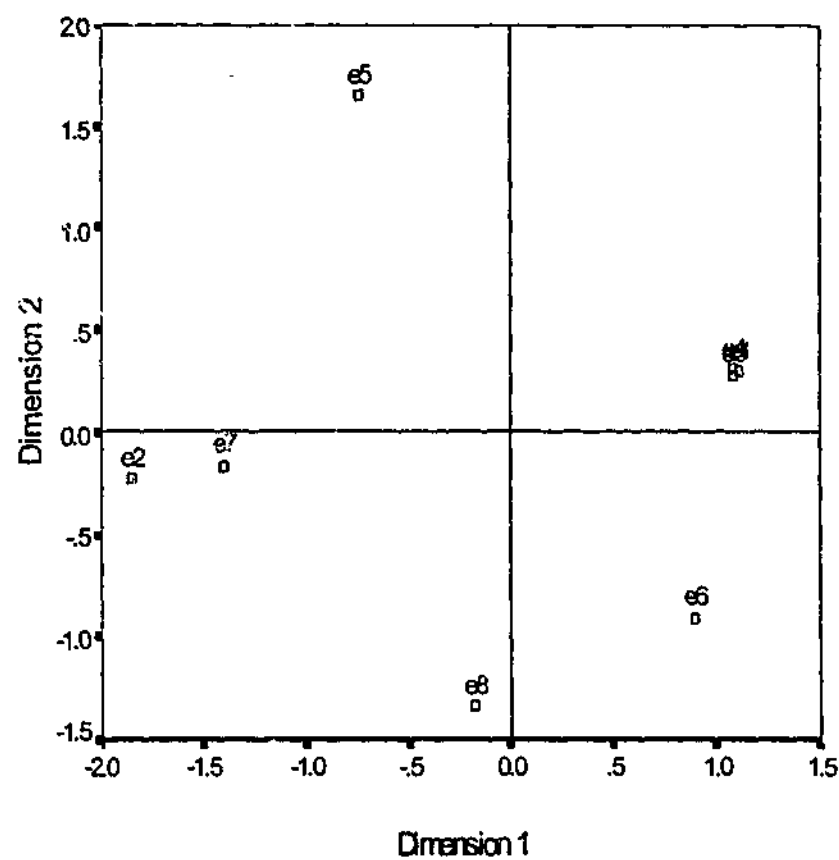
The distinguishing feature of the second map is that constructs six and eight, which were part of the cluster in the first map, are shown as proximate to one another but not near the cluster of constructs one, two and four. Again the triad in the north-east reflected the gregarious nature of Glen and his close colleagues as contrasted with the detached and impersonal style of his superiors who were more ambitious than he was. Construct seven was again isolated as a separate dimension of meaning.



It was expected that the element maps would indicate a partitioning of colleagues into those who Glen perceived to be like him and those who were fundamentally different in their orientation. These maps are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure A5.10: Element Maps for Glen's Work-People Grid

### **Commentary on the Element Maps**

The principal theme exemplified in both of the element maps is of Glen belonging to a core group of close colleagues who are clearly differentiated from others. In both maps this core group comprises Glen (e1), Lana (e3) and Jane (e4). It may be seen that in both maps this triad of elements is almost indistinguishable indicating the similarity between them. Situated nearby in both of the maps are patrons (e6). In the first map the shift manager (e2), the pit bosses (e7) and Mandy (e8) stand opposed to the core group. This configuration is repeated in the second map. This group were senior to Glen and also displayed different hallmarks in respect of their work attitudes. In both maps George (e5) is isolated. He was a person who was not liked by Glen. This is evidenced by the polar ratings of him on constructs three, five and seven in the first grid. The ratings in the second grid were almost identical. Thus, the element maps strongly support the initial interpretation of the grid.

### **The Nonwork-People Grid**

The third grid elicited from Glen is presented and evaluated below. This grid also demonstrated Glen's expressive personality and strong communion with those in his nonwork world.

Table A5.25: Glen's Nonwork-People Grid

Fuzzy Subsets Constructs/Elements	$\bar{E}_1$	$\bar{E}_2$	$\bar{E}_3$	$\bar{E}_4$	$\bar{E}_5$	$\bar{E}_6$	$\bar{E}_7$	$\bar{E}_8$	Implicit Poles
$\bar{C}_1$ : Female	1.0	0.9	0.3	0.5	0.0	0.7	0.3	0.4	Male
$\bar{C}_2$ : Nurturing	0.9	0.9	0.5	0.6	0.5	0.6	0.4	0.5	Thoughtfulness
$\bar{C}_3$ : Family	0.9	0.9	0.8	0.9	0.2	0.9	0.9	0.9	Non-family
$\bar{C}_4$ : Happy	0.9	0.8	0.6	0.8	0.1	0.8	0.7	0.8	Destructive
$\bar{C}_5$ : Complete	0.8	0.6	0.5	0.5	0.5	0.7	0.6	0.8	Wholesome
$\bar{C}_6$ : Strong	0.2	0.7	0.6	0.7	0.9	0.9	0.8	0.6	Worrier*
$\bar{C}_7$ : Caring	0.8	0.7	0.5	0.6	0.5	0.6	0.5	0.6	Similar*
$\bar{C}_8$ : Dedicated	0.8	0.7	0.6	0.8	0.2	0.8	0.2	0.8	Bad Habits
Element Types					Nominated People or Roles				
$e_1$ : (a person who is important to me)					Wife				
$e_2$ : (a person who is important to me)					Mother				
$e_3$ : (a person who I like)					Mark				
$e_4$ : (my ideal self)					My ideal self				
$e_5$ : (a person who I dislike)					Mr Eastman				
$e_6$ : (a person who I see frequently)					Joyce				
$e_7$ : (a person who I see frequently)					Jimmy				
$e_8$ : (myself as a father)					Myself as a father				

### Commentary on the Grid

This grid was noteworthy in a number of respects. It may be seen that the first construct *Female – Male* was not used to classify people according to their biological sex. Had this been the case then dichotomous ratings would have been used. Rather, this construct was used to infer something about the nature of the people under consideration. During the first interview a discussion ensued when Glen mentioned Mr Eastman as a person he disliked. It transpired that Glen had known Mr Eastman for many years. He had taken a strong dislike to him because of his uncaring treatment of his former wife.

It may be seen that on the construct *Female – Male*, Glen rated Mr Eastman as 0.0. In contrast, he rated his *my ideal self*, his father-in-law *Jimmy* and *myself as a father* as 0.5, 0.3 and 0.4 respectively. Thus, it may be inferred that Glen aligned *maleness* with aggressive uncaring behaviour. The discussion about Mr Eastman demonstrated Glen's strong concern about the welfare of others and his dislike of behaviour that was injurious to it. It was amply demonstrated by the content of this grid.

The second construct does not conform to Kelly's (1955) specification that the implicit pole is a contrast to the explicit pole. The construct as represented is an artifact of the elicitation process. The elements which were used to elicit it were *wife* ( $e_1$ ), *mother* ( $e_2$ ) and *my ideal self* ( $e_4$ ). Glen construed his wife and his mother as *Nurturing* and his ideal self in terms of *Thoughtfulness*. Thoughtfulness may be a characteristic of nurturing behaviour but it is not a contrast as such. When the second interview was conducted Glen was puzzled by the construct as expressed by him at the first interview. Following the procedure which had been devised to deal with such contingencies, he was asked whether the poles made sense to him as a dimension. He could not articulate a meaningful dimension. Therefore he was asked to construe each pole separately and to provide a contrasting pole for each if possible. This he could not do. Subsequently he was asked to use only the nominated poles as explicit anchors and to rate each of the elements against these.

The same difficulty arose again at the second interview when Glen attempted to rate the elements on the seventh construct. The protocol discussed above was also applied to deal with this. A difference between the second and the seventh construct is that in the case of the former each of the poles was recognised as meaningful.

In the case of the latter the question arose as to what *Similar* meant; similar in what respect(s). The term was used by Glen to draw a parallel between his wife and his mother-in-law Joyce. This was not an uncommon occurrence in the research. It was found that some participants construed their wives and their own mothers as similar whilst others construed their wives and their mothers as similar. The first observation reflects the well known figure of speech about 'men marrying their mothers' and the second another which can have the negative connotation 'you are just like your mother'.

In relation to this grid the term *Similar* was taken to reflect Glen's generalised construing of his wife and mother-in-law as similar in respect of a number of attributes valued by Glen. It may be seen that his wife and his mother-in-law were rated similarly on constructs two, four, five, and eight each of which comprised an underlying affect. A salient difference between them was observed in the ratings on the sixth construct. Glen construed his wife as a *Worrier*, in contrast to his mother-in-law whom he construed as *Strong*. It may also be seen from the ratings of his own mother that Glen construed her as very similar to his wife and his mother-in-law except on the sixth construct where his mother was construed as a worrier like his wife and therefore different to his mother-in-law. On the basis of Glen's self-descriptions, the interactions which the researcher had with him, and the ratings of his ideal self on the construct *Worrier* – *Strong*, it was inferred that Glen perceived himself to be somewhat of a worrier who would like to be strong. Thus the connotations behind strong here were not of physical strength or aggressiveness but of strength of character.

In summary, with the exception of the first construct, the explicit poles of the grid reflected the affective dimensions that Glen used to construe others. A continuity of

theme was evident between this and the other grids. This grid also showed Glen's strong people orientation.

The analytical results and the accompanying construct and element maps for this grid are shown below

**Table A5.26: Analytical Results for Glen's Nonwork-People Grid**

<i>First Occasion Grid</i>				
Construct Consensus	0.63			
Golden Section ratio	64:36			
Polarity Ratio	01:01			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.56	0.76	0.92
stress		0.38	0.21	0.10
Element Consensus	0.63			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.89	0.95	0.98
stress		0.36	0.15	0.07
<i>Second Occasion Grid</i>				
Construct Consensus	0.65			
Golden Section Ratio	65:35			
Polarity Ratio	05:08			
CMDS Results by Dimension(s) for Constructs		1	2	3
r-square		0.83	0.96	0.98
stress		0.34	0.16	0.08
Element Consensus	0.62			
CMDS Results by Dimension(s) for Elements		1	2	3
r-square		0.90	0.97	0.96
stress		0.41	0.12	0.06

### **Commentary on the Results**

The consensus coefficients for both occasion data were indicative of a relatively tight cognitive system. The magnitude of the coefficients was similar for the constructs and the elements and there was little variation between them across occasions. The values of the Golden Section Ratio conformed to theoretical expectations and reflected construing which was strongly positive and consistent. Polar construing was not a prominent feature of either grid.

For the constructs the r-square, and stress coefficients suggested a solution in three dimensions for the first occasion data and two dimensions for the second occasion data.

It can also be seen that for the second occasion data the r-square value was quite high for a unidimensional solution. However, the stress coefficient for that solution was also quite high. These patterns are illustrated in Figure A5.11 below.

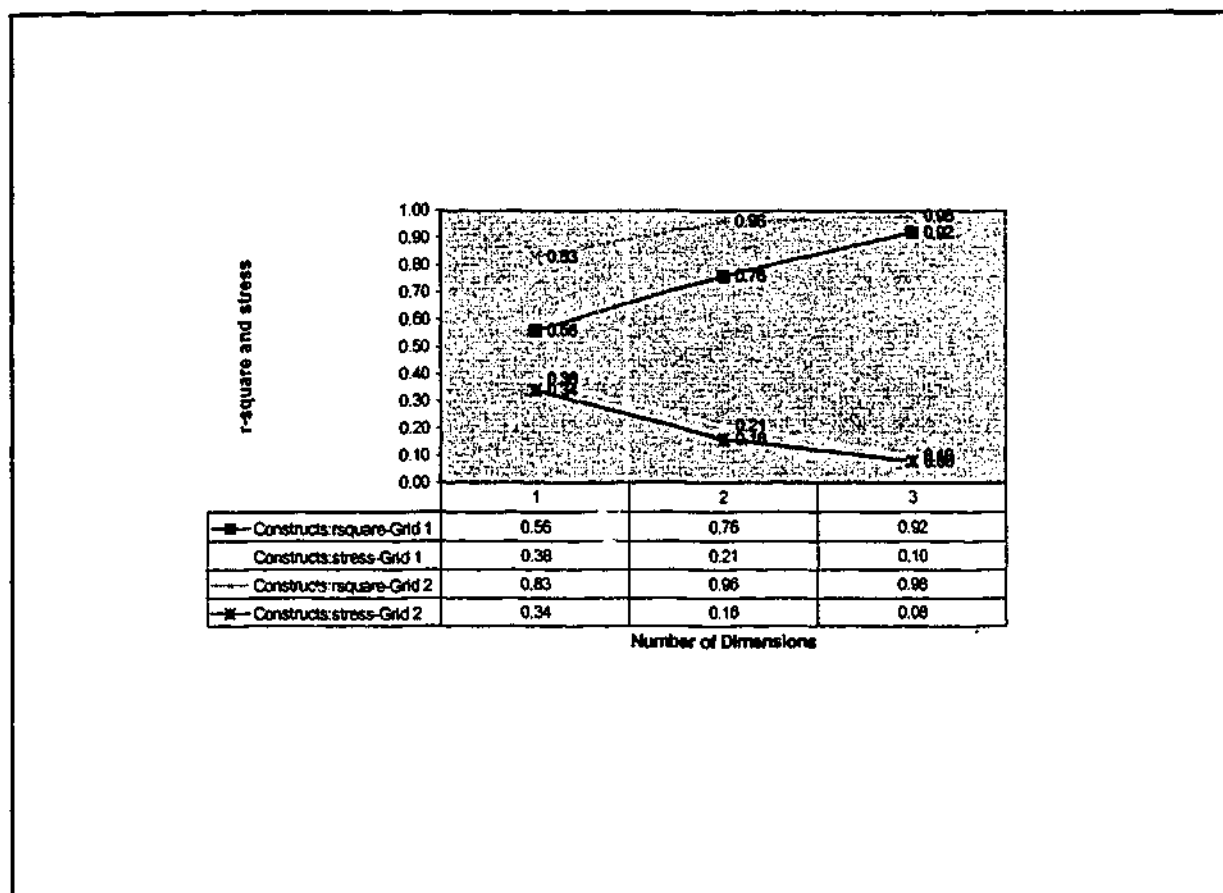


Figure A5.11: R-Square and Stress by Dimensionality (Constructs)

The figure shows that the gradients of the lines representing r-square (the lines at the top of the graph) are different, as are the gradients of the lines representing stress (the lines at the bottom of the graph). These differences show that for the first occasion data significant improvements in r-square (increases) and stress values (decreases) were associated with increasing dimensionality such that a three dimensional solution was indicated. For the second occasion data the change of gradient in the lines representing r-square and stress indicated a two dimensional solution.



It can also be seen that for the elements a two dimensional solution was indicated for both occasion data. As can be seen by the magnitude of the r-square coefficients the explanatory power of one dimension was very high for both occasions. However, the stress coefficients associated with the solutions in one dimension were also quite high. This is indicated by the limited slope for the lines representing r-square shown Figure A5.12 below.

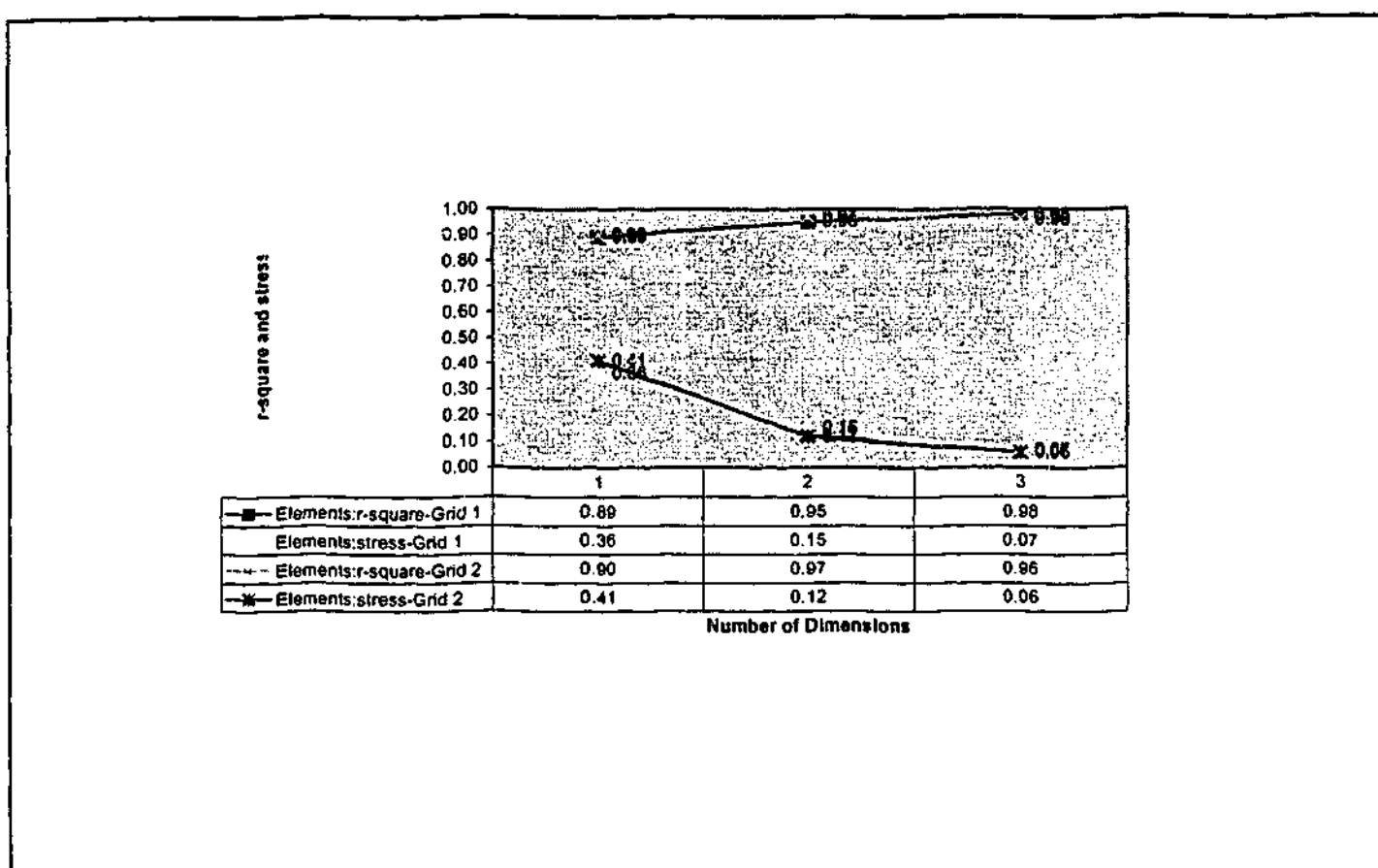


Figure A5.12: R-Square and Stress by Dimensionality (Elements)

The different dimensionality indicated for the constructs and the elements may seem anomalous and inconsistent. However what is represented here is an example of *loose duality* a concept that was elaborated in chapter 4.

Given the peculiarities of the solution statistics presented a decision about what dimensionality to use for the FPWMDS analysis was required. After evaluating the r-square and stress coefficients and weighing these against the issue of interpretability, it was decided to run solutions in two dimensions for both the constructs and the elements. In respect of both occasion data for the elements and the second occasion data for the constructs, this was not the most parsimonious solution. However, whilst the r-square values were enticing, the considerable magnitude of the stress coefficients for the one dimensional solutions swayed the researcher in favour of two dimensional solutions, which showed stress coefficients that were considerably lower and good r-square values. The only results which showed an r-square below 0.80 and a stress higher than 0.20 were those for the first occasion data for the constructs.

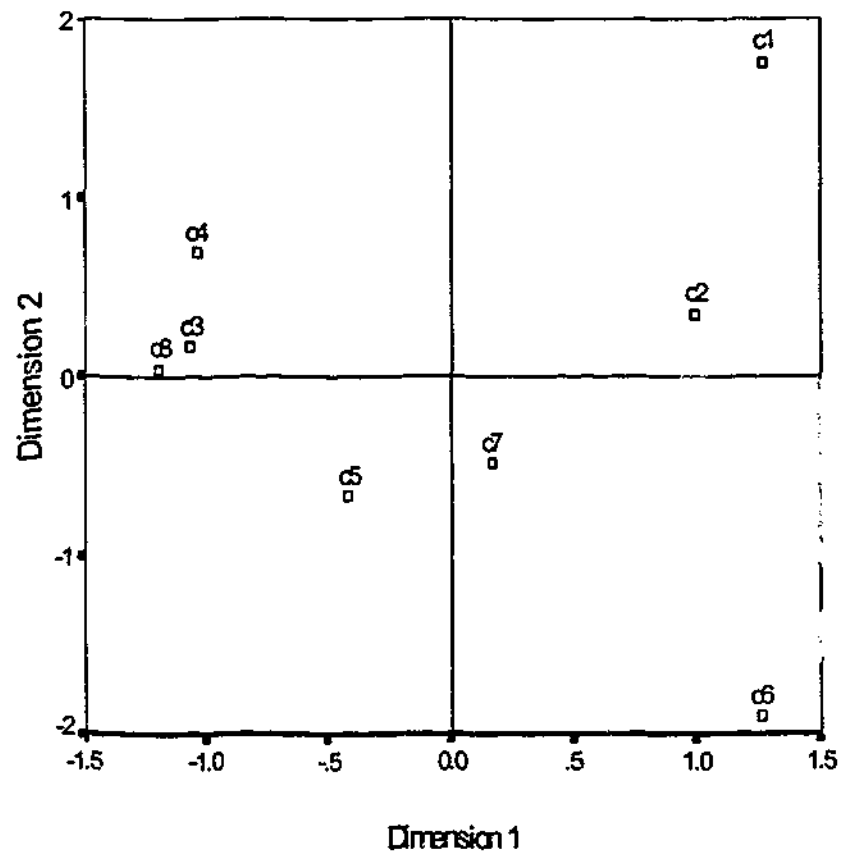
The results of the FPWMDS are shown below

**Table A5.27: FPWMDS Model Statistics for Glen's Nonwork-People Grid**

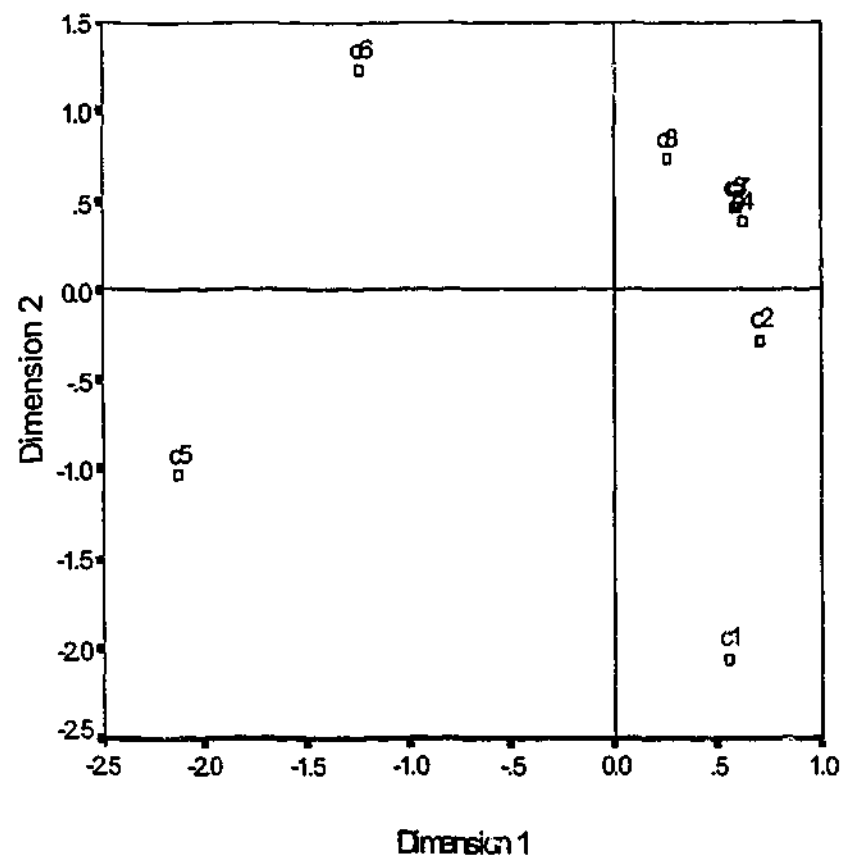
Configurations	R-square	Stress	Weight 1	Weight 2
<i>Constructs</i>				
Reference Configuration	0.76	0.22	0.73	0.48
Second Occasion Configuration	0.07	0.43	0.21	0.15
Index of Angular Variation = 0.00				
<i>Elements</i>				
Reference Configuration	0.95	0.15	0.89	0.40
Second Occasion Configuration	0.89	0.21	0.89	0.32
Index of Angular Variation = 0.00				

These results suggested that the form of the cognitive structure was unchanged and that the patterning of elements remained the same in the interval between the two interviews.

The construct maps are show below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure A5.13: Construct Maps for Glen's Nonwork-People Grid

### Commentary on the Construct Maps

In the introductory remarks about this grid, it was suggested that Glen appeared to use construct one *Female – Male* as more than a signifier of biological sex. Support for this premise may be found in the map by observing the proximity of this construct and construct two *Nurturing – Thoughtfulness*. That these are neighbours enhances the argument about Glen's construing of female as indicating a caring disposition. It may also be seen from the ratings for constructs one, two and six, that Glen rated his ideal self and himself as a father as representing a balance of masculine and feminine attributes. Glen's descriptions of his ideal self, reported earlier, support this interpretation. Each of them was a reference to an expressive quality. In the grid under consideration here Glen also used some of the same descriptors as well as some which were similes. For example, he used the terms *Family*, *Happy* and *Caring* which appear as the left poles of constructs three, four and seven. He also use the descriptors *Loving* and *Committed*, the former being related to *Nurturing* which is the explicit pole of the second construct and the latter being strongly related to the explicit pole of the eighth construct *Dedicated*. This triangulation evidence substantiated the inference that Glen's personality was *expressive-communal* rather than *agentic-individualist*.

Constructs five *Complete – Wholesome* and seven *Caring – Similar* lie very close together in the map. There is an intuitive appeal here, in that caring was bound up so closely with Glen's self-concept. It was expected to be a characteristic of a person construed by Glen as complete.

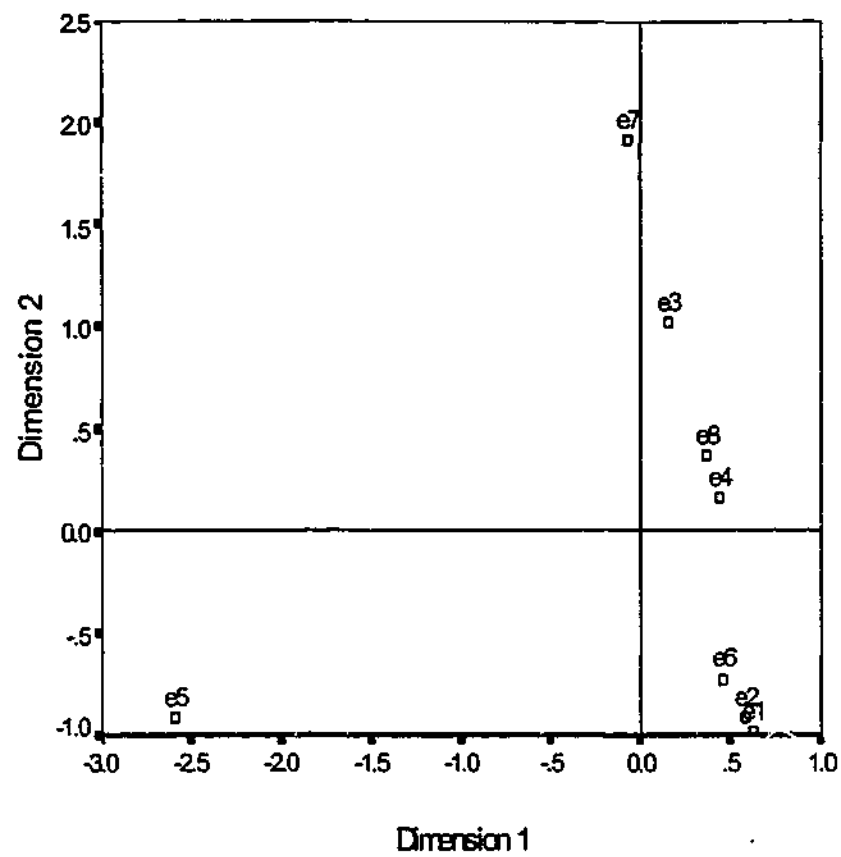
Constructs three *Family – Non-Family*, four *Happy – Destructive* and eight *Dedicated – Bad Habits* are in a cluster which demonstrated key values held by Glen. These values were a strong sense of family, being happy and constructive, and expressing the value

of family by being dedicated. They melded very well with the overall impression of Glen as a people-centered person.

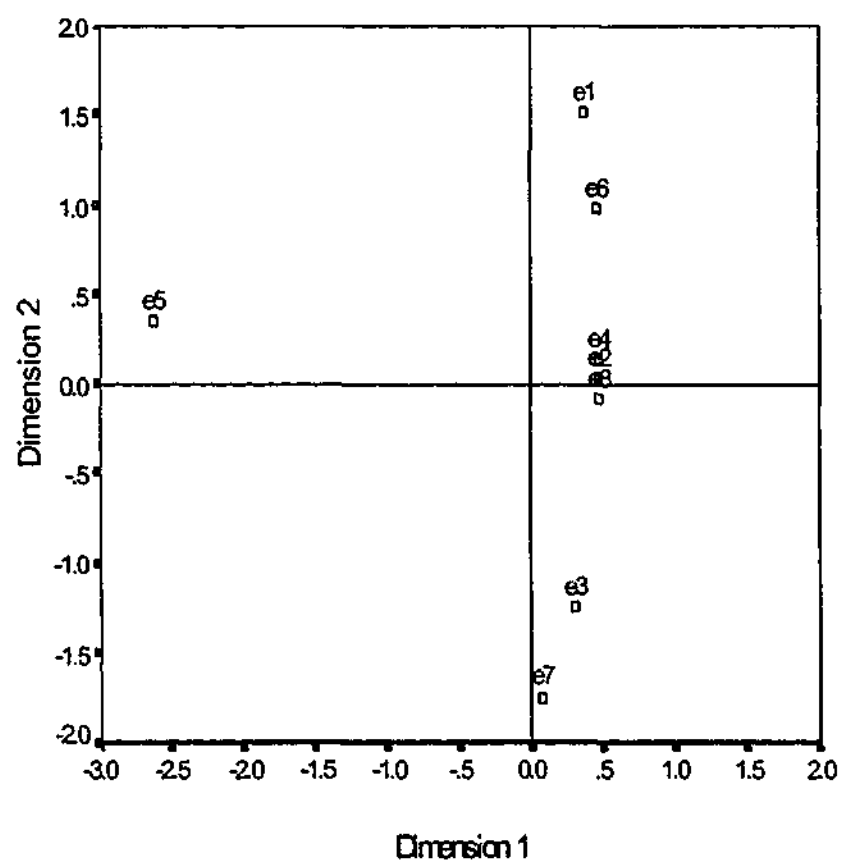
In the map the position of construct six *Strong – Worrier* was indicative of it as a separate dimension. Whilst on the one hand nurturing behaviour has a soft connotation and being strong has a hard connotation, it was earlier remarked that from Glen's point of view, strength was strength of character. It may be seen from the ratings in the grid that Joyce, Glen's mother-in-law, was construed as *Nurturing*. However she was also construed as *Strong*. This shows that the position of the sixth construct was not interpreted as indicating that the explicit pole *Strong* was an opposition to construct one *Female – Male* or construct two *Nurturing – Thoughtfulness* under the supposition that these represented a soft or weak nature.

The second map again showed the proximity of constructs one and two and the distinctiveness of the sixth construct. Whereas constructs five and seven were shown as a dyad in the first map, in the second one construct five was shown as an isolate and construct seven is related to a cluster in the north-east region of the map. This cluster represented Glen's strong sense of family. In summary, the second map was not inconsistent with the impression formed about Glen at the first interview. It demonstrated that his expressive disposition had become more pronounced over the period of the research.

The element maps are shown below.



First Occasion Reference Configuration



Second Occasion Configuration

Figure A5.14: Element Maps for Glen's Nonwork-People Grid

### **Commentary on the Element Maps**

The configuration of elements in the first map was consistent with the discussions which took place at the first interview and Glen's tone when he was speaking about Mr Eastman. He was the only person about whom Glen was negative and his feelings about him were acutely so. This negativity is illustrated in the map by the isolated position which element Mr Eastman (e5) occupies in the south-west corner of the map. The elements located in the south-east corner show Glen's similar construing of his intimates, who were his wife (e1), mother (e2) and mother-in-law (e6). The map also shows how Glen construed his ideal self and himself as a father (e4 and e8) in equivalent terms. Two people distinguished particularly because they were more masculine in their orientation were Mark, a good friend, and Jimmy, Glen's father-in-law.

The structure of the second map was the same as the first. It showed that Glen remained strongly connected with his intimates. He remained disaffected with Mr Eastman, whilst his construing of Mark and his Jimmy again reflected their differences to him and his intimates.

The analysis of this grid showed that Glen was strongly connected to all of those nominated in the nonwork domain except for Mr Eastman who was the antitheses of a caring orientation which was a primary constituent of Glen's personality. The grid showed again Glen's focus on people and relationships. However the affective quality and depth of Glen's relationships in the nonwork world was markedly different. The constructs in this grid were core constructs.

## Questionnaire Data —Glen

### Work and Nonwork

Work related data for Glen are shown below.

Table A5.28: Work Related Data for Glen

Variable	First Interview	Second Interview
Years of work experience	6-10	
Years with current employer	Less than 1	
Years with previous employer <sup>(a)</sup>	3-5	
Hours of work per week	31-40	41-50
Work at home		
Evenings	No	No
Weekends	No	No
Go to work at on weekends	Three times per month	Once per month
Job satisfaction	4	4
Occupational satisfaction	4	5
Organisational satisfaction	3	2
Job commitment	4	5
Occupational commitment	4	5
Organisational commitment	2	4

(a) Data reported in the first three rows were collected at the first interview only.

These data show that Glen's work was not as demanding in terms of the hours required as it was for other participants in the research. When first interviewed he was working less than forty hours per week but he had increased his working hours by the time the second interview was conducted. His wife was not working at that time. Whilst he tended to work at the weekends before the baby was born he did so less frequently after the birth.

When asked to indicate what he would do if he had enough money to live as comfortably as he would like for the rest of his life Glen indicated that he would not work at all. In relation to work needs, the first of four needs nominated by him was money, followed by job satisfaction, enjoyment and advancement. Whilst Glen was not asked to



rank these responses they suggested that work was viewed as important for material comfort but not central to Glen's life.

In terms of satisfaction measures Glen indicated some dissatisfaction with the casino on the first occasion and was not very satisfied with the Government authority for which he worked when interviewed on the second occasion. However the commitment reported to job and occupation was 'totally committed'. This may have been a function of his total responsibility for earning income after the birth of the baby but may also have been associated with commencing a new job. At the first interview it was reported by Glen that his wife had no plans to return to the workforce after the birth of the baby.

#### **Distinguishing Between Work and Nonwork**

Glen described the similarities between work and nonwork as 'talking and listening to people and generally being in a happy environment' He described leisure as 'anything that is not connected with work'. For him gardening was the activity in which he found solace.

## Household Work

Glen's self reported contributions domestic work are shown below

**Table A5.29: Glen's Contributions to Household Work**

Tasks	First Interview	Second Interview
<i>Traditional Feminine</i>		
Clothes washing	0.00	0.00
Grocery shopping	2.50	5.00
Cleaning	0.00	0.00
Ironing	0.00	0.00
Cooking the evening meal	0.00	4.00
<i>Subscore</i>	2.50	9.00
<i>Traditional Masculine</i>		
Gardening	2.50	2.00
House maintenance	2.50	2.50
<i>Subscore</i>	5.00	4.50
<i>Androgynous</i>		
Budgeting	5.00	5.00
Paying bills	7.50	7.50
Negotiations with external agencies	2.50	2.00
<i>Subscore</i>	15.00	14.50
<i>Total Score<sup>(a)</sup></i>	22.50	28.00
Satisfaction with the division of household work	5	5

(a) The maximum achievable total score was 57.5 made up of the sub-score maximums of 37.5 for traditional feminine tasks, 5.0 for traditional masculine tasks and 15.00 for androgynous tasks.

The first round data showed that Glen's contribution to the repetitive tasks was minimal. He was typical of most respondents in that he was responsible for less routine tasks such as gardening and maintenance. He was solely responsible for the financial affairs of the family and negotiations with external agencies. The second round data show similar scores across each category. It was thought that Glen's low contribution to unpaid work, evident in the first round data, may have been due to the fact that he and Rona were living at her parents whilst they were renovating their own home. However, although they had moved into their home at the time of the second interview, Glen's scores remained very similar. A conclusion based on a number of indicators including Glen's and Rona's educational level and cultural factors pointed to a division of household work along traditional lines. It was reported above that Rona did not plan to return to the workforce.

## The Transition to Fatherhood

### Prospective View

When asked about the changes that he anticipated once the baby was born, Glen wrote that his leisure time would be reduced and that there would be a financial loss since only he would be working. This suggested that theirs would be a traditional family. Glen also remarked that by becoming a parent he would have a greater understanding and appreciation of his own parents and closeness to his wife. Thus Glen's responses were both pragmatic and personal.

### Retrospective View

Glen was brief in describing the changes in his life after the baby was born. His responses were:

- Restrictions on social life;
- Financial constraints.

His responses were congruent with his expectations prior to the birth of the baby.

### Descriptions of Self as a Father

When Glen was asked to describe himself as a father his responses were as shown below.

Table A5.30: Glen's Descriptions of Self as a Father

Word/Phrase	Ranking	Rating
Loving	1	8
Committed	2	10
Caring	3	7
Understanding	4	8
Tolerable	5	7
Happy	6	9
Care-free	7	9
Family	8	6

These descriptors repeated the theme of care and concern for others and a happy disposition that was evident when Glen related his constructs about those in his work

and nonwork world. The terms *caring*, *happy* and *family* appeared again in these descriptions further reinforcing a view of Glen as an expressive person. This personal style transcended the work and nonwork domains.

### Babycare

Glen's reported contributions to babycare are shown below

**Table A5.31: Glen's Contributions to Babycare**

Task	Score <sup>(a)</sup>
Changing nappies	7.50
Bathing	3.00
Night tending	6.00
Play	5.00
Taking the baby for a stroll	3.00
Giving partner time alone	8.00
Total Score	32.50

(a) The maximum achievable score was 50.

Glen's contribution to the care of the baby was high relative to the other contributions that he made to unpaid work. His overall score was typical of the mean score of 32.34 for the participant group.

## Relationship Issues

### Relationship Characterisation and Role Salience

Data pertaining to relationship characterisation and role salience are shown below

**Table A5.32: Relationship and Role Salience Data for Glen**

Variables	First Interview	Second Interview
<i>Relationship Characterisation</i>		
Romance	3	6
Friendship	9	4
Partnership	3	5
<i>Ranking of Roles</i>		
Career	3	3
Marriage	1	2
Family life	2	1
Leisure	4	4
<i>Role Salience Subscales<sup>(a)</sup></i>		
Career		30
Marriage		37
Parenting		42
Home		30

(a) These data were collected only at the second interview. In relation to the subscales the maximum achievable individual score was 50.

These data show that, in terms of relationship characterisation, friendship was the dominant element on both occasions, but that the degree of dominance was reduced on the second occasion and reflected in an increase in the partnership dimension. On both occasions Glen ranked his career below marriage and family which were ranked first and second and conversely on the second occasion. The role salience scores also showed the primacy of marriage and family. However his parenting salience score was typical of the mean of 44 for the participant group. It was observed that only two participants scored less than forty on the parenting salience sub-scale.

## Marital Satisfaction

Marital satisfaction data reported by Glen is shown below.

Table A5.33: Glen's Marital Satisfaction Levels and Spouse Relations

Item	First	Second
Miserable/Enjoyable <sup>(a)</sup>	6	6
Hopeful/Discouraging	6	5
Free/Tied Down	4	4
Empty/Full	6	6
Interesting/Boring	5	7
Rewarding/Disappointing	6	7
Doesn't Give Me Much Chance/Brings out the Best in Me	6	6
Lonely/Friendly	6	6
Hard/Easy	5	3
Worthwhile/Useless	6	7
Overall Satisfaction	6	7
Relationship with Spouse <sup>(b)</sup>	12	

(a) Each item was rated on a seven-point scale. Items marked with an \* have been reversed scored.

(b) The maximum achievable individual score on this subscale was 35.

There were no indications in this data of any significant variation in relationship satisfaction between the first and second interviews. The spouse relations score was indicative of a mutually supportive relationship. At the second interview the tone in the household was one of contentment. Interactions with Rona and the baby suggested that the transition had been easy for both Glen and Rona.

## Parenting Stress and Related Measures

Parenting stress and other perceptions of stress reported by Glen are shown below.

**Table A5.34: Parenting Stress Measures for Glen**

Domain	Scores
<i>Child Characteristics Domain</i>	
Parent reinforcement	10
Child mood	9
Child adaptability	22
<i>Domain Score</i>	41
<i>Parent Characteristics Domain</i>	
Competence	15
Attachment	8
Restrictions	21
Isolation	11
Relationship with spouse	12
Parental health	14
<i>Domain Score</i>	81
<b>Parenting Stress Index Score</b>	<b>122</b>

**Table A5.35: Stress Ratings Reported by Glen**

Item	Rating
Difficulty of transition to fatherhood <sup>(a)</sup>	2
Stress as a result of becoming a father	2
Stress from work pressures	5
Relationship stress	1
Overall stress since the birth of the baby	3

(a) All items rated on 7 point Likert Scale. High scores are indicative of perceptions of high stress.

### Commentary

Glen indicated that he and Rona had talked about having a child within two years. Whilst they were not using contraception but 'playing it safe', both of them were delighted when the pregnancy was confirmed. Thus, although the baby was not planned as such, there were no misgivings about the impending birth.

The score on the parenting stress index was well below the benchmark considered as indicative of significant stress. Only one of the sub-scale scores reached the threshold score set as indicative of some difficulty. That was the score on the reinforcement from child sub-scale. A review of the ratings on this sub-scale indicated that one extreme response inflated the score. That was Glen's perception that his child smiled much less

than he expected. Other self-report indicators corroborated the low parenting stress score. Glen reported minimal stress associated with the transition to fatherhood, minimal stress associated with the role itself, and negligible relationship stress. His overall stress score in relation to the transition was low. The quality of Glen's experience was consistent with the salience that he attributed to his marriage and family life. His parenting salience score reflects this. It appeared that for him work was a secondary domain although as may be seen he reported significant work stress on the second occasion. He had changed jobs during the time interval between the first and second interview and was solely responsible for income earning after the birth. This combination of factors may explain the relatively high stress level reported in relation to work.

### **Summary of Glen and Rona's Case**

Glen, aged twenty-eight, was one of the younger participants in the research. He was also notable because he had not pursued higher education or professional training. This was one reason why the fabric of his "career" was significantly different to most of the other participants in the research. Whilst he spoke of advancement at work Glen had set no clear short or long term career goals. However, since he did not present as an instrumental person it was not surprising that he manifested less ambition than participants such as Len. In terms of personality and orientation Glen was like John but more outgoing than him. Moreover, it appeared that John's personal history had magnified his desire to become a father and parent such that his attention to the role was intense. Glen in contrast was strongly connected to the role but less intense. One indicator of this was the differences between them in relation to their contribution to baby care. John's score of forty-five was markedly higher than Glen's. There were



indications that this had caused some problems for John. He rated the stress level associated with becoming a father as six on a seven-point scale. Glen, in contrast, rated himself at two. However, whilst John may have experienced some difficulties because of his intensity in connection with fatherhood, there were some indications that Glen may face difficulties in regard to employment.

This completes the presentation of the case studies in this appendix.

## **APPENDIX VI**

### **QUESTIONNAIRES AND FORMS**

This appendix contains the Explanation and Consent Form and the two questionnaires used for the research. Also included is a facsimile of the repertory grid forms used and a sample of the ellipse that was designed and produced for use in conjunction with those forms.

## MONASH UNIVERSITY AND THE X HOSPITAL

### EXPLANATION AND CONSENT FORM

1. Title of project: Men, Work, Family, Leisure and the Transition to Fatherhood

2. Names of Chief Researchers: (i) Mr Alastair Anderson  
(ii) Associate Professor Michael Knowles

#### 3. General Purposes, Methods, Demands and Benefits:

**Purposes of the Study:** This study is part of the field work for my doctorate. My field of study is Organisational Behaviour. I am enrolled in the Department of Management in the Faculty of Business and Economics at Monash University (Clayton campus). My supervisor is Associate Professor Mike Knowles. The main purpose of my study is to research the way in which men invest in their work, family and leisure roles and how the birth of the first baby affects this. There has been little research done in this area. However, it is an important issue for couples and for human resources management in organisations.

**Methods:** In order to carry out this study I will need to meet with you on two occasions as follows:

Meeting 1: In the last three months of the pregnancy.

Meeting 2: At approximately six months after the birth of your baby.

There will also be a need for some phone conversations to make dates and times which are convenient for you.

At each time we meet the session will take approximately two hours. You will be asked to fill out a questionnaire and this should take forty minutes. I will then conduct an interview with you. With your consent I would like to tape-record the interviews. So in total I am asking for about four hours of your time if you can manage it.

My study does not involve any communications with the hospital except to get volunteers for the project. The only information which I will receive is the information which you provide to me during the course of the project.

You can be assured that this information will be anonymous and I will keep it to myself. It will not be possible to identify you by means of the questionnaires, the interview tapes or in any part of my thesis. I will keep all of the information which you provide in a locked cabinet when I am not using it. I am required to keep the questionnaires and the tapes for a period of five years. After that time and when I have finished with the information I will shred the questionnaires and erase the tapes. I will have an appropriate person witness this process. You should also know that my project has been approved by the Research and Ethics Committee at The X Hospital and The Standing Committee on Ethics in Research on Humans at Monash University. I am governed by and respect the ethical principles which these committees have laid down.

**Demands:** As indicated above the study will require about four hours of your time over a nine month period. I have designed the questionnaires and interviews so as to make it as easy as possible for you to complete them. I trust that it will not be a tiresome task.

**Benefits:** You may not benefit directly from this project. However my experience has shown that most men are very interested in the changes which they go through after the birth of their first child. It is a time of great change but it is also exciting, rewarding and challenging. I hope that my study will add to a fuller experience for you.

#### **4. Possible Risks, Inconveniences and Discomforts:**

**Risks and Discomforts:** The project does not involve any physical risk to you as such. However, during the period leading up to the birth and immediately after it I will be sensitive to the fact that your wife/partner and baby may be undergoing medical treatment and also that your time will be at a premium.

You may find the experience of completing the questionnaires unsettling. There are some questions in the questionnaire which concern aspects of your relationship with your wife/partner. These questions may raise issues which you feel you need to work through. If this is the case, then you can at your discretion contact Dr Y at The X Hospital For Women ( Z Street, Melbourne, Telephone -----).

**Inconveniences:** As I have indicated the time demand is four hours over two meetings in nine months. I will ensure that you are not inconvenienced in any way. I will arrange times and dates for meetings to suit you and I will bear the responsibility for arranging these things.

**5. Right to Refuse to Participate or Withdraw:** You have the right to refuse to participate in this project or to withdraw from participation at any time. If you refuse to participate or withdraw this will not disadvantage you in any way whatsoever.

**6. Contact with the Researcher:** If you need to contact me at any time or if you have any concerns before commencing, during or after completion of the project then you can contact me on the telephone numbers below shown below:

Alastair Anderson  
Telephone Work:  
Home:

**7. Results of the Study:** Naturally I will provide you with feedback on the study. You will be invited to any talks which I may give during or after the study is completed. You will have access to any papers which I publish and you may read my thesis if you wish.

**8. Should you have any complaint concerning the manner in which the research is conducted, please do not hesitate to contact The Standing Committee on Ethics in Research on Humans at the following address:**

The Secretary  
The Standing Committee on Ethics in Research on Humans  
Monash University  
Wellington Road  
Clayton Vic. 3168  
Telephone: (03) 905 2052  
Fax: (03) 905 5342

9. I have been asked to participate in the above mentioned research study and I give my consent by signing this form, on the understanding that the research study will be carried out in a manner conforming with the principles set out by the National Health and Medical Research Council.

9.1. I have read the attached explanation about the research project and I comprehend the general purposes, methods, demands and benefits and possible risks, inconveniences and discomforts of the study as outlined in the explanation.

9.2. My participation in the research is voluntary, and I am free to withdraw at any time.

9.3. The researcher has stated that he will keep the information which I supply to himself. The researcher is responsible for safeguarding the information and for ensuring that it is destroyed in an appropriate manner.

9.4. I have been given the opportunity to have a member of my family or a friend present while the project was explained to me.

9.5. Whilst reading the explanation and the consent form I have had the opportunity to ask questions.

9.6. The researcher has made it clear that if I do not choose to participate then this will have no adverse consequences for me.

9.7. The researcher has explained to me that the research project may not benefit me directly.

9.8. The researcher has explained to me that if the project raises issues which I need to discuss further, he can put me in contact with Dr Y at The X Hospital.

9.9. I am free to agree or to disagree to have the interviews for the research tape recorded. If they are tape recorded they will be anonymous and the researcher will be responsible for safeguarding them.

Signature: -----

Date: ----/----/----

10. I, -----, being the researcher named in 2 (i) above, certify that I have explained the nature and object of the investigations and have made it clear that declining to participate would bear no adverse consequences.

## THE FIRST QUESTIONNAIRE

## MONASH UNIVERSITY AND THE X HOSPITAL FOR WOMEN

Dear Participant

Thank you for agreeing to help me with my project.

This questionnaire has been designed as part of my doctoral study on how becoming a father affects work, family and leisure. The information which you provide will help me to better understand work, family and leisure in the 1990s. Because you are the one who can give me a picture of how you experience your work, family and leisure roles, I ask that you respond to the questions frankly and honestly.

You can be assured that I will keep the information to myself. I will not discuss it with or disclose it to anyone. It will not be possible to identify you from the questionnaire. However you will notice that the first page of the questionnaire has an identification number on it. This is because I will be seeing you again and I need to be able to combine the information which you give to me.

I will need to keep a list of names so that I can match these with the number on each questionnaire. I will keep this list separate place from the questionnaires and it will be locked away when I am not using it. Your questionnaires will be kept in a locked cabinet when I am not using them.

I am required to retain the questionnaires for a period of five years. When I have finished my research I will lock them away until that period of time has expired. After that time, I will shred them and I will have an appropriate person witness this and attest to the fact that they have been destroyed.

The information which I receive from participants will be reported in a summary form in my thesis. It will not be possible to identify you or any other person from the content of my thesis.

There are some close questions about your relationship with your wife/partner and your marriage/relationship in the questionnaire. Please answer these if you can. Again rest assured that I will keep your responses to myself and as I have already stated it will not be possible to identify your responses either from the questionnaire or in my thesis.

Once again thanks very much for the time which you are giving up to help me. I will supply you with ongoing information on the project and please feel free to contact me at any time.

Yours sincerely

Alastair Anderson

**MONASH UNIVERSITY AND THE X HOSPITAL**  
**MEN, WORK, FAMILY, LEISURE AND THE TRANSITION TO FATHERHOOD**

**Instructions and Explanations to Participants**

**Please read these instructions and explanations carefully before beginning to answer the questionnaire**

This questionnaire has three (3) sections. Please answer each section.

Please Note: In certain sections of this questionnaire you will see the terms *Job* and *Occupation* used. When you read the word *Job*, this means your actual job, that is what you actually do. When you read the word *Occupation*, this means your occupation by qualification, such as Builder, Secondary Teacher, Accountant, Lawyer etc. Please keep this in mind as you work through the questions.

Questionnaire Identification Number ----/----/----/----/



## SECTION 1

### Instructions

This section of the questionnaire concerns your occupation and your job. Please note that when reference is made to your *Job*, this means your present job. When reference is made to your *Occupation*, this means the occupation for which you were educated and/or trained.

1. How old are you in years?

	Years
--	-------

2. What is your occupation?

--

3. Tick a box for the highest level of education which you have achieved.

Completed up to or including Year 10 or equivalent	<input type="checkbox"/>
Completed Year 11 or equivalent	<input type="checkbox"/>
Completed Year 12 or equivalent	<input type="checkbox"/>
Completed Trade or TAFE qualification	<input type="checkbox"/>
Undergraduate Degree	<input type="checkbox"/>
Honours Degree	<input type="checkbox"/>
Masters Degree	<input type="checkbox"/>
Doctorate (PhD)	<input type="checkbox"/>

Please Note: For questions 4 to 14 inclusive tick one box only.

4. For how many years have you worked full-time since completing your education and or training? (That is your university degree or diploma, and/or trade or professional training if any)

Less Than 1 Year	<input type="checkbox"/>
1-2 Years	<input type="checkbox"/>
3-5 Years	<input type="checkbox"/>
6-10 Years	<input type="checkbox"/>
Over 10 Years	<input type="checkbox"/>

5. For how many years have you been employed with the organisation for which you are working at the moment? (If self-employed, answer as if you are working for an organisation.)

Less Than 1 Year	<input type="checkbox"/>
1-2 Years	<input type="checkbox"/>
3-5 Years	<input type="checkbox"/>
6-10 Years	<input type="checkbox"/>
Over 10 Years	<input type="checkbox"/>

6. For how many years did you work for your last employer? (If you did not have a previous employer then please go to Question 7)

Less Than 1 Year	<input type="checkbox"/>
1-2 Years	<input type="checkbox"/>
3-5 Years	<input type="checkbox"/>
6-10 Years	<input type="checkbox"/>
Over 10 Years	<input type="checkbox"/>

7. Are you currently working in the occupation for which you were educated and/or trained?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

8. In your previous job, were you employed in the occupation for which you were educated and/or trained.

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

9. Which description best matches your job status in the organisation for which you work at the moment.

Self-employed	<input type="checkbox"/>
Senior Management	<input type="checkbox"/>
Middle Management	<input type="checkbox"/>
Junior Manager	<input type="checkbox"/>
Non Managerial	<input type="checkbox"/>

10. Do you have a mortgage to pay?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

11. In a typical week how many hours would you work?

Less Than 20 Hours	<input type="checkbox"/>
20-30 Hours	<input type="checkbox"/>
31-40 Hours	<input type="checkbox"/>
41-50 Hours	<input type="checkbox"/>
51-60 Hours	<input type="checkbox"/>
61-70 Hours	<input type="checkbox"/>
More Than 70 Hours	<input type="checkbox"/>

12. Do you usually work at home at night?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

13. Do you usually work at home on the weekends?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

14. How often do you go to work on the weekends?

Never	<input type="checkbox"/>
Every Now and Then	<input type="checkbox"/>
Once a Month	<input type="checkbox"/>
Twice a Month	<input type="checkbox"/>
Three Times a Month	<input type="checkbox"/>
Every Weekend	<input type="checkbox"/>

For questions 15 to 20 inclusive place a circle around the number which best matches your response to the question:

15. All things considered, how satisfied are you with your present job?

Completely  
Satisfied

Completely  
Dissatisfied

5                      4                      3                      2                      1

16. All things considered, how satisfied are you with your present occupation?

Completely  
Satisfied

Completely  
Dissatisfied

5                      4                      3                      2                      1

17. All things considered, how satisfied are you with the organisation for which you work?  
If self-employed indicate how satisfied you are with this arrangement..

**Completely  
Satisfied**

**Completely  
Dissatisfied**

5

4

3

2

1

18. All things considered, how committed are you to your job?

**Totally  
Committed**

**Totally  
Uncommitted**

5

4

3

2

1

19. All things considered, how committed are you to your occupation?

**Totally  
Committed**

**Totally  
Uncommitted**

5

4

3

2

1

20. All things considered, how committed are you to your organisation? If self -  
employed indicate how committed you are to this way of working.

**Totally  
Committed**

**Totally  
Uncommitted**

5

4

3

2

1

21. How old is your wife/partner?

	Years
--	-------

22. What is her occupation?

--

23. Tick a box for the highest level of education which your  
wife/partner has achieved.

Completed up to or including Year 10 or equivalent	<input type="checkbox"/>
Completed Year 11 or equivalent	<input type="checkbox"/>
Completed Year 12 or equivalent	<input type="checkbox"/>
Completed Trade or TAFE qualification	<input type="checkbox"/>
Undergraduate Degree	<input type="checkbox"/>
Honours Degree	<input type="checkbox"/>
Masters Degree	<input type="checkbox"/>
Doctorate (PhD)	<input type="checkbox"/>

24. Which description best matches your wife/partner's job status in the organisation for which she works at the moment.

Self-employed	<input type="checkbox"/>
Senior Management	<input type="checkbox"/>
Middle Management	<input type="checkbox"/>
Junior Manager	<input type="checkbox"/>
Non Managerial	<input type="checkbox"/>

25. Does your wife/partner work full-time at the moment, that is 38 hours per week or more. (If you answer No to this question then please go to Question 27.)

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

26. Does your wife/partner intend to leave the full-time workforce for an extended period (that is longer than one month) when she has the baby?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

27. Tick a box which indicates the time at which you expect your wife/partner to return to full-time work following the birth of the baby.

Within 1 Month	<input type="checkbox"/>
Within 3 Months	<input type="checkbox"/>
In 3-6 Months	<input type="checkbox"/>
In 6-12 Months	<input type="checkbox"/>
In 12-18 Months	<input type="checkbox"/>
In 18-24 Months	<input type="checkbox"/>
When the Child Goes to Kindergarten	<input type="checkbox"/>
When the Child Goes to School.	<input type="checkbox"/>
Not in the Foreseeable Future	<input type="checkbox"/>

28. Do you intend to leave the full-time work force for an extended period (that is longer than one week) when your wife/partner has the baby?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

29. Tick a box which indicates the time at which you expect to return to full-time work following the birth of the baby.

Within 1 Week	<input type="checkbox"/>
Within 1 Month	<input type="checkbox"/>
Within 3 Months	<input type="checkbox"/>
In 3-6 Months	<input type="checkbox"/>
In 6-12 Months	<input type="checkbox"/>
In 12-18 Months	<input type="checkbox"/>
In 18-24 Months	<input type="checkbox"/>
When the Baby Goes to Kindergarten	<input type="checkbox"/>
When the Child Goes to School.	<input type="checkbox"/>
Not in the Foreseeable Future	<input type="checkbox"/>

## SECTION 2

### Instructions

This section concerns you, your non-work life and aspects of your relationship with your wife/partner. Please answer each question.

Please note: In this section *work* means your paid employment. *Non-work* means anything outside your paid employment including household activities, shopping and those activities which you regard as leisure.

30. Please write down 5 words or phrases which answer the question: *Who am I?*  
There are no right or wrong answers. Your own thoughts are all that is required here.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

31. Describe the similarities and differences between your work and non-work life?

---

---

---

---

---

---

---

---

32. How do you define leisure?

---

---

---

---

---

---

---

---

33. All things considered how satisfied are you with the amount of time you have to pursue your non-work activities with your wife/partner?

Completely  
Satisfied

Completely  
Dissatisfied

5

4

3

2

1

34. All things considered how satisfied are you with the amount of time you have to pursue your own non-work activities?

Completely  
Satisfied

Completely  
Dissatisfied

5

4

3

2

1

35. For how many years have you been married?

	<b>Years</b>
--	--------------

36. Did you live together before you were married?  
(If you answer **No** to this question then go to question 38.)

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

37. For how long did you live together before you were married?

	<b>Months</b>	<b>Years</b>
--	---------------	--------------

38. To answer this question imagine that you have 15 tokens, each of equal value. You can allocate these tokens in any way you wish to three categories which describe the nature of your relationship as husband/wife and partner/partner. The three categories are, *romance*, *friendship* and *partnership*. If you think that your relationship is totally romantic then you would allocate all of the 15 tokens to that category. If you think that your relationship is equal in terms of romance, friendship and partnership, then you would allocate 5 tokens to each category.

Write a number in the space next to each category which best indicates how you would describe your relationship at this point in time. Make sure that you allocate only 15 tokens in total across the three categories.

Category	Number of Tokens
Romance	
Friendship	
Partnership	

Please make sure that you have allocated only 15 tokens in total across the three categories.

39. For the following, circle the number which answers the question:

*During the past two weeks, how often did you:*

(a) Wash the clothes

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(b) Do the grocery shopping

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(c) Clean the house which means, vacuuming, mopping, dusting and general cleaning

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6



(d) Do the ironing

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(e) Cook the evening meal

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

40. Who does the gardening?

<b>Almost Always Me</b>		<b>Equally Responsible</b>		<b>Almost Always my Wife/Partner</b>
5	4	3	2	1

41. Who does repairs and maintenance around the house?

<b>Almost Always Me</b>		<b>Equally Responsible</b>		<b>Almost Always my Wife/Partner</b>
5	4	3	2	1

42. Who does the budgeting?

<b>Almost Always Me</b>		<b>Equally Responsible</b>		<b>Almost Always my Wife/Partner</b>
5	4	3	2	1

43. Who makes sure that the bills are paid?

<b>Almost Always Me</b>		<b>Equally Responsible</b>		<b>Almost Always my Wife/Partner</b>
5	4	3	2	1

44. Who does negotiations with Banks, the Local Council and other agencies when such situations arise?

<b>Almost Always Me</b>		<b>Equally Responsible</b>		<b>Almost Always my Wife/Partner</b>
5	4	3	2	1

45. All things considered how satisfied are you with the way the household work is divided up?

<b>Completely Satisfied</b>		<b>Completely Dissatisfied</b>
5	4	3
		2
		1

### SECTION 3

#### Instructions

This is the last section of the questionnaire. Please read any instructions which appear at the beginning any question before answering it.

46. The items below inquire about what kind of a person you think you are. Each item consists of a pair of characteristics with the letters A-E in between. For example:

Not at all artistic    A   B   C   D   E    Very artistic

Each pair describes contradictory characteristics — that is, you cannot be both at the same time, such as very artistic and not at all artistic. The letters form a scale between the two extremes. You are to choose a letter which describes where you fall on the scale. For example, if you think you have no artistic ability, you would choose A. If you think you are pretty good, you might choose D. If you are only medium, you might choose C, and so forth.

- |  |                   |  |
|--|-------------------|--|
| 1. Not at all aggressive                               | A   B   C   D   E | Very aggressive                          |
| 2. Not at all important                                | A   B   C   D   E | Very independent                         |
| 3. Not at all emotional                                | A   B   C   D   E | Very emotional                           |
| 4. Very submissive                                     | A   B   C   D   E | Very dominant                            |
| 5. Not at all excitable in a major crisis              | A   B   C   D   E | Very excitable in a major crisis         |
| 6. Very passive  | A   B   C   D   E | Very active                              |
| 7. Not at all able to devote self completely to others | A   B   C   D   E | Able to devote self completely to others |
| 8. Very rough  | A   B   C   D   E | Very gentle                              |
| 9. Not at all helpful to others                        | A   B   C   D   E | Very helpful to others                   |
| 10. Not at all competitive                             | A   B   C   D   E | Very competitive                         |
| 11. Very home oriented                                 | A   B   C   D   E | Very worldly                             |
| 12. Not at all kind                                    | A   B   C   D   E | Very kind                                |
| 13. Indifferent to others' approval                    | A   B   C   D   E | Highly needful others approval           |
| 14. Feelings not easily hurt                           | A   B   C   D   E | Feelings easily hurt                     |
| 15. Not aware of feelings of others                    | A   B   C   D   E | Very aware of feelings of others         |
| 16. Can make decisions easily                          | A   B   C   D   E | Has difficulty making decisions          |
| 17. Gives up very easily                               | A   B   C   D   E | Never gives up easily                    |
| 18. Never cries  | A   B   C   D   E | Cries very easily                        |
| 19. Not at all self-confident                          | A   B   C   D   E | Very self confident                      |
| 20. Feels very inferior                                | A   B   C   D   E | Feels very superior                      |
| 21. Not at all understanding of others                 | A   B   C   D   E | Very understanding of others             |
| 22. Very cold in relations with others                 | A   B   C   D   E | Very warm in relations with others       |
| 23. Very little need for security                      | A   B   C   D   E | Very strong need for security            |
| 24. Goes to pieces under pressure                      | A   B   C   D   E | Stands up well under pressure            |

47. The statements listed below describe attitudes toward the roles of women in society which different people have. There are no right or wrong answers; only opinions. You are asked to express your feeling about each statement by indicating whether you (A) agree strongly, (B) agree mildly, (C) disagree mildly or (D) disagree strongly. Please circle a response for each statement.

1. Swearing and obscenity are more repulsive in the speech of a woman than a man.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

2. Under modern economic conditions with women being active outside the home, men should share in household tasks such as washing dishes and doing the laundry.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

3. It is insulting to women to have the "obey" clause remain in the marriage service.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

4. A woman should be as free as a man to propose marriage.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

5. Women should worry less about their rights and more about becoming good wives and mothers.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

6. Women should assume their rightful place in business and all the professions along with men.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

7. A woman should not expect to go to exactly the same places to have quite the same freedom of action as a man.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

8. It is ridiculous for a woman to run a locomotive and for a man to darn socks.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

9. The intellectual leadership of a community should be largely in the hands of men.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

10. Women should be given equal opportunity with men for apprenticeship in the various trades.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

11. Women earning as much as their dates should bear equally the expense when they go out together.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

12. Sons in a family should be given more encouragement to go to college than daughters.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

13. In general, the father should have greater authority than the mother in the bringing up of children.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

14. Economic and social freedom is worth far more to women than acceptance of the ideal of femininity which has been set up by men.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

15. There are many jobs in which men should be given preference over women in being hired or promoted.

A	B	C	D
Agree strongly	Agree mildly	Disagree mildly	Disagree strongly

48. Now I would like you to think about your marriage/relationship life over the past two to three months, and use the following words and phrases to describe it. For example, if you think that your marriage/relationship during the last two months has been very miserable, circle the number (7) right next to the word "miserable". If you think it has been very enjoyable, circle the number (1) right next to "enjoyable". If you think it has been somewhere in between, select the number between 1 and 7 that is appropriate and circle it.

Be sure to circle one number on every line.

1. Miserable	7	6	5	4	3	2	1	Enjoyable
2. Hopeful	7	6	5	4	3	2	1	Discouraging
3. Free	7	6	5	4	3	2	1	Tied down
4. Empty	7	6	5	4	3	2	1	Full
5. interesting	7	6	5	4	3	2	1	Boring
6. Rewarding	7	6	5	4	3	2	1	Disappointing
7. Doesn't give me much chance	7	6	5	4	3	2	1	Brings out the best in me
8. Lonely	7	6	5	4	3	2	1	Friendly
9. Hard	7	6	5	4	3	2	1	Easy
10. Worthwhile	7	6	5	4	3	2	1	Useless

11. All things considered, how satisfied or dissatisfied have you been with your marriage/relationship over the last two months. Circle the number that best describes how satisfied you have been.

Completely Satisfied	7	6	5	4	3	2	1	Completely Dissatisfied
			Neutral					

49. Think about your current job. Indicate how important each of the following are by circling an appropriate response.

	Very Importat	Somewhat Important	Slightly Important	Not Very Important	Not at all Important
1. The prestige that goes with my job.	5	4	3	2	1
2. The prospects for advancement in my job.	5	4	3	2	1
3. A high level of income.	5	4	3	2	1
4. Using my abilities in my job.	5	4	3	2	1
5. The opportunity to be creative in my job.	5	4	3	2	1
6. The opportunity to be helpful to others through my job.	5	4	3	2	1
7. Working with people rather than things.	5	4	3	2	1

50. Rank the following in terms of importance to you. A rank of one (1) means most important. A rank of four (4) means least important.

Your work life	<input type="checkbox"/>
Your marriage/relationship	<input type="checkbox"/>
Your family life	<input type="checkbox"/>
Your leisure activities	<input type="checkbox"/>

51. In relation to your work, what are your needs?

---

---

---

---

---

---

---

---

52. In relation to your marriage/relationship, what are your needs?

---

---

---

---

---

---

---

---

53. In relation to your leisure, what are your needs?

---

---

---

---

---

---

---

---

---

---

54. When you think about being a father, what are your needs?

---

---

---

---

---

---

---

---

---

---

55. Did you plan for this baby? YES NO  
Please elaborate if you wish.

---

---

---

---

---

---

---

---

---

---

56. What changes do you anticipate once the baby is born?

---

---

---

---

---

---

---

---

---

---

**THIS IS THE END OF THE QUESTIONNAIRE.**

**I KNOW THAT THIS HAS BEEN A LONG QUESTIONNAIRE. THANKS VERY MUCH FOR  
TAKING THE TIME TO COMPLETE IT. CAN YOU TAKE JUST A MINUTE OR SO TO CHECK  
THAT YOU HAVE ANSWERED ALL OF THE QUESTIONS WHICH ARE RELEVANT TO YOU.**

**ONCE AGAIN THANKS VERY MUCH.**



**THE SECOND QUESTIONNAIRE**

**MONASH UNIVERSITY AND THE X HOSPITAL**  
**MEN, WORK, FAMILY, LEISURE AND THE TRANSITION TO FATHERHOOD**

**Instructions and Explanations to Participants**

***Please read these instructions and explanations carefully before beginning to answer the questionnaire***

*This questionnaire has three (3) sections. Please answer each section.*

*Please Note:* *In certain sections of this questionnaire you will see the terms Job and Occupation used. When you read the word Job, this means your actual job, that is what you actually do. When you read the word Occupation, this means your occupation by qualification, such as Builder, Secondary Teacher, Accountant, Lawyer etc. Please keep this in mind as you work through the questions.*

Questionnaire Identification Number ----/----/----/----/----

## SECTION 1

### Instructions

This section of the questionnaire concerns your occupation and your job. Please note that when reference is made to your *Job*, this means your present job. When reference is made to your *Occupation*, this means the occupation for which you were educated and/or trained.

1. In a typical week how many hours would you work?

Less Than 20 Hours	<input type="checkbox"/>
20-30 Hours	<input type="checkbox"/>
31-40 Hours	<input type="checkbox"/>
41-50 Hours	<input type="checkbox"/>
51-60 Hours	<input type="checkbox"/>
61-70 Hours	<input type="checkbox"/>
More Than 70 Hours	<input type="checkbox"/>

2. Do you usually work at home at night?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

3. Do you usually work at home on the weekends?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

4. How often do you go to work on the weekends?

Never	<input type="checkbox"/>
Every Now and Then	<input type="checkbox"/>
Once a Month	<input type="checkbox"/>
Twice a Month	<input type="checkbox"/>
Three Times a Month	<input type="checkbox"/>
Every Weekend	<input type="checkbox"/>

For questions 5 to 10 inclusive place a circle around the number which best matches your response to the question:

5. All things considered, how satisfied are you with your present job?

Completely  
Satisfied

Completely  
Dissatisfied

5                      4                      3                      2                      1

6. All things considered, how satisfied are you with your present occupation?

Completely  
Satisfied

Completely  
Dissatisfied

5                      4                      3                      2                      1

7. All things considered, how satisfied are you with the organisation for which you work? If self-employed indicate how satisfied you are with this arrangement.

Completely  
Satisfied

Completely  
Dissatisfied

5                      4                      3                      2                      1

8. All things considered, how committed are you to your job?

**Totally  
Committed**

**Totally  
Uncommitted**

5

4

3

2

1

9. All things considered, how committed are you to your occupation?

**Totally  
Committed**

**Totally  
Uncommitted**

5

4

3

2

1

10. All things considered, how committed are you to your organisation? If self-employed indicate how committed you are to this way of working.

**Totally  
Committed**

**Totally  
Uncommitted**

5

4

3

2

1

11. Is your wife/partner working at all at the moment? (If you answer No to this question then please go directly to question 13)

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

12. Tick a box which indicates the usual number of hours per week which your wife/partner is working at the moment.

Less than 20 hours	<input type="checkbox"/>
20 to 30 hours	<input type="checkbox"/>
30 to 40 hours	<input type="checkbox"/>
More than 40 hours	<input type="checkbox"/>

## SECTION 2

### Instructions

This section concerns you, your non-work life and aspects of your relationship with your wife/partner. Please answer each question.

Please note: In this section *work* means your paid employment. *Non-work* means anything outside your paid employment including household activities, shopping and those activities which you regard as leisure.

13. All things considered how satisfied are you with the amount of time you have to pursue your non-work activities with your wife/partner?

Completely  
Satisfied

Completely  
Dissatisfied

5

4

3

2

1

14. All things considered how satisfied are you with the amount of time you have to pursue your own non-work activities?

Completely  
Satisfied

Completely  
Dissatisfied

5

4

3

2

1

15. To answer this question imagine that you have 15 tokens, each of equal value. You can allocate these tokens in any way you wish to three categories which describe the nature of your relationship. The three categories are, *romance*, *friendship* and *partnership*. If you think that your relationship is totally romantic then you would allocate all of the 15 tokens to that category. If you think that your relationship is equal in terms of romance, friendship and partnership, then you would allocate 5 tokens to each category.

Write a number in the space next to each category which best indicates how you would describe your relationship at this point in time. Make sure that you allocate only 15 tokens in total across the three categories.

Category	Number of Tokens
Romance	
Friendship	
Partnership	

Please make sure that you have allocated only 15 tokens in total across the three categories.

16. For the following, circle the number which answers the question:

*During the past two weeks, how often did you:*

(a) Wash the clothes

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(b) Do the grocery shopping

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(c) Clean the house which means, vacuuming, mopping, dusting and general cleaning

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(d) Do the ironing

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(e) Cook the evening meal

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

17. Who does the gardening?

Almost Always Me		Equally Responsible		Almost Always my Wife
5	4	3	2	1

18. Who does repairs and maintenance around the house?

Almost Always Me		Equally Responsible		Almost Always my Wife
5	4	3	2	1

19. Who does the budgeting?

Almost Always Me		Equally Responsible		Almost Always my Wife
5	4	3	2	1



20. Who makes sure that the bills are paid?

**Almost  
Always Me**

**Equally  
Responsible**

**Almost Always my  
Wife**

5

4

3

2

1

21. Who does negotiations with Banks, the Local Council and other agencies when such situations arise?

**Almost  
Always Me**

**Equally  
Responsible**

**Almost Always my  
Wife**

5

4

3

2

1

22. All things considered how satisfied are you with the way the household work is divided up?

**Completely  
Satisfied**

**Completely  
Dissatisfied**

5

4

3

2

1

### SECTION 3

#### Instructions

Please read any instructions which appear at the beginning any question before answering it.

23. The following statements concern aspects of work/career, parenting, marriage/relationship and homecare roles. For each statement there are five possible responses as follows:

1. Disagree
2. Somewhat disagree
3. Neither agree Nor disagree
4. Somewhat Agree
5. Agree

For each statement circle a number which matches your response.

	Disagree	Somewhat	Neither Disagree Nor Disagree	Somewhat Agree	Agree
1. Having work/a career that is interesting and exciting to me is my most important life goal.	1	2	3	4	5
2. I expect my job/career to give me more real satisfaction than anything else I do.	1	2	3	4	5
3. Building a name and reputation for myself through work/a career is not one of my life goals.	1	2	3	4	5
4. It is important to me that I have a job/career in which I can achieve something of importance.	1	2	3	4	5
5. It is important to me to feel successful in my work/career.	1	2	3	4	5
6. I want to work, but I do not want to have a demanding career.	1	2	3	4	5
7. I expect to make as many sacrifices as are necessary in order to advance my work/career.	1	2	3	4	5
8. I value being involved in a career and expect to devote the time and effort needed to develop it.	1	2	3	4	5
9. I expect to devote a significant amount of my time to building my career and developing the skills necessary to advance in my career.	1	2	3	4	5
10. I expect to devote whatever time and energy it takes to move up in my job/career field.	1	2	3	4	5

	Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat	Agree
11. Although parenthood requires many sacrifices, the love and enjoyment of children of one's own are worth it all.	1	2	3	4	5
12. If I chose not to have children, I would regret it.	1	2	3	4	5
13. It is important to me to feel I am (will be) an effective parent.	1	2	3	4	5
14. The whole idea of having children and raising them is not attractive to me.	1	2	3	4	5
15. My life would be empty if I never had children.	1	2	3	4	5
16. It is important to me to have some time for myself and my own development rather than having children and be responsible for their care.	1	2	3	4	5
17. I expect to devote a significant amount of time and energy to the rearing of children of my own.	1	2	3	4	5
18. I expect to be very involved in the day-to-day matters of rearing children of my own.	1	2	3	4	5
19. Becoming involved in the day-to-day details of rearing children involves costs in other areas of my life which I am unwilling to make.	1	2	3	4	5
20. I do not expect to be very involved in child rearing.	1	2	3	4	5
21. My life would seem empty if I never married.	1	2	3	4	5
22. Having a successful marriage is the most important thing in my life.	1	2	3	4	5
23. I expect marriage to give me more real personal satisfaction than anything else in which I am involved.	1	2	3	4	5

	Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat	Agree
24. Being married to a person I love is more important than anything else.	1	2	3	4	5
25. I expect the major satisfaction in my life to come from my marriage relationship.	1	2	3	4	5
26. I expect to commit whatever time is necessary to making my marriage partner feel loved, supported and cared for.	1	2	3	4	5
27. Devoting a significant amount of my time to being with or doing things with a marriage partner is not something I expect to do.	1	2	3	4	5
28. I expect to put a lot of time and effort into building and maintaining a marital relationship.	1	2	3	4	5
29. Really involving myself in a marriage relationship involves costs in other areas of my life which I am unwilling to accept.	1	2	3	4	5
30. I expect to work hard to build a good marriage relationship even if it means limiting my opportunities to pursue other personal goals.	1	2	3	4	5
31. It is important to me to have a home of which I can be proud.	1	2	3	4	5
32. Having a comfortable and attractive home is of great importance to me.	1	2	3	4	5
33. To have a well-run home is one of my life goals.	1	2	3	4	5
34. Having a nice home is something to which I am very committed.	1	2	3	4	5
35. I want a place to live, but I do not really care how it looks.	1	2	3	4	5

	Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat	Agree
36. I expect to leave most of the day-to-day details of running a home to someone else.	1	2	3	4	5
37. I expect to devote the necessary time and attention to having a neat and attractive home.	1	2	3	4	5
38. I expect to be very much involved in caring for a home and making it attractive.	1	2	3	4	5
39. I expect to assume the responsibility for seeing that my home is well kept and well run.	1	2	3	4	5
40. Devoting a significant amount of my time and energy to managing and caring for a home is not something I expect to do.	1	2	3	4	5

24. Now I would like you to think about your marriage/relationship life over the past two to three months, and use the following words and phrases to describe it. For example, if you think that your marriage/relationship during the last two months has been very miserable, circle the number (7) right next to the word "miserable". If you think it has been very enjoyable, circle the number (1) right next to "enjoyable". If you think it has been somewhere in between, select the number between 1 and 7 that is appropriate and circle it.

**Be sure to circle one number on every line.**

1. Miserable	7	6	5	4	3	2	1	Enjoyable
2. Hopeful	7	6	5	4	3	2	1	Discouraging
3. Free	7	6	5	4	3	2	1	Tied down
4. Empty	7	6	5	4	3	2	1	Full
5. interesting	7	6	5	4	3	2	1	Boring
6. Rewarding	7	6	5	4	3	2	1	Disappointing
7. Doesn't give me much chance	7	6	5	4	3	2	1	Brings out the best in me
8. Lonely	7	6	5	4	3	2	1	Friendly
9. Hard	7	6	5	4	3	2	1	Easy
10. Worthwhile	7	6	5	4	3	2	1	Useless

11. All things considered, how satisfied or dissatisfied have you been with your marriage/relationship over the last two months. Circle the number that best describes how satisfied you have been.

Completely Satisfied                      Neutral                      Completely Dissatisfied

7      6      5      4      3      2      1

25. Rank the following in terms of importance to you. A rank of one (1) means most important. A rank of four (4) means least important.

Your work life	<input type="checkbox"/>
Your marriage	<input type="checkbox"/>
Your family life	<input type="checkbox"/>
Your leisure activities	<input type="checkbox"/>

26. Describe the changes that have occurred in your life since the baby was born?

---



---



---



---



---



---



---



---

27. For the following circle the number which answers the question:

*During the past two weeks, how often did you:*

- (a) Change the baby's nappies

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(b) Bath the baby

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(c) Get up to care for the baby during the night

Every Night  
Every Second Night  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(d) Play with the baby for an hour or more

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(e) Allow your wife/partner some free time alone

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6

(f) Take the baby for a stroll

Every Day  
Every Second Day  
Twice a Week  
Once a Week  
Once in Two weeks  
Not at All

1
2
3
4
5
6



**28. Directions:**

In answering the following questions, please think about your baby.

The question on the following pages ask you to mark an answer which best describes your feelings. While you may not find an answer which exactly states your feelings, please mark the answer which comes closest to describing how you feel. **YOUR FIRST REACTION TO EACH QUESTION SHOULD BE YOUR ANSWER.**

Please mark the degree to which you agree or disagree with the following statements by filling in the number which best matches how you feel. If you are not sure, please fill in #3.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

*Example:*    1    ②    3    4    5    I enjoy going to the movies. (If you sometimes  
enjoy going to the movies, you would fill in #2)

Some of the questions will ask you to circle an option rather than a scale.  
Do this where indicated.

	1 Strongly Agree	2 Agree	3 Not Sure	4 Disagree	5 Strongly Disagree
1. My child rarely does things that make me feel good.	1	2	3	4	5
2. Most times I feel that my child likes me and wants to be close to me.	1	2	3	4	5
3. Sometimes I feel my child doesn't like me and doesn't want to be close to me.	1	2	3	4	5
4. My child smiles at me much less than I expected.	1	2	3	4	5
5. Which statement best describes your child?					
1. almost always like to play with me.					
2. sometimes likes to play with me.					
4. usually doesn't like to play with me.					
5. almost never likes to play with me.					
6. My child cries and fusses:					
1. much less than I had expected.					
2. less than I expected.					
3. about as much as I expected.					
4. much more than I expected.					
5. it seems almost constant.					
7. My child seems to cry or fuss more often than most other children.	1	2	3	4	5
8. When playing, my child doesn't often giggle or laugh.	1	2	3	4	5
9. My child generally wakes up in a bad mood.	1	2	3	4	5
10. I feel that my child is very moody and easily upset.	1	2	3	4	5
11. When my child came home from hospital, I had doubtful feelings about my ability to handle being a parent.	1	2	3	4	5

	1 Strongly Agree	2 Agree	3 Not Sure	4 Disagree	5 Strongly Disagree
12. Being a parent is harder than I thought it would be.	1	2	3	4	5
13. I feel capable and on top of things when I am caring for my child.	1	2	3	4	5
14. My child has a great deal of difficulty in getting used to changes in schedules or changes around the house.	1	2	3	4	5
15. My child reacts very strongly when something happens that my child doesn't like.	1	2	3	4	5
16. Leaving my child with a baby sitter is usually a problem.	1	2	3	4	5
17. My child gets upset easily over the smallest things.	1	2	3	4	5
18. My child easily notices and overreacts to loud sounds and bright lights.	1	2	3	4	5
19. My child's sleeping or eating schedule was much harder to establish than I expected.	1	2	3	4	5
20. My child usually avoids a new toy for a while before beginning to play with it.	1	2	3	4	5
21. It takes a long time and it is very hard for my child to get used to new things.	1	2	3	4	5
22. My child doesn't seem comfortable when meeting strangers.	1	2	3	4	5
23. When upset, my child is:					
1. easy to calm down					
2. harder to calm down than I expected					
4. very difficult to calm down					
5. nothing I do helps to calm my child					

1	2	3	4	5
Strongly	Agree	Not	Disagree	Strongly
Agree		Sure		Disagree

---

24. I have found that getting my child to do something or stop doing something is:

1. much harder than I expected
2. somewhat harder than I expected
3. about as hard as I expected
4. somewhat easier than I expected
5. much easier than I expected

25. As a parent I can't make decisions without help.

1	2	3	4	5
---	---	---	---	---

26. I have had many more problems with my child than I expected.

1	2	3	4	5
---	---	---	---	---

27. I enjoy being a parent.

1	2	3	4	5
---	---	---	---	---

28. I feel that I am successful most of the time when I try to get my child to do or not do something.

1	2	3	4	5
---	---	---	---	---

29. I find that I am not able to take care of this child as well as I thought I could.

1	2	3	4	5
---	---	---	---	---

30. As a parent I often have the feeling that I cannot handle things very well.

1	2	3	4	5
---	---	---	---	---

31. When I think about myself as a parent I believe:

1. I can handle anything that happens
2. I can handle most things pretty well
3. sometimes I have doubts, but find that I handle most things without any problems
4. I have some doubts about being able to handle things
5. I don't think I handle things very well at all

32. I feel that I am:

1. a very good parent
2. a better than average parent
3. an average parent
4. a person who has some trouble being a parent
5. not very good at being a parent

1	2	3	4	5
Strongly	Agree	Not	Disagree	Strongly
Agree		Sure		Disagree

---

33. How easy is it for you to understand what your child wants or needs?

1. very easy
2. easy
3. somewhat difficult
4. it is very hard
5. I usually can't figure out what the problem is

34. It takes a long time for parents to develop close, warm feelings for their children.

1	2	3	4	5
---	---	---	---	---

35. I expected to have closer and warmer feelings for my child than I do and this bothers me.

1	2	3	4	5
---	---	---	---	---

36. When I was young, I never felt comfortable holding or taking care of children.

1	2	3	4	5
---	---	---	---	---

37. My child knows I am his or her parent and wants me more than other people.

1	2	3	4	5
---	---	---	---	---

38. Most of my life is spent doing things for my child.

1	2	3	4	5
---	---	---	---	---

39. I find myself giving up more of my life to meet my child's needs than I ever expected.

1	2	3	4	5
---	---	---	---	---

40. I feel trapped by my responsibilities as a parent.

1	2	3	4	5
---	---	---	---	---

41. I often feel that my child's needs control my life.

1	2	3	4	5
---	---	---	---	---

42. Since having this child I have been unable to do new and different things.

1	2	3	4	5
---	---	---	---	---

43. Since having a child I feel that I am almost never able to do things that I like to do.

1	2	3	4	5
---	---	---	---	---

44. It is hard to find a place in our home where I can go to be myself.

1	2	3	4	5
---	---	---	---	---

	1 Strongly Agree	2 Agree	3 Not Sure	4 Disagree	5 Strongly Disagree
45. Since having a child, my wife/partner has not given me as much help and support as I expected.	1	2	3	4	5
46. Having a child has caused more problems than I expected in my relationship with my wife/partner.	1	2	3	4	5
47. Since having a child, my wife/partner and I don't do as many things together.	1	2	3	4	5
48. Since having a child my wife/partner and I don't spend as much time together as a family as I expected.	1	2	3	4	5
49. Since having my child, I have had less interest in sex.	1	2	3	4	5
50. Having a child seems to have increased the number of problems we have with in-laws and relatives.	1	2	3	4	5
51. Having a child has been much more expensive than I had expected.	1	2	3	4	5
52. I feel alone and without friends.	1	2	3	4	5
53. When I go to a party I usually expect not to enjoy myself.	1	2	3	4	5
54. I am not as interested in people as I used to be.	1	2	3	4	5
55. I often have the feeling that other people my own age don't particularly like my company.	1	2	3	4	5
56. When I run into a problem taking care of my child I have a lot of people to whom I can talk or get help and advice.	1	2	3	4	5
57. Since having a child I have a lot fewer chances to see my friends and to make new friends.	1	2	3	4	5
58. During the past six months I have been sicker than usual or have had more aches and pains that I normally do.	1	2	3	4	5
59. Physically, I feel good most of the time.	1	2	3	4	5

1	2	3	4	5
Strongly	Agree	Not	Disagree	Strongly
Agree		Sure		Disagree

---

60. Having a child has caused changes in the way I sleep.

1                  2                  3                  4                  5

61. I don't enjoy things as I used to.

1                  2                  3                  4                  5

62. Since I've had my child:

- 1. I have been sick a great deal
- 2. I haven't felt as good
- 4. I haven't noticed any change in my health
- 5. I have been healthier

29. How difficult have you found the transition to fatherhood?

Very  
Difficult

Very  
Easy

7                  6                  5                  4                  3                  2                  1

30. How much stress have you felt as a result of becoming a father?

A Lot

Very  
Little

7                  6                  5                  4                  3                  2                  1

31. Since the baby was born how much stress have you felt as a result of work pressures?

A Lot

Very  
Little

7                  6                  5                  4                  3                  2                  1

32. Since the baby was born how much stress have you felt in connection with your relationship with your partner?

A Lot

Very  
Little

7                  6                  5                  4                  3                  2                  1

33. Since the baby was born how much stress do you feel overall?

A Lot

Very

Little

7

6

5

4

3

2

1

THIS IS THE END OF THE QUESTIONNAIRE.

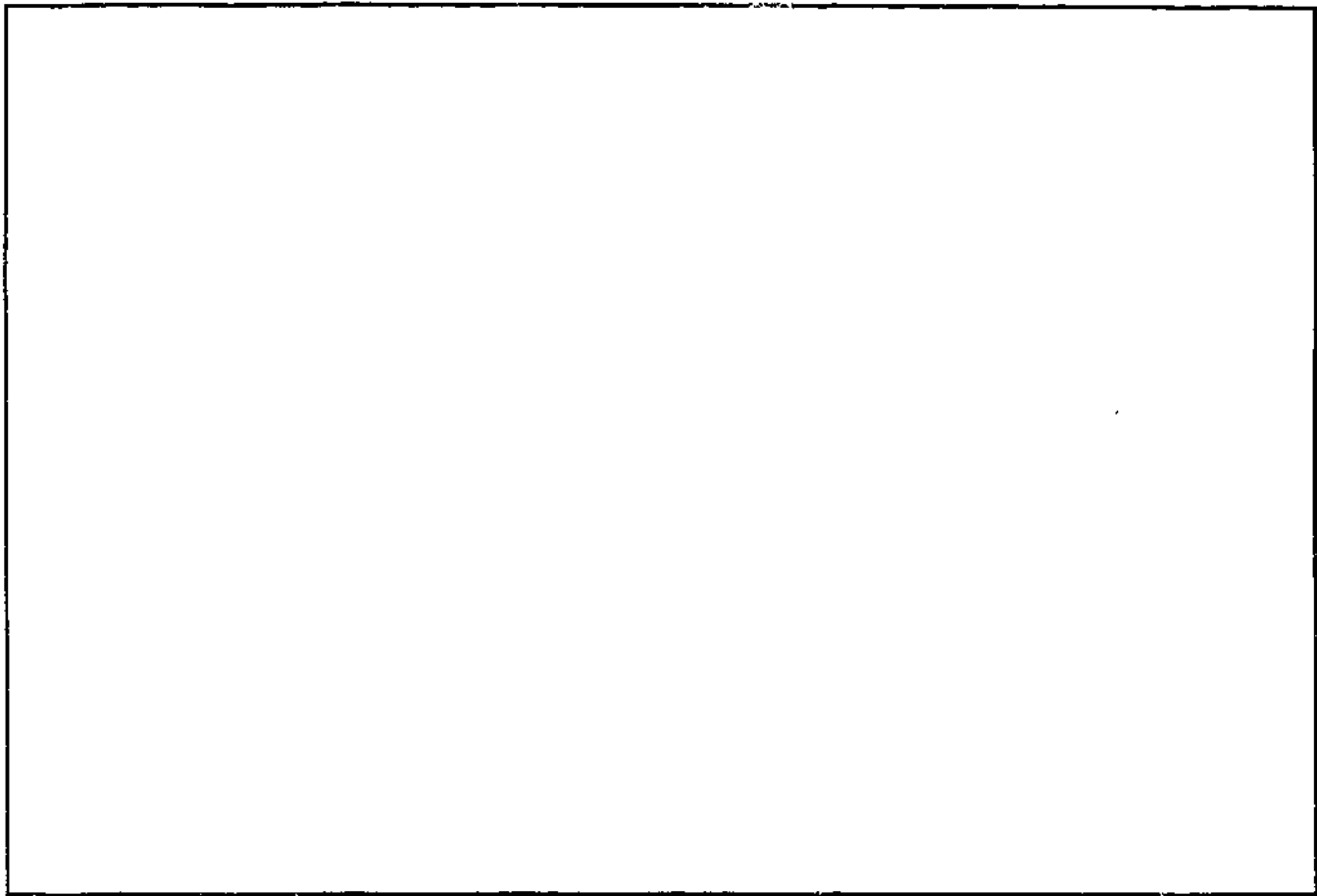
I KNOW THAT THIS HAS BEEN A LONG QUESTIONNAIRE. THANKS VERY MUCH FOR TAKING THE TIME TO COMPLETE IT. CAN YOU TAKE JUST A MINUTE OR SO TO CHECK THAT YOU HAVE ANSWERED ALL OF THE QUESTIONS WHICH ARE RELEVANT TO YOU.

ONCE AGAIN THANKS VERY MUCH.



The diagram illustrates a Repertory Grid Form. It consists of a grid with 10 columns and 10 rows. Above the grid, there are 8 diagonal lines sloping downwards from left to right. To the left of the grid, there is a horizontal line with 8 dots positioned above it, representing a scale or a set of points.


**Figure A6.1: Facsimile of Repertory Grid Form**



**Figure A6.2: Sample of Ellipse Used for Recording Elements**

## APPENDIX VII

### PUBLISHED PAPERS

This appendix contains two papers that were published during the course of the research for the thesis.

The first paper, *The Marriage of Personal Construct Psychology and Fuzzy Logic* (Anderson, 1996), outlines the theoretical basis of the Fuzzy-PCP model and presents the model itself.

The second paper, *A Model for Fuzzy Personal Construct Psychology* (Anderson, 1998), presents an application of the model to a case study. This paper also shows how the output FUZZYGRID was used to develop Multidimensional Scaling Models. Thus these papers span the principal theoretical and methodological contributions of this thesis which were presented in chapters 2, 3, 4 and 6. The future research direction proposed in the paper was to develop methods for examining 'temporal changes in perceptions' A detailed exposition of how this was achieved was presented in chapter 7.

## The Marriage of Personal Construct Psychology and Fuzzy Logic

Alastair Anderson  
Deakin University  
Faculty of Management  
School of Management Information Systems  
221 Burwood Highway  
Burwood, Victoria, 3125, Australia

### Introduction

George Kelly published *The Psychology of Personal Constructs* [1]. The work was anomalous. It presented a countervailing view of human behaviour, as directed by the personal constructs of individuals not by ego emotion, motivation, reinforcement, drive, the unconscious or need [1]. In particular, Kelly's work stood in stark contrast to the behaviourist paradigm which was the basis for much of the research and practice in psychology. It appeared to have no linkage with the early or contemporary literature in psychology. This is evidenced by the scant reference to the work of others when some may well have been expected; say, for example, to Osgood who at that time was working on the Semantic Differential which is a 'kissing cousin' of the Personal Construct derived by Kelly [2]. Together with the theory of Personal Construct Psychology (PCP) Kelly also derived a methodological approach known as the Repertory Grid technique. Elaborations of this technique, and its applications can be found in [4] [5] [6] [7] [8].

Whilst being critical of Kelly's lack of attribution it is nevertheless the case that, conceptually speaking, his work was ahead of its time. It has come to the forefront with the emergence of research concerning knowledge acquisition, and cognitive processes particularly as they relate to specialist human knowledge [9]. As a theory PCP should be understood as a basis for knowledge acquisition and the representation of cognitive structures across a range of areas including expert systems, intrapersonal and group processes and human resources management to name but a few. The application of the theory and its accompanying methodology is only limited by one's imagination.

There are two purposes to this paper. The first, and the one from which the name of the paper is derived, is to demonstrate that there is a natural bridge between PCP and Fuzzy Set Theory (FST). The conjunction of PCP and FST will be referred to as *Fuzzy Personal Construct Psychology (FPCP)*. The second purpose is to introduce a model based on the notion of FPCP. The model incorporates personal constructs as *fuzzy* subsets. It can be used to evaluate the *cognitive complexity-simplicity* of construct systems.

### Fuzzy Personal Construct Psychology

Zadeh conceptualized and introduced *fuzzy* sets and the theory which surrounds them [10]. Fuzzy set theory is elaborated in considerable detail in [11] [12]. In a *classical* set membership is binary. The valuation set is constrained to contain only the values 1 and 0 which denote membership and non-membership respectively. In contrast, a set is *fuzzy* when the valuation set is not constrained to be just 0 or 1 but can contain values in the interval 0 or 1. This relaxation caters for membership values which are *crisp* (0 or 1) as well as those which are *fuzzy* (between 0 and 1). Fuzziness is not the same as probabilistic assessments made by individuals. Probability concerns uncertainty, whereas fuzziness relates to classes where there may be grades of membership between full membership and nonmembership [12].

Constructs are a means of discrimination between observed items (usually called elements) in terms of similarity and contrast. Typically constructs are bipolar and comprise an *emergent pole* and a *contrast pole*. The logic is that one cannot identify similarity without difference or contrast. Constructs are usually elicited by presenting a participant with a triad of elements and asking her/him to identify those two elements that are similar in some way and different from the third. The participant is then asked to indicate the basis of the similarity. For example, a person may be presented with the names of three people with whom they work and asked to group the two people who are similar in some respect and different from the third.

This may result in the elicitation of a construct say *Authority/Subordinate*. This construct indicates how the participant views the triad in term of power relations. One might be tempted to think of a construct as always comprising semantic opposites such as *Good/Bad* or *Intelligent/Stupid*, but this need not be so [13]. What is important is that a person understands a construct as a dimension [2]. This gives expression to the notion of personal constructs as being meaningful and useful for the individual.

In his major work Kelly assumed that constructs were dichotomous, and that people locate elements on one or other of the construct poles in a Boolean fashion [1]. For example, on the construct *Good/Bad* one might construe ones boss as good. The assumption of dichotomy therefore forces one to locate elements on one or other of the construct poles, and not in any intermediate positions. There is no room for grayness. Kelly tried to repair the situation, as the following indicates : 'thus the construct refers to the nature of the distinction one attempts to make between events, not to the array in which his events appear to stand when he gets through applying the distinction between each of them and all the others' [2]. What one can take from this is that construct poles serve as a basis for discrimination between elements. Discriminations may be *crisp* (Boolean) but they need not be so. They can be *fuzzy* [12].

In summary, constructs serve as discriminations involving similarity and contrast. Elaborating constructs in terms of fuzzy set theory allows one to entertain discriminations other than those of dichotomy, and to overcome the limitations inherent in using interval level rating scales as the basis for representing and analyzing those discriminations [14].

#### Cognitive Complexity-Simplicity

Bieri defined a complex person as one who can construe others in a multidimensional way [3]. A simple cognitive structure is one in which there are large correlations between the constructs. In the extreme case one might refer to a person as exhibiting a *monolithic* structure, when one construct appears to be driving a total construct system. That is, the constructs are so highly correlated that what they represent is one underlying construct. A factor analysis of such a system might reveal one factor which accounts for 80% or more of the variation. Complex structures are indicated by a relatively large number of independent constructs. That is, one expects to find lower correlations amongst constructs in a complex system. Conceptually speaking Bieri's idea of complexity was a novel one, and a welcome addition to the literature. However, *cognitive complexity-simplicity* should not be assessed in isolation. The *context* to which constructs relate and the *content* of constructs should be evaluated in tandem with measures of cognitive complexity-simplicity. For example, when one interviews a doctor about her expertise the context is the professional milieu in which that person functions as a professional. One expects constructs connected with this context to be primarily *instrumental* in their content. In contrast if interviewing the same person about her interpersonal relationships at work one would expect to elicit at least some *expressive* constructs which are reflective of her as a person. This idea can be articulated to the Kelly's Range corollary which states that a construct (or a collection of constructs) is convenient for only a defined range of events [1]. People need to switch in and out of construct systems according to the context in which they find themselves. The FPCP model introduced below draws on the concept of cognitive-complexity-simplicity.

#### The Fuzzy PCP Model

The foregoing has prepared the way for modelling personal constructs as fuzzy subsets. The primary idea behind the model is that of *intraindividual consensus*. The idea was prompted after an analysis of the work in [15] [16] [17] [18] [19] [20] [21] [22]. The work in [22] is a summative paper. It employs fuzzy set theory as the basis for a measure of group consensus. The notion of group consensus which is *interindividual* can be applied to the task of assessing the structure of a construct system. If measures of group consensus can be constructed, then measures of grid consensus in terms of the constructs can be developed by applying similar logic. That is, by viewing constructs as members of a *synthetic group*. What is derived in this work then is a measure of *intraindividual consensus* in terms of the constructs. The measure is an indicant of the cognitive complexity-simplicity of a construct system.

## The Mathematics of the Fuzzy PCP Model

The basis of the model is a *Fuzzy Repertory Grid*:

Let  $E$  be a set of  $n$  elements:

$$E = \{e_1, e_2, \dots, e_n\} \quad (1)$$

$E$  is a classical set. By using triadic elicitation, or by a similar method, a Fuzzy Repertory Grid  $G$  is generated. In general,  $G$  is an  $m \times n$  matrix but is usually square. The columns of  $G$  are the elements of  $E$  and the rows are *Fuzzy Construct Subsets* of  $E$ .

A fuzzy construct subset  $C_i$  of  $E$  is a set of ordered pairs:

$$C_i = \{(e_j, \mu_{C_i}(e_j))\} \quad \forall e_j \in E, 0 < i \leq m, 0 < j \leq n, - \text{denotes a fuzzy construct subset.} \quad (2)$$

$\mu_{C_i}(e_j)$  is a membership characteristic function which takes its values in the totally ordered set  $M = [0, 1]$  and indicates the degree or level of membership. If  $M = \{0, 1\}$  then the fuzzy construct subset is understood to be a non-fuzzy construct subset or ordinary construct subset [10].

The procedures which have been developed to generate construct consensus measures are summarized below.

### Procedure 1

Transpose  $G$ .

### Procedure 2

Create  $m$  *Fuzzy Construct Matrices*  $F_k$ ,  $0 < k \leq m$ , where  $m$  is the number of columns in

$$g' = \{g'(i, k), 0 < i \leq n, 0 < k \leq m\} \quad (3)$$

Each  $F_k$  is an  $n \times n$  matrix with elements

$$f_k(i, j) = \begin{cases} g'(i, k), & \text{if } i = j \\ \min(g'(i, k), g'(j, k)), & \text{if } i \neq j \end{cases} \quad (4)$$

### Procedure 3

Using the Decomposition Theorem [10] create *Hard Alpha Level Matrices* such that:

$$H_{k, \alpha_l} = \{h_{k, \alpha_l}(i, j), 0 < k \leq n, 0 < \alpha_l \leq 1, 0 < l \leq q, 0 < i, j \leq n\}$$

$$h_{k, \alpha_l}(i, j) = \begin{cases} 0 & \text{if } f_k(i, j) < \alpha_l \\ 1 & \text{if } f_k(i, j) \geq \alpha_l \end{cases} \quad (5)$$

### Procedure 4

- (a) First, compare all of these hard matrices pairwise in order to determine the level of agreement between them. Accordingly, define the agreement measure  $A(H_{k, \alpha_l}, H_{k', \alpha_{l'}})$ , as follows:

$$A(H_{k, \alpha_l}, H_{k', \alpha_{l'}}) = \frac{n(H_{k, \alpha_l}, H_{k', \alpha_{l'}})}{n(H_{k, \alpha_l}, H_{k, \alpha_l}) + n(H_{k, \alpha_l}, H_{k', \alpha_{l'}}) - n(H_{k, \alpha_l}, H_{k', \alpha_{l'}})}, 0 < k, k' \leq n, k \neq k' \quad (6)$$

- (b) Second, display the results in an *Alpha Level Consensus Matrix*

$$C_{\alpha_i}(i,j) = \begin{cases} A(H_{k_{\alpha_i}}, H_{k'_{\alpha_i}}) & i = j \\ 0 & i \neq j \end{cases} \quad (7)$$

#### Procedure 5

Calculate an estimate of the  $\alpha_i$ -level Construct Consensus  $K_{\alpha_i}$ , using

$$K_{\alpha_i} = \frac{\sum (C_{\alpha_i}^2)}{n(n-1)}, 0 < \alpha \leq 1, 0 < i \leq q \quad (8)$$

Recall that  $n$  is the number of hard matrices under consideration.

#### Procedure 6

Repeat Procedures 3, 4, 5, and 6, until  $\alpha_i = 1$ .

#### Procedure 7

- (a) First, calculate a measure of *Overall Construct Consensus*,  $K$ , using

$$K = \sqrt{\frac{1}{2l}(K_{\alpha_0} + 2K_{\alpha_1} + 2K_{\alpha_2} + \dots + K_{\alpha_l})}, K_{\alpha_0} = 1 \quad (9)$$

$K$  can be interpreted as a global measure which indicates the cognitive complexity-simplicity of a construct system. The minimum and maximum values for  $K$  are 0 and 1 respectively. At its minimum  $K$  reflects a complex construct system with maximal differentiation between the constructs. At its maximum  $K$  is indicative of a simple construct system with no differentiation between the constructs.

- (b) Second, calculate a measure of the *Overall Pairwise Consensus of Constructs*,  $A(H_k, H_{k'})$ , using

$$A(H_k, H_{k'}) = \frac{1}{2l} \left( A(H_{k_{\alpha_0}}, H_{k'_{\alpha_0}}) + 2A(H_{k_{\alpha_1}}, H_{k'_{\alpha_1}}) + 2A(H_{k_{\alpha_2}}, H_{k'_{\alpha_2}}) + \dots + A(H_{k_{\alpha_l}}, H_{k'_{\alpha_l}}) \right), A(H_{k_{\alpha_0}}, H_{k'_{\alpha_0}}) = 1 \quad (10)$$

$A(H_k, H_{k'})$  can be interpreted as indicating the similarity of the constructs as pairs. When arranged as a matrix these values can be interpreted as representing a *similarity matrix*. The minimum and maximum values for  $A(H_k, H_{k'})$  are 0 and 1 respectively. When  $A(H_k, H_{k'})$  is 0 a construct pair is *dissimilar*. When  $A(H_k, H_{k'})$  is 1 a construct pair is *similar*.

#### Conclusions and Future Research Directions

The purposes of this paper were to establish a linkage between Personal Construct Psychology and Fuzzy Set Theory, and to demonstrate that by using this conjunction a model was developed which allows one to measure the cognitive complexity-simplicity of a construct system. The model is an attractive one because it incorporates fuzziness. This is more realistic in terms of capturing the way in which human beings give expression to their understanding of the world of knowledge, objects, people, relationships and situations. The measure of cognitive complexity-simplicity is also attractive since it is bounded on [0 1] as is the measure of the pairwise similarity of constructs.

The procedures which form the basis of the model have been incorporated in a computer program named FUZZYGRID. This program is undergoing further development. Three objectives have been established. The first, which will enhance the power of the program, is to use the similarity matrix generated by the program as a basis for generating a *dissimilarity matrix*. This matrix can then be used in conjunction with SPSS to perform *multidimensional scaling analysis* of a fuzzy repertory grid. This will be a significant enhancement since data diagnostics and graphical output will be achievable. The second is to enhance the user interface by incorporating the program within a Windows environment. The third is to investigate the potential of the model as an analytical tool for group processes including decision support systems.

## References

- [1] Kelly, G. A. (1955) *The Psychology of Personal Constructs*, Vols 1 & 2, Norton, New York.
- [2] Bannister, D. and Mair, J. M. (1968) *The Evaluation of Personal Constructs*, Academic Press, London.
- [3] Bieri, J. (1955) "Complexity-Simplicity and Predictive Behavior", *Journal of Abnormal Social Psychology*, 51, 263-268.
- [4] Fransella, F. and Bannister D. (1977) *A Manual For Repertory Grid Technique*, Academic Press, London.
- [5] Easterby-Smith, M. (1981) "The Design, Analysis, and Interpretation of Repertory Grids", in Shaw, M. L. G. (ed) *Recent Advances in Personal Construct Technology*, Academic Press, London.
- [6] Slater, P. (ed) (1977) *The Measurement of Intrapersonal Space by Grid Technique*, Vols 1 & 2, Wiley, London.
- [7] Stewart, V. and Stewart, A. (1981) *Business Applications of the Repertory Grid*, McGraw-Hill, London.
- [8] Huff, A. F. (ed) (1990) *Mapping Strategic Thought*, Wiley, Chichester.
- [9] Shaw, M. L. G. and Gaines, B. R. (1992) "Kelly's Geometry of Psychological Space and its Significance for Cognitive Modeling", *The New Psychologist*, October, 1-14.
- [10] Zadeh, L. A. (1965) "Fuzzy Sets", *Information and Control*, 8, 338-353.
- [11] Kaufmann, A. (1975) *Introduction to the Theory of Fuzzy Subsets*, Vol 1, Academic Press, New York.
- [12] Smithson, M. (1987) *Fuzzy Set Analysis for the Behavioral Sciences*, Springer Verlag, New York.
- [13] Bahm, A. J. (1970) *Polarity, Dialectic and Organicity*, Thomas, Illinois.
- [14] Hesketh, B., Pryor, R., Gleitzman, M. and Hesketh, T. (1988) "Practical Applications and Psychometric Evaluation Of a Computerized Fuzzy Graphic Rating" in *Fuzzy Sets in Psychology*, Zélenyi, T. (ed), North Holland Amsterdam.
- [15] Blin, J. M. and Whinston, A. B. (1974) "Fuzzy Sets and Social Choice", *Journal of Cybernetics*, 3, 28-36.
- [16] Blin, J. M. (1974) "Fuzzy Relations in Group Decision Theory", *Journal of Cybernetics*, 4, 17-22.
- [17] Bezdek, J. C., Spillman, B. and Spillman, R. (1977) "Fuzzy Measures of Preference and Consensus in Group Decision Making" *IEEE, Proceedings of Conference on Decision and Control*, 1303-1308.
- [18] Bezdek, J. C., Spillman, B. and Spillman, R. (1978) "A Fuzzy Relations Space For Group Decision Theory", *Fuzzy Sets and Systems*, 1, 255-268.
- [19] Spillman, B., Spillman, R. and Bezdek J. C. (1979) "Fuzzy Relations Spaces For Group Decision Theory: An Application", *Fuzzy Sets and Systems*, 2, 5-14.
- [20] Spillman, B., Spillman, R. and Bezdek, J. C. (1979) "Coalition Analysis With Fuzzy Sets", *Kybernetes*, 8, 203-211.
- [21] Spillman, B., Bezdek, J. C. and Spillman, R. (1979) "Development of an Instrument for the Dynamic Measure of Consensus", *Communication Monographs*, 46, 1-12.
- [22] Spillman, B., Spillman, R., and Bezdek, J. C. (1980) "A Fuzzy Analysis of Consensus in Small Groups", in *Fuzzy Sets Theory and Applications in Policy Analysis and Information Systems*, Wang, P. P. and Chang, S. K. (eds), Plenum Press, New York.

**Acknowledgment.** The author would like to thank Dr Roger Wallace for valuable comments on earlier drafts of this paper and Mr George Nowara for providing programming assistance in the development of FUZZYGRID.



# **A MODEL FOR FUZZY PERSONAL CONSTRUCT PSYCHOLOGY**

**Alastair Anderson**

Deakin University  
Faculty of Management  
School of Management Information Systems  
221 Burwood Highway  
Burwood, VIC 3125  
Australia

E-mail: [alpal@deakin.edu.au](mailto:alpal@deakin.edu.au)

**Abstract:** This paper examines the natural linkage between Personal Construct Psychology (Kelly, 1955) and Fuzzy Set Theory (Zadeh, 1965). Kelly conceptualised constructs as dichotomous abstractions upon which human beings construe others. In contemporary work constructs are accepted as dichotomous in form. However, they are not only seen as dichotomous in application. It is this feature of construing which engenders the linkage between Personal Construct Psychology and Fuzzy Set Theory. The paper presents a mathematical model that combines the essence of Personal Construct Psychology with Fuzzy Set Theory. The model can be used to generate structural measures for a construct system in terms of the complexity of that system. The model has been incorporated in a software program named FUZZYGRID. An overview of this program is presented as is a case study which demonstrates the application of the model. The way in which model results can be used in a multidimensional scaling analysis is also presented.

**Keywords:** Cognitive Complexity, Cognitive Schema, Consensus, Fuzzy Sets, Multidimensional Scaling, Personal Construct Psychology, Psychology, Repertory Grid, Work, Non-Work.

## **1. Introduction**

George Kelly's major work, *The Psychology of Personal Constructs* was anomalous. It presented a countervailing view of human behaviour, as directed by the personal constructs of individuals not by ego emotion, motivation, reinforcement, drive, the unconscious or need [1]. The work stood in stark contrast to the behaviourist paradigm which was the basis for much of the research and practice in psychology. It appeared to have no linkage with the early

or contemporary literature. This is evidenced by the scant reference to the work of others when considerable discussion was warranted. Bartlett's work on cognitive schema and the developmental work of Piaget rate no mention [2]. One is also surprised that Osgood achieved only a minor mention by Kelly since the Semantic Differential is a 'kissing cousin' of the Personal Construct [3]. In conjunction with the theory of Personal Construct Psychology (PCP), Kelly also formulated a methodological approach known as the *Repertory Grid* technique. Elaborations of this technique, and its applications can be found in [3] [4] [5] [6] [7] [8].

Notwithstanding Kelly's lack of attribution, conceptually speaking his work was ahead of its time. It has come to the forefront with the emergence of research concerning knowledge acquisition, and cognitive processes particularly as they relate to specialist human knowledge [9]. PCP and the grid technique provide a framework for knowledge acquisition and the representation and analysis of cognitive schema across a range of areas including expert systems, intrapersonal and group processes and human resources management to name but a few. The application of the theory and its accompanying methodology is limited only by one's imagination.

This paper comprises four sections. Section 2 establishes the natural bridge between PCP and Fuzzy Set Theory (FST). The conjunction of PCP and FST will be referred to as Fuzzy Personal Construct Psychology (FPCP)<sup>i</sup>

In Section 3, the mathematics of a model in which constructs are treated as fuzzy subsets is presented. FUZZYGRID, a program which embodies the model is introduced.

Section 4 presents results from the application of the model to a single case. The way in which the model results can be used in a multidimensional scaling analysis is also demonstrated. This enhances the model as data diagnostics and graphical output are available.

Section 5 draws some conclusions from the work to date and discusses future research directions.

## 2. Fuzzy Personal Construct Psychology

Zadeh conceptualized *fuzzy sets* and developed the theory which surrounds them [10]. Fuzzy set theory is elaborated in considerable detail in [11] [12]. In a classical set membership is binary. The valuation set is constrained to contain only the values 0 and 1 which denote non-membership and membership respectively. In contrast, a set is fuzzy when the valuation set is not constrained to be just 0 and 1 but can contain values in the interval 0 to 1. This relaxation caters for membership values which are crisp (0 or 1) as well as those which are fuzzy (between 0 and 1). Fuzziness is not the same as probabilistic assessments made by individuals. Probability concerns uncertainty, whereas fuzziness relates

classes where there may be grades of membership between full membership and nonmembership [12].

## 2.1. Personal Constructs

*Personal Constructs* are a means of discrimination between items (usually called elements) in terms of similarity and contrast. They are bipolar in form and comprise an emergent and a contrast pole. The logic is that one cannot identify similarity without difference or contrast. Constructs are usually elicited by presenting a participant with a triad of elements and asking her/him to identify those two which are similar in some way and different from the third. The participant is then asked to indicate the basis of the similarity. For example, a person may be presented with the names of three people with whom they work and asked to group the two people who are similar in some respect and different from the third. This may result in the elicitation of a construct say *Authority/Subordinate*. This construct indicates how the participant views the triad in term of power relations. One might be tempted to think of a construct as always comprising semantic opposites such as *Good/Bad* or *Intelligent/Stupid*, but this need not be so [13]. What is important is that a person understands a construct as a dimension [3]. This gives expression to the notion of personal constructs as meaningful and useful to the individual.

In his major work Kelly assumed that constructs were dichotomous, in form and in application [1]. The assumption of dichotomy forced one to locate elements on one or other of the construct poles, not in any intermediate positions. There was no room for grayness. Kelly tried to repair the situation, as the following indicates : 'thus the construct refers to the nature of the distinction one attempts to make between events, not to the array in which his events appear to stand when he gets through applying the distinction between each of them and all the others' [3]. What one can take from this is that construct poles serve as a basis for discrimination between elements. Discriminations may be crisp (Boolean) but they need not be so. They can be fuzzy [12].

In summary, constructs serve as a basis for discriminations involving similarity and contrast. Elaborating constructs in terms of fuzzy set theory, allows one to entertain discriminations other than those of dichotomy, and to overcome the limitations inherent in using interval level rating scales as the means for representing and analyzing those discriminations [14].

## 2.2. Cognitive Complexity

Bieri defined a complex person as one who can construe others in a multidimensional way [15]. A simple cognitive structure is one in which there are large correlations between the constructs. In the extreme case, one might refer to a person as exhibiting a monolithic structure, when the constructs are highly correlated. A factor analysis of such a system might uncover one factor which

accounts for 80% or more of the variation. Complex structures are indicated by a relatively large number of independent constructs. That is, one expects to find lower correlations amongst constructs in a complex system.

Conceptually speaking Bieri's idea of complexity was a novel one, and a welcome addition to the literature. However, cognitive complexity should not be viewed in isolation. The context to which constructs relate and the content of constructs should be evaluated in tandem with measures of cognitive complexity. For example, when one interviews a doctor about her expertise one expects constructs connected with the context to be primarily instrumental in their content. One would not be surprised to observe a complex system indicative of the subtle discriminations which are the hallmark of experts. In contrast, if interviewing the same person about her interpersonal relationships, one expects to elicit expressive constructs, which are reflective of her as a person and which exhibit a greater degree of interdependence. This idea is consistent with Kelly's Range corollary which states that a construct (or a collection of constructs) is convenient for only a defined range of events [1]. People need to switch in and out of construct systems according to the context in which they find themselves. The FPCP model draws on the concept of cognitive complexity.

### 3. The Fuzzy PCP Model

The foregoing has prepared the way for modelling personal constructs as fuzzy subsets and for deriving structural measures for construct systems. A primary idea behind the model is that of intraindividual consensus. The idea was prompted after an analysis of the work in [16] [17] [18] [19] [20] [21] [22] and [23]. The work in [23] is a summative paper. It employs fuzzy set theory as the basis for a measure of group consensus. The notion of group consensus which is interindividual can be applied to the task of assessing the structure of a construct system. If measures of group consensus can be constructed, then measures of grid consensus in terms of the constructs can be developed by applying similar logic. That is, by viewing constructs as members of a synthetic group. What is derived in this work then is a measure of intraindividual consensus in terms of the constructs. The measure can be used as an indicant of the cognitive complexity of a construct system.

#### 3.1. The Mathematics of the Model

The basis of the model is a *Fuzzy Repertory Grid*.

Let  $E$  be a set of  $n$  elements:

$$E = \{e_1, e_2, \dots, e_n\} \quad (1)$$

where  $E$  is a classical set. By using triadic elicitation, or by a similar method, a Fuzzy Repertory Grid  $\underline{G}$  is generated. In general,  $\underline{G}$  is an  $m \times n$  matrix but is usually square. (The  $\sim$  denotes matrices and vectors which are fuzzy).

The columns of  $\underline{G}$  are the elements of  $E$  and the rows are *Fuzzy Construct Subsets* of  $E$ .

A fuzzy construct subset  $\underline{C}_i$  of  $E$  is a set of ordered pairs:

$$\underline{C}_i = \left\{ \left( e_j, \mu_{\underline{C}_i}(e_j) \right) \right\}, \forall e_j \in E, \quad 0 < i \leq m, \quad 0 < j \leq n \quad (2)$$

where  $\mu_{\underline{C}_i}(e_j)$  is a membership characteristic function which takes its values in the totally ordered set  $M = [0, 1]$  and indicates the degree or level of membership. If  $M = \{0, 1\}$  then the fuzzy construct subset is understood to be a non-fuzzy construct subset or ordinary construct subset [11]<sup>ii</sup>

The procedures which have been developed, to generate a measure of construct consensus, and similarity measures for construct pairs are summarized below:

#### Procedure 1

Transpose  $\underline{G}$

#### Procedure 2

Create  $m$  Fuzzy Construct Matrices  $\underline{F}_k$ ,  $0 < k \leq m$ , where  $m$  is the number of columns in

$$\underline{G}' = \{g'(i, k), \quad 0 < i \leq n, \quad 0 < k \leq m\} \quad (3)$$

Each  $\underline{F}_k$  is an  $n \times n$  matrix with elements

$$f_k(i, j) = \begin{cases} g'(i, k), & \text{if } i = j \\ \min(g'(i, k), g'(j, k)), & \text{if } i \neq j \end{cases} \quad (4)$$

### Procedure 3

Using the Decomposition Theorem [11] create *Hard Alpha Level Matrices* such that:

$$H_{k\alpha_l} = \{h_{k\alpha_l}(i,j), 0 < k \leq m, 0 < \alpha \leq 1, 0 < l \leq q, 0 < i,j \leq n\}$$

where

$$h_{k\alpha_l} = \begin{cases} 0 & \text{if } f_k(i,j) < \alpha_l \\ 1 & \text{if } f_k(i,j) \geq \alpha_l \end{cases} \quad (5)$$

### Procedure 4

- (a) First, compare all of these hard matrices pairwise in order to determine the level of agreement between them. Accordingly and following [23] define the agreement measure  $A(H_{k\alpha_l}, H_{r\alpha_l})$ , as:

$$A(H_{k\alpha_l}, H_{r\alpha_l}) = \frac{\text{tr}(H_{k\alpha_l} H_{r\alpha_l}^t)}{\text{tr}(H_{k\alpha_l} H_{k\alpha_l}^t) + \text{tr}(H_{r\alpha_l} H_{r\alpha_l}^t) - \text{tr}(H_{k\alpha_l} H_{r\alpha_l}^t)}, \quad 0 < k, r \leq m, k \neq r \quad (6)$$

where  $\text{tr}(\cdot)$  and  $(\cdot)^t$  denote the trace and the transpose operations respectively

- (b) Second, display the results in an *Alpha Level Consensus Matrix* [23]

$$(C_{\alpha_l})_{ij} = \begin{cases} A(H_{k\alpha_l}, H_{r\alpha_l}) & i \neq j \\ 0 & i = j \end{cases} \quad (7)$$

### Procedure 5

Calculate an estimate of the  $\alpha$  - level *Construct Consensus*,  $K_{\alpha}$ , using

$$K_{\alpha_l} = \frac{\text{tr}(C_{\alpha_l}^2)}{m(m-1)}, \quad 0 < \alpha \leq 1, 0 < l \leq q \quad (8)^{iii}$$

Recall that  $m$  is the number of hard matrices under consideration.

### Procedure 6

Repeat Procedures 3, 4, 5, until  $\alpha_i = 1$ .

### Procedure 7

(a) First, calculate a measure of *Overall Construct Consensus*,  $K$  using

$$K = \sqrt{\frac{1}{2I} (K_{\alpha_0} + 2K_{\alpha_1} + 2K_{\alpha_2} + \dots + K_{\alpha_i})}, \quad K_{\alpha_0} = 1 \quad (9)^{iv}$$

where  $K$  can be interpreted as a global measure which indicates the cognitive complexity of a construct system. The minimum and maximum values for  $K$  are 0 and 1 respectively. At its minimum  $K$  indicates a complex construct system with maximal differentiation between the constructs. At its maximum  $K$  is indicative of a simple construct system with no differentiation between the constructs.

(b) Second, calculate a measure of the *Overall Pairwise Consensus* of Constructs,  $A(H_k, H_{k'})$ , using

$$A(H_k, H_{k'}) = \frac{1}{2I} \left( \begin{aligned} &A(H_{k_{\alpha_0}}, H_{k'_{\alpha_0}}) + 2A(H_{k_{\alpha_1}}, H_{k'_{\alpha_1}}) + 2A(H_{k_{\alpha_2}}, H_{k'_{\alpha_2}}) + \dots \\ &+ A(H_{k_{\alpha_i}}, H_{k'_{\alpha_i}}) \end{aligned} \right),$$
$$A(H_{k_{\alpha_0}}, H_{k'_{\alpha_0}}) = 1 \quad (10)$$

where  $A(H_k, H_{k'})$  can be interpreted as indicating the similarity of the constructs as pairs. When arranged as a matrix these values can be interpreted as a similarity matrix. The minimum and maximum values for  $A(H_k, H_{k'})$  are 0 and 1 respectively. When  $A(H_k, H_{k'})$  is 0 a construct pair is dissimilar. When  $A(H_k, H_{k'})$  is 1 a construct pair is similar.

### 3.2. An Overview of FUZZYGRID

The model procedures have been incorporated in a software program named FUZZYGRID. This was necessary since the number of matrix multiplications required, excluding those which relate to the Consensus Matrices  $(C_{\alpha_i})^v$ , is

$\frac{m!}{x!(m-x)!} \times q$ , where  $m$  is the number of rows in  $G$ ,  $x=2$  and  $q$  is the number of *alpha cuts*. For example, if  $G$  has 8 rows and  $q = 10$ , then the number of matrix multiplications required is 280. FUZZYGRID allows these calculations to be done quickly and accurately.

As output FUZZYGRID provides  $K_a$  values, a measure of construct consensus  $K$  and two matrices, a similarity matrix for the construct pairs  $A(H_k, H_{k'})$  and a dissimilarity matrix for the construct pairs  $A(H_k, H_{k'})$ . The dissimilarity matrix can be ported to SPSS as input for a multidimensional scaling analysis of the constructs.

Though not shown in this paper the program also produces a consensus measure for the elements, and similarity and dissimilarity matrices for the element pairs.

#### 4. An Application of the Fuzzy PCP Model

This section introduces a case study as an illustration of how the Fuzzy PCP model can be employed to derive measures of cognitive structure. The emphasis is on the relationship between the constructs. However, it will be shown that it is also instructive to examine the relationship between the elements. Output from FUZZYGRID will be used as a basis for discussion and a classification exercise using multidimensional scaling techniques.

##### 4.1. The Context for the Case Study

The repertory grid reproduced in this paper forms part of a single case from a pilot study. The study addressed the way in which men construe their work and non-work domains. Each participant completed three repertory grids, one relating to work and non-work activities, one relating to significant others at work and one relating to significant others in the non-work world. The term participant is used quite deliberately here, to distinguish this kind of study from more traditional work where the term subject is usually employed. It reflects the idiographic philosophy which underpins PCP. The interest is in finding out how the participant construes the domain of interest, not in imposing a predetermined frame of reference to which the participant is asked to respond. The role of the interviewer is to encourage the participant to articulate their own frame of reference, to be unobtrusive.

David the participant in the case reported here is 37 years old. He has an honours degree in linguistics. At the time of interview, he had just returned to the workforce after completing further studies to qualify as a computer programmer. His partner is 38 years of age and has a doctoral qualification. She is a university lecturer. David's response to the question Who am I? was : a pilgrim, a searcher



for meaning, a movement between two infinities, a need, a love. This background helps to illuminate the material which follows. The grid shown is that which was elicited from David about his work and non-work activities.

#### 4.2. Grid Elicitation and Representation

Grids were elicited by the method of triads also known as the minimum context card form [1] [3]. Following [25] [26] and [27] participants were asked to write down pairs of activities, one work and one non-work as follows: two activities which they liked, two activities which they disliked, two activities which were important to them and two activities which they engaged in frequently. Each activity was written on a separate yellow card shaped in the form of an ellipse. The interviewer also wrote down the elements on a form which had been designed for recording the elements, the constructs and the ratings. The cards were used because they helped participants to focus their thoughts. Their shape made them easy to move around and fun to play with. They assisted in developing rapport between the interviewer and the participant.

Triads of elements were selected from a schedule which had been constructed to ensure that they were random in nature. For each triad participants were asked to indicate which two elements were alike and in what way. The response was written down in the leftmost column of the form. This word or phrase formed the emergent pole of the construct. The contrast pole was elicited by asking the participant to indicate in what way the third element was different from the other two. The response was written down in the rightmost column of the form. This process was repeated until eight constructs had been elicited.

Following this participants were asked to rate each element against each construct on a scale of [0, 10]. They were instructed to use a rating of 0 if they felt that the emergent pole of a construct described an element very well. If they felt that the contrast pole was seen as describing an element very well then a rating of 10 was to be awarded to that element. Intermediate unit ratings were also permitted to accommodate non-categorical evaluations. The participants were asked to indicate any constructs which did not make sense to them as a dimension in respect of one or more of the elements.

Following each elicitation session the data for each grid was rescaled on [0, 1] and reverse coded. The data was rescaled because earlier work revealed that participants had difficulty in using decimals to rate elements. Furthermore, participants appeared confused when asked to rate elements on the emergent pole (left pole) as 10 and the contrast pole (right pole) as 0. Consequently, it was decided to use 0 to anchor the emergent pole, 10 to anchor the contrast pole and to subsequently rescale and reverse code the ratings so as to reflect membership values for the fuzzy construct subsets described by the emergent pole. Whilst reverse coding is a fuzzy negation [12] the constructs themselves are meaningful only when viewed in terms of both poles. Kelly said that "both similarity and the contrast are inherent in the same construct" [1], there is a "tie of opposition

uniting the duality of meanings in a construct" [26]. Therefore, one is always mindful of the contrast pole even though mathematical analysis is conducted with respect to the emergent pole of a construct.

In the finalised grids scores of 1 indicate elements which are full members of the fuzzy construct subsets described by the emergent pole. Scores of 0 indicate elements which are non-members of the fuzzy construct subset described by the emergent pole. Values between 0 and 1 indicate differing degrees of membership.

The grid which describes David's work and non-work activities and the related constructs is shown below.

**Table 1 David's Work and Non-Work Activities and Constructs**

	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>	E <sub>5</sub>	E <sub>6</sub>	E <sub>7</sub>	E <sub>8</sub>	
C <sub>1</sub> : Pleasant	1.0	1.0	0.1	0.1	1.0	0.9	0.2	0.9	Unpleasant
C <sub>2</sub> : Meaningful	0.9	0.9	0.1	0.1	0.9	0.8	0.2	0.9	Meaningless for me
C <sub>3</sub> : What is new	0.9	1.0	0.2	0.2	0.9	0.8	0.4	0.9	Boring
C <sub>4</sub> : Quality	0.9	0.9	0.1	0.1	0.9	0.8	0.2	0.9	Poor quality
C <sub>5</sub> : Haphazard	0.1	0.9	0.5	0.1	0.9	0.8	0.8	0.2	Structured
C <sub>6</sub> : Weak side	0.2	0.2	0.9	0.9	0.2	0.3	0.5	0.1	Long suit
C <sub>7</sub> : Enjoyable	1.0	0.9	0.1	0.1	0.9	0.8	0.2	0.9	Not enjoyable
C <sub>8</sub> : Introverted	0.9	0.9	0.1	0.1	0.9	0.6	0.2	0.9	Extroverted

Note : The emergent poles of the constructs which are the names for the fuzzy constructs subsets are shown in the leftmost column.

The elements are:

E <sub>1</sub> : (a work activity I like)	Problem solving
E <sub>2</sub> : (a non-work activity I like)	Discovering things
E <sub>3</sub> : (a work activity I dislike)	Meetings
E <sub>4</sub> : (a non-work activity I dislike)	Shopping
E <sub>5</sub> : (a work activity which is important to me)	Creativity
E <sub>6</sub> : (a non-work activity which is important to me)	Good conversations
E <sub>7</sub> : (a work activity which I engage in frequently)	Computer Browsing
E <sub>8</sub> : (a non-work activity which I engage in frequently)	Reading

In some respects the elements in David's grid are as informative as the constructs. The predominant theme which shows through is his liking for things which are cerebral and his dislike for the mundane and run of the mill. His preferred milieu is the intellectual.

### 4.3. Extracting Structural Measures

Repertory grids should be analysed in terms of both structure and content. Structural measures refer primarily to the relationship between constructs. Content analysis focuses on the meaning of the grid. A comprehensive method for assessing the content of repertory grids can be found in [28]. By using the Fuzzy PCP model an overall indication of the structural properties of a construct system can be developed. The main results for David's grid are shown below.

Table 2 Construct Consensus Values for David's Grid

Alpha Values $\alpha_i$	Construct Consensus $K_{\alpha_i}$
0.00	1.00
0.10	1.00
0.20	0.53
0.30	0.46
0.40	0.46
0.50	0.55
0.60	0.55
0.70	0.45
0.80	0.45
0.90	0.44
1.00	0.00

Table 2 shows that when  $\alpha_i$  is between 0.10 and 0.40 inclusive the consensus between the constructs  $K_{\alpha_i}$ , decreases monotonically. Between 0.50 and 0.60 there is an inflection and the construct consensus values increase. Between the values of 0.70 and 1.00 the construct consensus values decrease monotonically. This pattern is not unexpected. The measure of agreement between pairs of constructs is based on an extension of the Tanimoto Coefficient for binary valued data vectors to binary valued matrices [23]. That is, one is interested in counting up the number of ones which occupy the same position in each of two *Hard Alpha Level Matrices*. Whilst it is usual for the number of unit entries to be decreasing as  $\alpha_i$  increases, there can be more of these unit entries in common between two hard matrices. This will cause the measure of agreement to increase. Therefore, since the agreement coefficients  $A(H_{i,\alpha_i}, H_{j,\alpha_i})$  form the elements of  $C_{\alpha_i}$ ,  $K_{\alpha_i}$  can in fact increase as  $\alpha_i$  increases. However, in general, the expected pattern is for  $K_{\alpha_i}$  to decline as  $\alpha_i$  increases. The *Overall Construct Consensus*

value  $K$ , for David's grid is 0.73. This value indicates that in relation to his work and non-work activities David employs a *tight* construct system. There is not much differentiation between the constructs. This is indicated by examining the pattern of agreement between the constructs in the similarity matrix shown in Table 3 below.

**Table 3 The Similarity of Construct Pairs in David's Grid**

0.00	0.94	0.85	0.94	0.47	0.41	0.94	0.88
0.94	0.00	0.88	0.97	0.47	0.41	0.97	0.91
0.85	0.88	0.00	0.88	0.49	0.46	0.88	0.81
0.94	0.97	0.88	0.00	0.47	0.41	0.97	0.91
0.47	0.47	0.49	0.47	0.00	0.42	0.47	0.46
0.41	0.41	0.46	0.41	0.42	0.00	0.41	0.41
0.94	0.97	0.88	0.97	0.47	0.41	0.00	0.91
0.88	0.91	0.81	0.91	0.46	0.41	0.91	0.00

**Note:** Zero entries are used on the main diagonal since the relationship of a construct with itself is redundant.

The matrix appears to indicate one cluster of constructs which involves constructs 1, 2, 3, 4, 7 and 8. Constructs 5 and 6 appear to stand alone. The similarity matrix can be used to generate a dissimilarity matrix for the construct pairs. This is done by subtracting the coefficients for each of the elements in the similarity matrix from 1.00. The resulting matrix of dissimilarities is shown as Table 4 below.

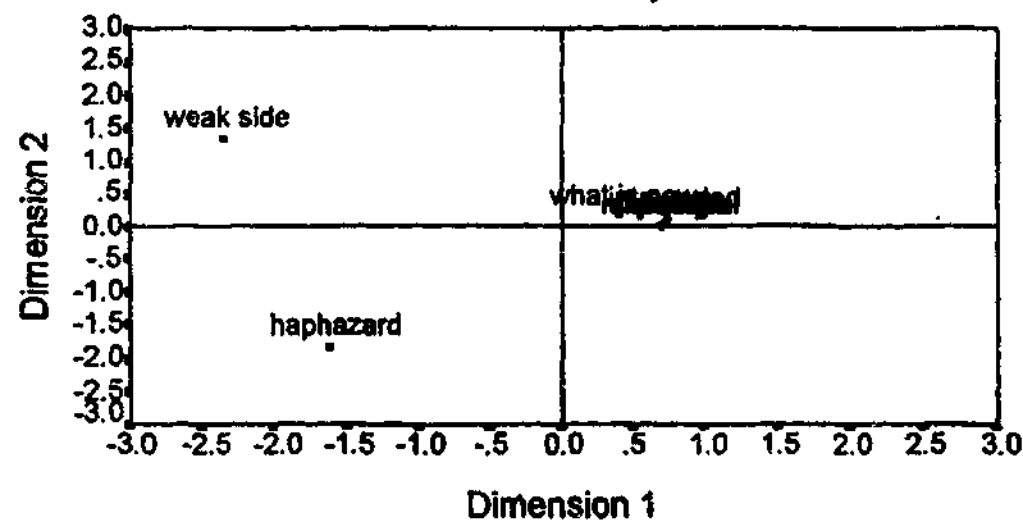
**Table 4 The Dissimilarity of Construct Pairs in David's Grid**

0.00	0.06	0.15	0.06	0.53	0.59	0.06	0.12
0.06	0.00	0.12	0.03	0.53	0.59	0.03	0.09
0.15	0.12	0.00	0.12	0.51	0.54	0.12	0.19
0.06	0.03	0.12	0.00	0.53	0.59	0.03	0.09
0.53	0.53	0.51	0.53	0.00	0.58	0.53	0.54
0.59	0.59	0.54	0.59	0.58	0.00	0.59	0.59
0.06	0.03	0.12	0.03	0.53	0.59	0.00	0.09
0.12	0.09	0.19	0.09	0.54	0.59	0.09	0.00

The values in this matrix form the basis of a multidimensional scaling analysis the results of which are outlined below. For a metric analysis in two dimensions the *S-Stress*, *Stress* and *RSQ* coefficients are 0.03, 0.10 and 0.99 respectively. Stress coefficients are a measure of error or lack of fit, high values are undesirable. The *RSQ* coefficient is interpreted in much the same way as the Coefficient of Determination. [29] It is the best indicator of how well the data fit the model [30]. Based on these statistics the two dimensional solution is excellent.

A graphical representation derived from the multidimensional scaling analysis is shown as Figure 1 below.

Figure 1. A Plot of David's Work Non-Work Constructs



What appears to be a typographical error is a tight construct cluster. The constructs in the cluster are 1, 2, 3, 4, 7, and 8.

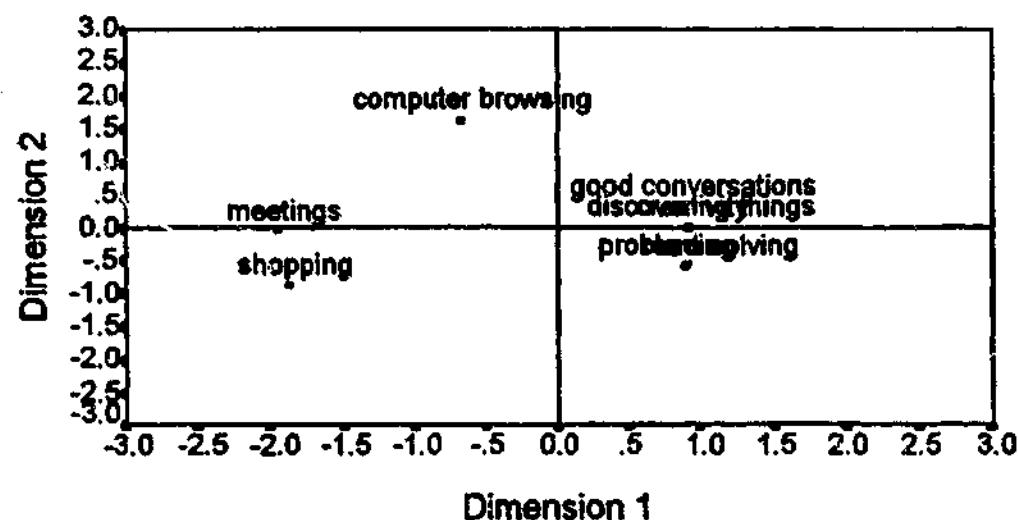
The pattern of constructs in a system can be described in terms of *internal cohesion* and *external isolation* [31]. What is represented here, is a simple construct system in which there is one primary cluster which is cohesive. It stands in isolation from two other constructs which are themselves isolated from one another. The six constructs in the primary cluster 1, 2, 3, 4, 7, and 8 appear to indicate one *superordinate construct* [1]. An umbrella term which describes the emergent pole of this superordinate construct might be *I like*. One notices that in the original grid Meetings and Shopping attract relatively high scores as *Structured* activities (the opposite of *Haphazard* for David) which David aligns with his *Weak side*. They are activities which he dislikes intensely. It would

appear that it is the mundane nature of these activities which affects David in a negative way. In contrast activities such as problem solving and reading are construed as bringing out the best in him, they are his *Long suit*. Whilst they are structured they are also intellectual. They appeal to his introverted nature.

#### 4.4. Exploiting the Duality of the Repertory Grid

What has been presented thus far is an analysis of the constructs. Classification studies usually comprise a set of  $n$  objects, each object being described by several variables. Occasionally these 'objects' could possibly be more conveniently described as 'variables' [51]. One can think of a repertory grid as comprising objects (the elements) and variables (the constructs) between which there is a duality. This duality can be exploited, by using the Fuzzy PCP model to generate consensus measures for the elements and the element pairs. This is achieved by omitting Procedure 1 and implementing the other procedures with regard to the elements and not the constructs. As mentioned earlier this process has been incorporated in FUZZYGRID and measures are available for both elements and constructs. The *S-Stress*, *Stress* and *RSQ* coefficients, from the multidimensional scaling analysis of the elements in David's grid are 0.10, 0.12 and 0.98 respectively. A two dimensional plot of the elements is shown as Figure 2 below.

Figure 2. A Plot of David's Work Non-Work Activities



What appears to be a typographical error is a tight element cluster. The elements in the cluster are 1, 2, 5, 6 and 8.

The plot reinforces what was discovered through the analysis of the constructs. One observes one primary cluster of cohesive elements. They are reflective of the David's intellectual orientation, at work and outside the work environment. *Discovering Things* and *Creativity* appear to be synonymous with one another as do *Problem Solving* and *Reading*. *Good Conversations* are intimately connected with these activities. *Meetings* and *Shopping* stand together as those activities which are disliked. A somewhat related dislike although to a lesser extent is *Browsing on the Computer*.

In summary, the analysis of David's construct system by way of the Fuzzy PCP model articulated with multidimensional scaling methods appears to be very successful. It renders a picture of David which is consistent with the interviewers perceptions. It is supported by many other indicators which were provided by way of a questionnaire and the other grids.

## 5. Conclusions and Future Research Directions

The primary purposes of this paper were to establish a linkage between Personal Construct Psychology and Fuzzy Set Theory; and to demonstrate that by using this conjunction a model was developed which allows one to assess the structure of a construct system. The model is an attractive one because it incorporates fuzziness. This is more realistic in terms of capturing the way in which human beings construe objects, activities, people, relationships and situations.

The measure of cognitive complexity is also attractive since it is bounded on  $[0, 1]$  as is the measure of the pairwise similarity of constructs. The duality in a repertory grid has been exploited. A consensus measure for the elements and similarity measures for element pairs can be derived.

It would appear that the model can be applied to the analysis of data emanating from Focus Groups and Group decision making environments. In these contexts the construct dimensions might be product attributes or decision criteria. The elements would represent individual members of a group. It should be possible to identify coalitions in groups as well as isolates. In marketing research applications one might be able to identify consumer types and to target key product attributes.

Further research is being undertaken to allow Weighted Multidimensional Scaling Methods to be employed in conjunction with model results. This would permit one to plot coalitions and isolates in a weight space and to examine temporal changes in perceptions.

George Kelly has been criticised for his lack of academic etiquette [32]. Nevertheless, when viewed in concert with the subsequent development of Fuzzy Set Theory and contemporary work in knowledge engineering, his work should be judged as remarkable and creative.

## References

- [1] Kelly, G. A. (1955) *The Psychology of Personal Constructs*, Vols 1 & 2, Norton, New York.
- [2] Mancuso, J. C. and Adams-Weber, J. R. (1982) *The Construing Person*, Praeger, New York.
- [3] Bannister, D. and Mair, J. M. (1968) *The Evaluation of Personal Constructs*, Academic Press, London.
- [4] Fransella, F. and Bannister D. (1977) *A Manual For Repertory Grid Technique*, Academic Press, London.
- [5] Easterby-Smith, M. (1981) "The Design, Analysis, and Interpretation of Repertory Grids", in Shaw, M. L. G. (ed), *Recent Advances in Personal Construct Technology*, Academic Press, London.
- [6] Slater, P. (ed) (1977) *The Measurement of Intrapersonal Space by Grid Technique*, Vols 1 & 2, Wiley, London.
- [7] Stewart, V. and Stewart, A. (1981) *Business Applications of the Repertory Grid*, McGraw-Hill, London.
- [8] Huff, A. F. (ed) (1990) *Mapping Strategic Thought*, Wiley, Chichester.
- [9] Shaw, M. L. G. and Gaines, B. R. (1992) "Kelly's Geometry of Psychological Space and its Significance for Cognitive Modeling", *The New Psychologist*, October, 1-14.
- [10] Zadeh, L. A. (1965) "Fuzzy Sets", *Information and Control*, 8, 338-353.
- [11] Kaufmann, A. (1975) *Introduction to the Theory of Fuzzy Subsets*, Vol 1, Academic Press, New York.
- [12] Smithson, M. (1987) *Fuzzy Set Analysis for the Behavioral Sciences*, Springer Verlag, New York.
- [13] Bahm, A. J. (1970) *Polarity, Dialectic and Organicity*, Thomas, Illinois.
- [14] Hesketh, B., Pryor, R., Gleitzman, M. and Hesketh, T. (1988) "Practical Applications and Psychometric Evaluation Of a Computerized Fuzzy Graphic Rating" in Zédenyi, T. (ed), *Fuzzy Sets in Psychology*, North Holland Amsterdam.
- [15] Bieri, J. (1955) "Complexity-Simplicity and Predictive Behavior", *Journal of Abnormal Social Psychology*, 51, 263-268.
- [16] Blin, J. M. and Whinston, A. B. (1974) "Fuzzy Sets and Social Choice", *Journal of Cybernetics*, 3, 28-36.
- [17] Blin, J. M. (1974) "Fuzzy Relations in Group Decision Theory", *Journal of Cybernetics*, 4, 17-22.
- [18] Bezdek, J. C., Spillman, B. and Spillman, R. (1977) "Fuzzy Measures of Preference and Consensus in Group Decision Making" *IEEE, Proceedings of Conference on Decision and Control*, 1303-1308.
- [19] Bezdek, J. C., Spillman, B. and Spillman, R. (1978) "A Fuzzy Relations Space For Group Decision Theory", *Fuzzy Sets and Systems*, 1, 255-268.



- [20] Spillman, B., Spillman, R. and Bezdek J. C. (1979) "Fuzzy Relations Spaces For Group Decision Theory: An Application", *Fuzzy Sets and Systems*, 2, 5-14.
- [21] Spillman, B., Spillman, R. and Bezdek, J. C. (1979) "Coalition Analysis With Fuzzy Sets", *Kybernetes*, 8, 203-211.
- [22] Spillman, B., Bezdek, J. C. and Spillman, R. (1979) "Development of an Instrument for the Dynamic Measure of Consensus", *Communication Monographs*, 46, 1-12.
- [23] Spillman, B., Spillman, R., and Bezdek, J. C. (1980) "A Fuzzy Analysis of Consensus in Small Groups", in Wang, P. P. and Chang, S. K. (eds), *Fuzzy Sets Theory and Applications in Policy Analysis and Information Systems*, Plenum Press, New York.
- [24] Zadeh, L. A. (1971) "Quantitative Fuzzy Semantics", *Information Sciences*, 3, 159-176.
- [25] Brook, J. A. and Brook, R. J. (1989) "Exploring the Meaning of Work and Nonwork", *Journal of Organisational Behaviour*, Vol, 10, 169-178.
- [26] Knowles, M. C. and Taylor, D. (1990) "Conceptualizations of Work, Family and Leisure By Managers of Information Technology", *International Journal of Psychology*, 25, 735-750.
- [27] Brook, J. A. (1993) "Leisure meanings and comparisons with work", *Leisure Studies*, 12, 149-162.
- [28] Landfield, A. W. and Epting, R. E. (1987) *Personal Construct Psychology-Clinical and Personality Assessment*, Human Sciences Press, Inc, New York.
- [29] Norusis, M. J. (1994) *SPSS Professional Statistics 6.1*, SPSS Inc, Chicago.
- [30] Schiffman, S. S., Reynolds, M. L. and Young, F. W. (1981) *Introduction To Multidimensional Scaling*, Academic Press, New York.
- [31] Gordon, A. D. (1981) *Classification*, Chapman Hall, London.
- [32] Neimeyer, R. A. (1985) *The Development of Personal Construct Psychology*, University of Nebraska Press, Lincoln.

---

<sup>1</sup> The term Fuzzy-PCP has been used by Vladimir A. Geroimenko in a paper entitled *Personal Construct Theory and Fuzzy-Set Theory*. The paper was presented at the 2nd European Conference of the European Personal Construct Association, St Andreasberg, Germany, April 19-22, 1994. The author would like to express his appreciation to professor Geroimenko for the helpful correspondence on the potential for a Fuzzy-PCP.

<sup>2</sup> This is an extension of the work in [11]. In [11] reference is made only to *fuzzy subsets* and *ordinary subsets*. The terms *fuzzy construct subset*, *non-fuzzy construct subset* and *ordinary construct subset* are new. The extension is supported by Zadeh in [24] as the following illustrates:

Let  $U$  be the universe of objects which we can see. Let  $T$  be the set of terms *white, gray, green, blue, yellow, red, black*. Then each of these terms, e.g., *red*, may be regarded as a name for a fuzzy subset of elements of  $U$  which are red in color. Thus, the meaning of, *red*,  $M(\text{red})$ , is a specified fuzzy subset of  $U$ .

The ideas articulated above can be applied directly to modelling constructs as fuzzy subsets. It is for this reason that the term *fuzzy construct subset* has been introduced. In terms of PCP the elements of a grid are analogous to the *universe of objects*  $U$ . Constructs are analogous to the *set of terms* which can be used to describe the elements of  $U$ . For example, suppose a person is asked to name 8 people with whom they work. Constructs are then elicited about those people. One such construct might be *Manager Type/Non-Managerial*. The emergent pole of the construct *Manager Type*, identifies a *fuzzy construct subset* of which the elements of  $U$  (the work colleagues) may be full members, partial members or non-members. Thus following Zadeh [24] the meaning of *Manager Type*,  $M(\text{Manager Type})$  is a specified fuzzy construct subset of  $U$ .

<sup>iii</sup> In [23] the expression used to derive an alpha level measure of group consensus  $K_\alpha$  has 2 in the numerator. Using the data in [23] a manual recalculation of the  $K_\alpha$  produced results which could not be reconciled with those reported in [23]. In all cases the values derived for  $K_\alpha$  were double those reported in the paper. In some cases the  $K_\alpha$  exceeded 1.0. Eliminating 2 in the numerator rectified this problem. Equation (8) reflects this amendment.

<sup>iv</sup> In [23] the *root mean square* does not appear in the expression for deriving an estimate of group consensus  $K$ . The  $K_{\alpha_i}$  are found by multiplying the Consensus Matrices  $(C_{\alpha_i})_{ij}$  by their transpose and averaging the trace. Multiplying the Consensus Matrices by their transpose is equivalent to squaring them as shown in (8). Therefore, it seems sensible to apply the *root mean square* to the  $K_{\alpha_i}$  in (9).

**Acknowledgment.** The author would like to thank Dr Roger Wallace for valuable comments on earlier drafts of this paper and Mr George Nowara for providing programming assistance during the development of FUZZYGRID.

## BIBLIOGRAPHY

- Abidin, R. 1983, *Parenting Stress Index*, Pediatric Psychology Press, Charlottesville, VA.
- Ackermann, F., Eden, C. & Cropper, S. 1990, 'Cognitive mapping: A user's guide', Working paper No. 90/2, Department of Management Science, University of Strathclyde.
- Adams-Webber, J. R. 1979, *Personal Construct Theory: Concepts and Applications*, Wiley, New York.
- Adams-Webber, J. R. 1981, 'George A. Kelly as scientist-professional: an appreciation', in *Recent Advances in Personal Construct Technology*, ed. M. L. G. Shaw, Academic Press, London.
- Adams-Webber, J. R. 1982, 'Assimilation and contrast in personal judgement: The dichotomy corollary', in *The Construing Person*, eds. J. C. Mancuso & J. R. Adams-Webber, Praeger Publishers, New York.
- Adams-Webber, J. R. 1985, 'Construing self and others', in *Anticipating Personal Construct Psychology*, eds. F. R. Epting & A. W. Landfield, University of Nebraska Press.
- Adams-Webber, J. R. & Mancuso, J. C. (eds) 1983, *Applications of Personal Construct Theory*, Academic Press, Toronto.
- Adie, J. A. & Carmody, H. I. 1991, *Families at Work: Practical Examples from 140 Businesses*, Council for Equal Opportunity in Employment, Melbourne.
- Australian Government Publishing Service 1994, *Style Manual for Authors Editors and Printers*, 5<sup>th</sup> edn, AGPS Press, Canberra.
- Allport, G. W. 1937, *Personality: A Psychological Interpretation*, Holt, New York.
- Amatea, E. S., Cross, E. G., Clark, J. E. & Bobby, C. L. 1986, 'Assessing the work and family role expectations of career-oriented men and women: The life role salience scales', *Journal of Marriage and the Family*, vol. 48, pp. 831-838.
- Anderson, A. A. 1996, 'The Marriage of Personal Construct Psychology and Fuzzy Logic', in *Proceedings of The First International Discourse on Fuzzy Logic and The Management of Complexity*, eds. J. Dimitrov & V. Dimitrov, FLAMOC 96, Richmond, NSW.
- Anderson, A. A. 1998, 'A Model for Fuzzy Personal Construct Psychology', in *Fuzzy Systems Design: Social and Engineering Applications*, eds. L. Reznik, V. Dimitrov & J. Kacprzyk, Physica-Verlag, Heidelberg.
- Anderson, A. A., Goold, A. & Petter, B. 1994, 'Knowledge elicitation and representation using cognitive maps', Working Paper Series, no. 9420, Graduate School of Management, Deakin University, pp. 1-18.

- Anderson, J. A. & Poole, M. 1994, *Thesis and Assignment Writing*, 5<sup>th</sup> edn, Wiley, Brisbane.
- Anderson, D. R., Sweeney, D. J., Williams, T. A., Harrison, N. J. & Rickard, J. 1991, *Statistics for Business and Economics*, Harper educational, Artarmon, NSW, Australia.
- Appelbaum, S. A. 1969, 'The accidental eminence of George Kelly', *Psychiatry and Social Science Review*, vol. 3, pp. 20-25.
- Applegate, J. L. 1983, 'Construct system development, strategic complexity, and impression formation in persuasive communication', in *Applications of Personal Construct Theory*, eds. J. Adams-Webber & J. C. Mancuso, Academic Press, Toronto.
- Applegate, J. L., Kline, S. L. & Delia, J. G. 1982, 'Alternative measures of cognitive complexity as predictors of communication performance', in *Human Communication Theory: Comparative Essays*, ed. F. E. Dance, Harper & Row, New York.
- Arendell, T. (ed) 1997, *Contemporary Parenting: Challenges and Issues*, Sage, Thousand Oaks, California.
- Arthur, A. Z. 1966, 'Response bias in the semantic differential', *British Journal of Social and Clinical Psychology*, vol. 5, pp. 103-107.
- Australian Bureau of Statistics 1990, *Australian Standard Classification of Occupations*, Cat NO. 1223.0, ABS, Canberra.
- Australian Bureau of Statistics 1993, *Marriages and Divorces Australia*, Cat. No. 3310.0, ABS, Canberra.
- Australian Bureau of Statistics 1994, *Australian Social Trends*, Cat. No. 4102.0, ABS, Canberra.
- Australian Bureau of Statistics 1997, *Marriages and Divorces Australia*, Cat. No. 3310.0, ABS, Canberra.
- Australian Bureau of Statistics 1997, *Births Australia*, Cat. No. 3301.0, ABS, Canberra.
- Australian Bureau of Statistics 1997, *Australian Social Trends*, Cat. No. 4102.0, ABS, Canberra.
- Australian Bureau of Statistics 1997, *Labour Force Experience*, Cat. No. 6206.0, February 1997, ABS, Canberra.
- Australian Institute of Family Studies 1997, *Australian Family Profiles: social and demographic patterns*, AIFS, Melbourne.
- Axelrod, R. 1976, *The Structure of Decision*, Princeton University Press, New Jersey.

- Babbie, E. 1992, *The Practice of Social Research*, 6<sup>th</sup> edn., Wadsworth Publishing Company, Belmont, California.
- Baber, K. M. & Dreyer, A. S. 1986, 'Delayed childbearing: Men's thinking about the fertility decision', in *Men in Families*, eds. R. A. Lewis & R. E. Salt, Sage, Beverly Hills.
- Backett, K. 1987, 'The negotiation of fatherhood', in *Reassessing Fatherhood: New observations on fathers and the modern family*, eds. C. Lewis & M. O'Brien, Sage, London.
- Bahm, A. J. 1970, *Polarity, Dialectic, and Organicity*, Charles Thomas, Springfield, Illinois.
- Bakan, D. 1966, *The Duality of Human Existence*, Beacon Press, New York.
- Bannister, D. 1960, 'Conceptual structure in thought disordered schizophrenics', *Journal of Mental Science*, vol. 106, pp. 1230-1249.
- Bannister, D. 1962, 'The nature and measurement of schizophrenic thought disorder', *Journal of Mental Science*, vol. 108, pp. 825-842.
- Bannister, D. 1966, 'A new theory of personality', in *New Horizons in Psychology*, ed. B. Foss, Penguin, Baltimore.
- Bannister, D. (ed) 1970, *Perspectives in Personal Construct Theory*, Academic Press, London.
- Bannister, D. (ed) 1977, *New Perspectives in Personal Construct Theory*, Academic Press, London.
- Bannister, D. 1985, 'The experience of self', in *Anticipating Personal Construct Psychology*, eds. F. R. Epting & A. W. Landfield, University of Nebraska Press.
- Bannister, D. & Fransella, F. 1966, 'A grid test of schizophrenic thought disorder', *British Journal of Social and Clinical Psychology*, pp. 95-102.
- Bannister, D. & Fransella, F. 1971, *Inquiring Man: The Theory of Personal Constructs*, Penguin, Harmondsworth, England.
- Bannister, D. & Mair, J. M. M. 1968, *The Evaluation of Personal Constructs*, Academic Press, London.
- Barkley, M. L. 1993, 'Balancing work and family: The experience of new parents', *Australian Journal of Marriage and the Family*, vol. 14, no. 3, pp. 143-150.
- Barnett, R. C. & Baruch, G. K. 1985, 'Women's involvement in multiple roles and psychological distress', *Journal of Personality and Social Psychology*, Vol. 49, pp. 135-145.
- Barnett, R. C. & Baruch, G. K. 1987, 'Determinants of fathers' participation in family work', *Journal of Marriage and the Family*, vol. 49, Feb., pp. 29-40.

- Barnett, R. C., Marshall, N. L. & Pleck, J. H. 1992, 'Men's multiple roles and their relationship to psychological distress', *Journal of Marriage and the Family*, vol. 54, pp. 358-367.
- Bartlett, F. C. 1932, *Remembering: A Study in Experimental and Social Psychology*, Cambridge University Press, London.
- Baxter, J. & Western, M. 1997, 'Women's dissatisfaction with the domestic division of labour', *Family Matters*, no. 47, Winter, pp. 17-20.
- Bellman, R. E. & Zadeh, L. A. 1970, 'Decision-making in a fuzzy environment', *Management Science*, vol. 17, pp. B141-B164.
- Belsky, J. 1985, 'Exploring individual differences in marital change across the transition to parenthood: The role of violated expectations', *Journal of Marriage and the Family*, Nov., pp. 1037-1044.
- Belsky, J., Lang, M. E. & Rovine, M. 1985, 'Stability and change in marriage across the transition to parenthood: A second study', *Journal of Marriage and the Family*, Nov., pp. 855-865.
- Belsky, J. & Rovine, M. 1990, 'Patterns of marital change across the transition to parenthood: Pregnancy to three years postpartum', *Journal of Marriage and the Family*, vol. 52, Feb., pp. 5-19.
- Belsky, J., Spanier G. B. & Rovine, M. R. 1983, 'Stability and change in marriage across the transition to parenthood', *Journal of Marriage and the Family*, Aug., pp. 567-577.
- Berger P. L. & Luckmann, T. 1975, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, Penguin, Middlesex, England.
- Bernard, J. 1981, 'The good provider role; its rise and fall', *American Psychologist*, vol. 36, no. 1, pp. 1-12.
- Bernstein, B. 1961, 'Social class and linguistic development: a theory of social learning', in *Economy, Education & Society*, eds. A. H. Halsey, J. Floud & A. Anderson, New York.
- Berman, P. W. & Pederson, F. A. (eds) 1987, *Men's Transition to Parenthood: Longitudinal Studies of Early Family Experience*, Lawrence Erlbaum, Hillsdale, New Jersey.
- Bezdek, J. C., Spillman, B. & Spillman, R. 1977, 'Fuzzy measures of preference and consensus in group decision-making', in *Proceedings of IEEE CDC*, ed. K. S. Fu, vol. 2, IEEE Press, Piscataway.
- Bezdek, J. C., Spillman, B. & Spillman, R. 1978, 'A fuzzy relation space for group decision theory', *Fuzzy Sets and Systems*, vol. 1, pp. 255-268.
- Bezdek, J. C., Spillman, B. & Spillman, R. 1979, 'Fuzzy relation spaces for group decision theory: An application', *Fuzzy Sets and Systems*, vol. 2, 1979, pp. 5-14.

- Bieri, J. 1955, 'Complexity-simplicity and predictive behavior', *Journal of Abnormal Social Psychology*, vol. 51, pp. 263-268.
- Bieri, J. 1961, 'Complexity-simplicity as a personality variable in cognitive and preferential behavior', in *Functions of Varied Experience*, eds. D. W. Fiske & S. R. Maddi, The Dorsey Press, Homewood, Illinois.
- Bieri, J. 1966, 'Cognitive complexity and personality development', in *Experience, Structure and Adaptability*, ed. O. J. Harvey, Springer, New York.
- Binder, A. 1955, 'A statistical model for the process of visual recognition', *Psychological Review*, vol. 62, pp. 119-129.
- Bittman, M. 1995, *Recent Changes in Unpaid Work*, Cat. no. 4154.0, ABS, Canberra.
- Blin, J. M. 1974, 'Fuzzy relations in group decision theory', *Journal of Cybernetics*, vol. 4, pp. 17-22.
- Blin, J. M. & Whinston, A. B. 1974, 'Fuzzy sets and social choice', *Journal of Cybernetics*, vol. 3, pp. 28-36.
- Block, J. 1955, 'The difference between Q and R', *Psychological Review*, vol. 62, pp. 356-358.
- Bonarius, J. C. J. 1965, 'Research in personal construct theory', in *Progress in Experimental Personality Research*, vol. 2, ed. B. A. Maher, Academic Press, New York.
- Bradley, S. P., Hax, A. C. & Magnanti, T. L. 1977, *Applied Mathematical Programming*, Addison-Wesley, Reading, Massachusetts.
- Brent, S. B. 1984, *Psychological and Social Structures*, Lawrence Erlbaum, Hillsdale, New Jersey.
- Brinkerhoff, M. B. (ed) 1984, *Family and Work: Comparative Convergences*, Greenwood Press, Westport.
- Bronstein, P. 1988, 'Marital and parenting roles in transition', in *Fatherhood Today: Men's Changing Role in the Family*, eds. P. Bronstein & C. P. Cowan, Wiley, New York.
- Bronstein, P. & Cowan, C. P. (eds) 1988, *Fatherhood Today: Men's Changing Role in the Family*, Wiley, New York.
- Brook, J. A. & Brook, R. J. 1989, 'Exploring the meaning of work and nonwork', *Journal of Organizational Behaviour*, vol. 10, pp. 169-178.
- Brook, J. A. & Brook, R. J. 1993, 'Leisure meanings and comparisons with work', *Leisure Studies*, vol. 12, pp. 149-162.
- Brown, G. S. 1969, *Laws of Form*, George Allen & Unwin, London.

- Brown, R. 1958, 'Is a boulder sweet or sour', *Contemporary Psychology*, vol. 3, pp. 113-115.
- Brown, S. L. & Booth, A. 1996, 'Cohabitation versus marriage: A comparison of relationship quality', *Journal of Marriage and the Family*, vol. 58, pp. 668-678.
- Brown, S. M. 1992, 'Cognitive mapping and repertory grids for qualitative survey research: Some comparative observations', *Journal of Management Studies*, vol. 29, pp. 287-307.
- Bruner, J. S. 1956, 'You are your constructs', *Contemporary Psychology*, vol. 1, pp. 355-357.
- Brunswik, E. 1934, *Wahrnehmung und Gegenstandswelt (Perception and the world of Objects)*, Deuticke, Leipzig.
- Brunswik, E. 1956, *Perception and the Representative Design of Psychological Experiments*, University of California Press, Berkeley.
- Bruner, J. S. & Tagiuri, R. 1954, 'The perception of people' in *Handbook of Social Psychology*, Addison-Wesley, Cambridge, Mass.
- Burgess, A. 1997, *Fatherhood Reclaimed: The Making of the Modern Father*, Vermilion, London.
- Burrell, G. & Morgan, G. 1989, *Sociological Paradigms and Organizational Analysis*, Heinemann Educational Books, London.
- Butt, T. 1996, 'PCP: Cognitive or social psychology', in *Empirical Constructivism in Europe*, eds. J. W. Scheer & A. Catina, Psychosozial-Verlag, Giessen, Germany.
- Button, J. 1993, 'Man not by breadwinning alone', *Time Australia*, 12 July, pp. 36-44.
- Carraher, S. M. & Buckley, M. R. 1996, 'Cognitive complexity and the perceived dimensionality of pay satisfaction', *Personnel Psychology*, vol. 49, pp. 103-109.
- Carroll, J. D. & Chang, J. J. 1970, 'Analysis of individual differences in multidimensional scaling via an  $n$ -way generalization of "Eckart - Young" decomposition', *Psychometrika*, vol. 35, pp. 283-319.
- Cary, J. W. 1988, 'Information loss in grid analysis', in *Experimenting with Personal Construct Psychology*, eds. F. Fransella & L. Thomas, Routledge & Kegan Paul, London.
- Casey, C. 1995, *Work, Self and Society: After Industrialism*, Routledge, London.
- Cashdan, S. 1988, *Object Relations Therapy*, Norton & Company, New York.
- Cliff, N. 1987, *Analyzing Multivariate Data*, Harcourt Brace Jovanovich, San Diego.
- The Collins English Dictionary* 1986, 2<sup>nd</sup> edn, Collins Publishers, Sydney, Australia.



- Cook, E. P. 1985, *Psychological Androgyny*, Pergamon Press, New York.
- Cooney, T. M., Pedersen, F. A., Indelicato, S. & Palkovitz 1993, 'Timing of fatherhood: Is "on-time" optimal', *Journal of Marriage and the Family*, vol. 55, pp. 205-215.
- Cowan, P. 1988, 'Becoming a father', in *Fatherhood Today: Men's Changing Role in the Family*, eds. P. Bronstein & C. P. Cowan, Wiley, New York.
- Cowan, P. & Bronstein, P. 1988, 'Fathers' roles in the family: Implications for research, intervention and change', in *Fatherhood Today: Men's Changing Role in the Family*, eds. P. Bronstein & C. P. Cowan, Wiley, New York.
- Cowan, C. P. & Cowan, P. A. 1987, 'Men's involvement in parenthood: Identifying the antecedents and understanding the barriers', in *Men's Transitions to Parenthood: Longitudinal Studies of Early Family Experience*, eds. P. W. Berman & F. A. Pedersen, Lawrence Erlbaum, Hillsdale, New Jersey.
- Coxon, A. P. M. 1982, *The User's Guide to Multidimensional Scaling with Special Reference to the MDS(X) Library of Computer Programs*, Heinemann, London.
- Coxon, A. P. M., Davies, P. M., & Jones, C.L. 1986, *Images of Stratification: Occupational Structures and Class*, Sage, London.
- Craik, K. H., Hogan, R. & Wolfe, R. N. (eds.) 1993, *Fifty Years of Personality Psychology*, Plenum Press, New York.
- Crawford, D. W. & Huston, T. L. 1993, 'The impact of the transition to parenthood on marital lesiure', *Personality and Social Psychology Bulletin*, vol. 19, no. 1, pp. 39-46.
- Crockett, W. H. 1965, 'Cognitive complexity and impression formation', in *Progress in Experimental Personality Research*, ed. B. A. Maher, Academic Press, New York.
- Crohan, S. E. 1996, 'Marital conflict across the transition to Parenthood in African and American white couples', *Journal of Marriage and the Family*, vol. 58, pp. 933-944.
- Cronbach, L. J. 1958, 'Proposals leading to analytical treatment of social perception scores', in *Person Perception and Interpersonal behavior*, eds. R. Tagiuri & L. Petrullo, Stanford University Press, Stanford, California.
- Crouter, A., Huston, T. & Robbins, E. 1983, 'Bringing work home: Psychological spillover from work to family', Paper presented at the Theory and Method Workshop preceding the annual meeting of the National Council on Family Relations, St Paul,, Minnesota.
- Dalton, P. & Dunnett, G. 1990, *A Psychology for Living: Personal Constructs Theory for Professionals and Clients*, Peggy Dalton, London, England.
- Daly, K. 1992, 'The fit between qualitative research and characteristics of families', in *Qualitative Methods in Family Research*, eds. J. F. Gilgun, K. Daly & G. Handel, Sage, Newbury Park.

- Dancer, L. S. & Gilbert, L. A. 1993, 'Spouses' family work participation and its relation to wives' occupational level', *Sex Roles*, vol. 28, pp. 127-145.
- Deaux, K. 1987, 'Psychological Constructions of Masculinity and Femininity', in *Masculinity/ Femininity: Basic Perspectives*, eds. J. M. Reinisch, L. A. Rosenblum & S. A. Saunders, Oxford University Press, New York.
- Dempsey, K. 1997, 'Trying to get husbands to do more work at home', *Australia and New Zealand Journal of Sociology*, vol. 33, no. 2, pp. 216-225.
- Dench, G. 1996. *Transforming Men: changing patterns of dependency and dominance in gender relations*, Transaction Publishers, New Brunswick, New Jersey.
- de Vaus, D. & Wolcott I. (eds) 1997, *Australian Family Profiles: Social and Demographic Patterns*, Australian Institute of Family Studies, Melbourne, Australia.
- Devlin, K. 1993, *The Joy of Sets*, 2nd edn, Springer Verlag, New York.
- Dubin, R. 1956, 'Industrial workers' worlds. A study of the central life interests of industrial workers', *Social Problems*, vol. 3, pp. 131-142.
- Duck, S. 1979, 'The personal and the interpersonal in construct theory: Social and individual aspects of relationships', in *Constructs of Sociality and Individuality*, eds. P. Stringer & D. Bannister, Academic Press, London.
- Duxbury, L. E. & Higgins, C. A., 1991, 'Gender differences in work-family conflict', *Journal of Applied Psychology*, vol. 76, no. 1, pp. 60-74.
- Dyer, E. 1963, 'Parenthood as crisis: A restudy', *Marriage and Family Living*, vol. 25, pp. 196-201.
- Easterby-Smith, M. 1981, 'The design analysis and interpretation of repertory grids', in *Recent Advances in Personal Construct Technology*, ed. M. L. G. Shaw, Academic Press, London.
- Eden, C. 1988, 'Cognitive Mapping', *European Journal of Operations Research*, vol. 36, pp. 1-13.
- Eden, C. 1989, 'Using cognitive mapping for strategic options development and analysis (SODA)', in *Relational Analysis for a Problematic World: Methods for Complexity Uncertainty and Conflict*, ed. J. Rosenhead, Wiley, New York.
- Eden, C., & Ackermann, F. 1992, 'The analysis of cause maps', *Journal of Management Studies*, vol. 29, pp. 309-324.
- Eden, C., Ackermann, F. & Tait, A. 1993, 'Comparing cognitive maps: methodological issues', Working paper No. 93/4, Department of Management Science, University of Strathclyde.
- Edgar, D. 1995, 'Families and the social reconstruction of marriage and parenthood in Australia', in *Issues Facing Australian Families*, ed. W. Weeks, Longman, Melbourne, Australia.

- Edgar, D. 1997, *Men, Mateship, Marriage*, Harper Collins.
- Edley, N. & Wetherell, M. 1995, *Men in perspective: Practice, power and identity*, Prentice Hall/Harvester Wheatsheaf, Hertfordshire.
- Eisenhardt, K. M. 1989, 'Building theories from case study research', *Academy of Management Review*, vol. 14, pp. 532-550.
- Embacher, J. & Buttle, F. 1989, 'A repertory grid analysis of Austria's image as a summer vacation destination', *Journal of Travel Research*, Winter, pp. 3-7.
- Engels, F. 1942 (1884), *The Origin of the Family, Private Property, and the State*, International Publishers, New York.
- Epting, F. R. & Landfield, A. W. (eds), *Anticipating Personal Construct Psychology*, University of Nebraska Press, Lincoln.
- Erikson, E. 1963 (1950), *Childhood and Society*, Norton, New York.
- Erikson, E. 1968, *Identity: Youth and Crisis*, Norton, New York.
- Fallon, B. & Sycamore, P. 1997, The Work-Family interface: Are there shared perceptions within Families?, paper presented to Industrial and Organisational Psychology Conference, Melbourne, June.
- Festinger, L. 1957, *A Theory of Cognitive Dissonance*, Harper & Row, New York.
- Forgas, J. P. 1981, 'What is social about social cognition', in *Social Cognition: Perspectives on Everyday Understanding*, ed. J. P. Forgas, Academic Press, London.
- Forgas, J. P. 1983, 'Social skills and the perception of interaction episodes', *British Journal of Clinical Psychology*, vol. 22, pp. 195-207.
- Forgas, J. P. 1988, 'Affect in social and personal judgements', in *Affect Cognition and Social Behavior*, eds. K. Fiedler & J. Forgas, Hogrefe, Toronto.
- Fowlkes, M. R. 1987, 'Role combinations and role conflict: Introductory perspective', in *Spouse, Parent, Worker: On Gender and Multiple Roles*, ed. F. J. Crosby, Yale University Press, New Haven.
- Fransella, F. 1988, 'PCT: Still radical thirty years on', in *Experimenting with Personal Construct Psychology*, eds. F. Fransella & L. Thomas, Routledge & Kegan Paul, London.
- Fransella, F. & Bannister D. 1977, *A Manual for Repertory Grid Technique*, Academic Books, New York.
- Freud, S. 1985, *Civilisation, Society and Religion*, Vol. 12, The Pelican Freud Library, Pelican, New York.

- Frone, M. R., Russell, M. & Cooper, M. L. 1992, 'Antecedents and outcomes of work-family conflict: Testing a model of the work-family interface', *Journal of Applied Psychology*, vol. 77, pp. 65-78.
- Funder, K., Edgar, D., Whithear, D., Brownlee, H., Glezer, H., Harrison, M., Hartley, R., McDonald, P., Ochiltree, G. & Wolcott, I. 1996, 'Family studies in Australia', in *Intercultural Variation in Family Research and Theory: Implications for Cross-National Studies*, 2 vols, The Haworth Press Inc, New York.
- Fung, L. W. & Fu, K. S. 1975, 'An axiomatic approach to rational decision making in a fuzzy environment', in *Fuzzy Sets and their Applications to Cognitive and Decision Processes*, eds. L. A. Zadeh, K. S. Fu, K. Tanaka & M. Shimura, Academic Press, London.
- Gaines, B. R. & Shaw, M. L. G. 1981, 'New directions in the analysis and interactive elicitation of personal construct systems', in *Recent Advances in Personal Construct Technology*, ed. M. L. G. Shaw, Academic Press, London.
- Gaines, B. R. & Shaw, M. L. 1990, *RepGrid 2 V2.0a*, Centre for Person-Computer Studies, Calgary, Alberta, Canada.
- Gaines, B. R., Zadeh, L. A. & Zimmermann 1984, 'Fuzzy sets and decision analysis - A perspective', *TIMS/Studies in Management Sciences*, vol. 20, pp. 3-8.
- Geroimenko, V. A. 1994, 'Personal construct theory and fuzzy set theory', paper presented at the second conference of the European PCP association, St Andreasberg, Germany, 19-22 April.
- Geroimenko, V. A. 1996, 'Personal construct theory and fuzzy set theory', in *Empirical Constructivism in Europe*, eds. J. W. Scheer & A. Catina, Psychosozial-Verlag, Giessen, Germany
- Gersick, C. J. 1991, 'Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm', *Academy of Management Journal*, 1991, vol. 16, pp. 10-36.
- Gerson, K. 1997, 'The social construction of fatherhood', in *Contemporary Parenting: Challenges and Issues*, ed. T. Arendell, Sage, Thousand Oaks, California.
- Gilbert, L. A. 1993, *Two Careers/One Family*, Sage, Newbury Park.
- Gilgun, J. F., Daly, K. & Handel, G. (eds) 1992, *Qualitative Methods in Family Research*, Sage, Newbury Park.
- Gilmour, R. & Duck, S. 1986 (eds) *The Emerging Field of Personal Relationships*, Lawrence Erlbaum, Hillsdale, New Jersey.
- Ginsberg, A. 1989, 'Construing the business portfolio: A cognitive model of diversification', *Journal of Management Studies*, vol. 26, no. 4, pp. 417-438.
- Glezer, H. 1997, 'Cohabitation and Marriage Relationships in the 1990's', *Family Matters*, no. 47, pp. 5-9.

- Googins, B. K. 1991, *Work/Family conflicts: Private lives — Public responses*, Auburn House, Westport.
- Gordon, A. D. 1981, *Classification: Methods for the Analysis of Multivariate Data*, Chapman and Hall, London.
- Greenhaus, J. H. 1989, 'The intersection of work and family roles: Individual, interpersonal and organizational issues', in *Work and Family: Theory, Research and Applications*, Sage, Newbury Park.
- Greenhaus, J. H. & Beutell, N. J. 1985, 'Sources of conflict between work and family roles', *Academy of Management Review*, vol. 10, pp. 76–88.
- Griswold, R. E. 1993, *Fatherhood in America*, Basic Books, New York.
- Hackett, G., Lent, R. W. & Greenhaus, J. H. 1991, 'Advances in vocational theory and research: A 20-year retrospective', *Journal of Vocational Behavior*, vol. 38, pp. 3–38.
- Haggard, L. M. & Williams, D. R. 1992, 'Identity affirmation through leisure activities: Leisure symbols of the self', *Journal of Leisure Research*, vol. 24, pp. 1–18.
- Hall, C. S. & Lindzey, G. 1978, *Theories of Personality*, 3rd edn, Wiley, New York.
- Hamburg, M. 1983, *Statistical Analysis for Decision Making*, 3rd edn, Harcourt Brace Jovanovich, New York.
- Hays, W. L. 1958, 'An approach to the study of trait implication and trait similarity', in *Person Perception and Interpersonal behavior*, eds. R. Tagiuri & L. Petrullo, Stanford University Press, Stanford, California.
- Henwood, K. L. & Pidgeon, N. F. 1992, 'Qualitative research and psychological theorizing', *British Journal of Psychology*, vol. 83, pp. 97–111.
- Hesketh, B., Pryor, R., Gleitzman, M. & Hesketh, T. 1988, 'Practical applications and psychometric evaluation of a computerized fuzzy graphic rating scale', in *Fuzzy Sets in Psychology*, ed. T. Zetenyi, Elsevier Science Publishers, Amsterdam.
- Hiller, D. V. & Philliber, W. W. 1991, 'The division of labor in contemporary marriage: expectations, perceptions, and performance', in *Marriage and Family in transition*, eds. J. N. Edwards & D. H. Demo, Simon & Schuster, Needham Heights, MA.
- Hinkle, D. 1965, The change of personal constructs from the viewpoint of a theory of construct implications, PhD thesis, Ohio State University.
- Hohn, F. E. 1964, *Elementary Matrix Algebra*, 2nd edn, Macmillan, New York.
- Holland, R. 1970, 'George Kelly: Constructive innocent and reluctant existentialist', in *Perspectives in Personal Construct Psychology*, ed. D. Bannister, Academic Press, London.
- Huff, A. S. 1990, *Mapping Strategic Thought*, Wiley, Chichester.

- Hunt, J. G. & Hunt, L. L. 1986, 'The dualities of careers and families; new integrations or new polarizations?' in *Family in Transition; rethinking marriage, sexuality, child rearing, and family organisation*, eds. A. S. Skolnick & J. H. Skolnick, Little Brown and Company, Boston.
- Huston, T. L., McHale, S. M. & Crouter, A. C. 1986, 'When the honeymoon's over: Changes in marriage relationship over the first year', in *The Emerging Field of Personal Relationships*, eds. R. Gilmour & S. Duck, Lawrence Erlbaum, Hillsdale, New Jersey.
- Huston, T. L. & Robins, E. 1982, 'Conceptual and methodological issues in studying close relationships', *Journal of Marriage and the Family*, Nov., pp. 901-925.
- Ickes, W. & Knowles, E. S. (eds) 1982, *Personality, Roles and Social Behavior*, Springer-Verlag, New York.
- Isaacson, G. S. & Landfield, A. W. 1965, 'Meaningfulness of personal versus common constructs', *Journal of Individual Psychology*, vol. 21, pp. 160-166.
- Jahoda, M. 1988, 'The range of convenience of personal construct psychology - an outsider's view', in *Experimenting with Personal Construct Psychology*, eds. F. Fransella & L. Thomas, Routledge & Kegan Paul, London.
- Johnson-Laird, P. N. 1983, *Mental Models: Towards a Cognitive Science of Language, Inference, and Consciousness*, Harvard University Press, Cambridge, Massachusetts.
- Jones, R. E. 1954, 'Identification in terms of personal constructs', PhD thesis, Ohio State University.
- Jones, R. E. 1961, 'Identification in terms of personal constructs', *Journal of Consulting Psychology*, vol. 25, p. 276.
- Kabanoff, B. 1980, 'Work and nonwork: A review of models methods and findings', *Psychological Bulletin*, vol. 88, pp. 60-77.
- Kabanoff, B. & O'Brien, G. E. 1980, 'Work and leisure: A task attribute analysis', *Journal of Applied Psychology*, vol. 65, pp. 596-609.
- Kahn, W. A. 1990, 'Psychological conditions of personal engagement and disengagement at work', *Academy of Management Journal*, vol. 33, pp. 692-724.
- Kalmus, D., Davidson, A. & Cushman, L. 1992, 'Parenting expectations, experiences and adjustment to parenthood: A test of the violated expectations framework', *Journal of Marriage and the Family*, vol. 54, Aug., pp. 516-526.
- Kanter, R. M. 1977, *Work and Family in the United States: A Critical Review and Agenda for Research*, Russell Sage Foundation, New York.
- Kaplan, R. M. 1987, *Basic Statistics for the Behavioral Sciences*, Allyn and Bacon, Massachusetts.

- Kaufmann, A. 1975, *Introduction to the Theory of Fuzzy Subsets: Volume 1 fundamental theoretical elements*, Academic Press, New York.
- Kegan, R. 1992, *The Evolving Self*, Harvard University Press, Cambridge, Massachusetts.
- Kelly, G. A. 1955, *The Psychology of Personal Constructs*, 2 vols, Norton & Company, New York.
- Kelly, G. A. 1959, 'Nonparametric factor analysis of personality theories', *Journal of Individual Psychology*, vol. 19, pp. 115-147.
- Kelly, G. A. 1963, 'Discussion: Aldous, the personable computer', in *Computer Simulation of Personality*, eds. S. S. Tomkins & S. Messick, John Wiley & Sons, New York.
- Kelly, G. A. 1966, A brief introduction to personal construct theory, Unpublished manuscript. Brandeis University.
- Kelly, G. 1979, 'The psychotherapeutic relationship', in *Clinical Psychology and Personality*, ed. B. Maher, Academic Press, London.
- Kenny, V. 1988, 'Autopoiesis and alternativism in psychotherapy: fluctuations and reconstructions', in *Experimenting with Personal Construct Psychology*, eds. F. Fransella & L. Thomas, Routledge & Kegan Paul, London.
- Kickert, W. J. M. 1978, *Fuzzy Theories on Decision-Making*, Martinus Nijhoff, Liden.
- Kirchmeyer, C. 1993, 'Nonwork-to-work spillover: A more balanced view of the experiences of coping professional women and men', *Sex Roles*, vol. 28, nos. 9/10, pp. 531-552.
- Kline, M. & Cowan, P. A. 1989, 'Re-thinking the connections among "work" and "family" and well-being: A model for investigating employment and family work contexts', in *Work and Family: Theory Research and Applications*, ed. B. Goldsmith, Sage, Newbury Park.
- Kluwer, E. S., Jose, A. M., Heesink, & Evert VAN DE Vliert, 1996, 'Marital conflict about the division of household labor and paid work', *Journal of Marriage and the Family*, vol. 58, Nov., pp. 958-969.
- Kluwer, E. S., Jose, A. M., Heesink, & Evert VAN DE Vliert, 1997, 'The marital dynamics of conflict over the division of labour', *Journal of Marriage and the Family*, vol. 59, Aug., pp. 635-653.
- Knijjn, T. 1995, 'Towards posy-paternalism?: Social and theoretical changes in fatherhood', in *Changing Fatherhood: A Multidisciplinary Perspective*, ed. M. van Dongen, G. Frinking & M. Jacobs, Thesis Publishers, Amsterdam.

- Knowles, M. C. & Taylor, D. 1990, 'Conceptualizations of work, family and leisure by managers of information technology', *International Journal of Psychology*, vol. 35, pp. 735-750.
- LaRossa, R. 1983, 'The transition to parenthood and the social reality of time', *Journal of Marriage and the Family*, Aug., pp. 579-589.
- LaRossa, R. 1991, 'Fatherhood and social change', in *Marriage and Family in Transition*, eds. J. N. Edwards & D. H. Demo, Allyn & Bacon, Boston.
- LaRossa, R., Bennett, L. A. & Gelles, R. J. 1981, 'Ethical dilemmas in qualitative family research', *Journal of Marriage and the Family*, May, pp. 303-312.
- Lamb, M. E. 1975, 'Fathers: Forgotten contributors to child development', *Human Development*, vol. 18, pp. 245-266.
- Lamb, M. E. 1981, *The Role of the Father in Child Development*, Wiley, New York.
- Lamb, M. E. 1993, 'A review of Fatherhood in America: A History', In *Journal of Marriage and the Family*, vol. 55, pp. 1047-1049.
- Lamb, M. E., Pleck, J. H. & Levine, J. A. 1987, 'Effects of increased paternal involvement on fathers and mothers', in *Reassessing fatherhood; new observations on fathers and the modern family*, Sage, Beverly Hills, CA.
- Landfield, A. W. 1967, 'Grid-relationship scoring used with a rep test modification', *Psychological Reports*, vol. 21, pp. 19-23.
- Landfield, A. W. 1980, 'The person as a perspectivist, literalist, and chaotic fragmentalist', in *Personal Construct Psychology: Psychotherapy and Personality*, eds. A. W. Landfield & L. M. Leitner, Wiley, New York.
- Landfield, A. W. & Epting, F. R. 1987, *Personal Construct Psychology: Clinical and Personality Assessment*, Human Sciences, Press, New York.
- Landfield, A. W. & Leitner, L. M. 1980, *Personal Construct Psychology: Psychotherapy and Personality*, Wiley, New York.
- Langfield-Smith, K. & Wirth, A. 1992, 'Measuring the difference between cognitive maps', *Journal of the Operational Research Society*, vol. 43, pp. 1135-1150.
- Lang-Takac, E. & Zahava, O. 1992, 'Separateness and connectedness: Differences between the genders', *Sex Roles*, vol. 27, pp. 277-289.
- Leitner, M. 1985, 'Interview methodologies for construct Elicitation: Searching for the core', in *Anticipating Personal Construct Psychology*, eds. F. R. Epting & A. W. Landfield, University of Nebraska Press.
- Lee, S., Courtney, J. F. & O'Keefe, R. M. 1992, 'A system for organizational learning using cognitive maps', *OMEGA, International Journal of Management Science*, vol. 20, no. 1, pp. 23-36.



- LeMasters, E. E. 1957, 'Parenthood as crisis', *Marriage and Family Living*, Nov, pp. 352-355.
- Levinson, D. J. 1978, *The Seasons of a Man's Life*, Alfred A. Knopf, New York.
- Levinson, D. 1986, 'A conception of adult development', *American Psychologist*, vol. 41, pp. 3-13.
- Levy, L. H. 1956, 'Personal constructs and predictive behaviour', *Journal of Abnormal Social Psychology*, vol. 58, pp. 54-58.
- Levy, L. H. & Dugan R. D. 1956, 'A factorial study of personal constructs', *Journal of Consulting Psychology*, vol. 20, pp. 53-57.
- Lewin, K. 1936, *Principles of Topological Psychology*, McGraw-Hill, New York.
- Lewin, K. 1951, *Field Theory in Social Science*, Harper, New York.
- Lewis, C. & O'Brien, M. (eds) 1987, *Reassessing Fatherhood: New observations on Fathers and the Modern Family*, Sage, London.
- Lewis, R. A. 1986, 'Introduction: What men get out of marriage and parenthood', in *Men in Families*, eds. R. A. Lewis & R. E. Salt, Sage, Beverly Hills.
- Lifshitz, M. 1974, 'Quality professionals: Does training make a difference? A personal construct study of the issue', *British Journal of Psychology*, vol. 49, pp. 189-197.
- Lingoes, J. C., Roskam, E. E. & Borg, I. (eds) 1979, *Geometrical Representations of Relational Data*, Mathesis Press, Ann Arbor, Michigan.
- Lobel, S. A. 1991, 'Allocation of investment in work and family roles: Alternative theories and implications for research', *Academy of Management Review*, vol. 16, pp. 507-521.
- Lobel, S. A. & St Claire, L. 1992, 'Effects of family responsibilities, gender, and career identity salience on performance outcomes', *Academy of Management Journal*, vol. 35, pp. 1057-1069.
- Loscocco, K. A., & Roschelle, A. R. 1991, 'Influences on the quality of work and nonwork life: Two decades in review', *Journal of Vocational Behavior*, vol. 39, pp. 182-225.
- Lyle, W. H. 1953, A comparison of emergence and value as determinants of selective perception, PhD thesis, Ohio State University.
- MacDermid S. M., Huston, T. L. & McHale, 1990, 'Changes in marriage associated with the transition to parenthood: Individual differences as a function of sex-role attitudes and changes in the division of household labor', *Journal of Marriage and the Family*, vol. 52, May, pp. 475-486.
- MACNEILL, K. 1995, *The Future of Work*, Brotherhood of St Laurence, Melbourne, Australia.

*The Macquarie Dictionary* 1997, 3<sup>rd</sup> edn, The Macquarie Library Pty Ltd.

Maher, B. A. ed. 1965, *Progress in Experimental Personality Research*, Academic Press, New York.

Mair, J. M. M. 1967, 'Some problems in repertory grid measurement: the use of bipolar constructs' *British Journal of Psychology*, vol. 58, pp. 261-270.

Markus, H. & Oyserman, D. 1989, 'Gender and thought: The role of the self-concept' in *Gender and Thought: Psychological perspectives*, eds. M. Crawford & M. Gentry, Springer-Verlag New York.

Mancuso, J. C. & Adams-Webber J. R. (eds) 1982, *The Construing Person*, Praeger Publishers, New York.

Mancuso, J. C. & Adams-Webber, J. R. 1982, 'Personal construct psychology as personality theory: Introduction', in *The Construing Person*, eds. J. C. Mancuso & J. R. Adams-Webber, Praeger Publishers, New York.

Mancuso, J. C. & Shaw, M. L. G. (eds) 1987, *Cognition and Personal Structure: Computer Access and Analysis*, Praeger, New York.

Mao Tsetung, 1937, *Five Essays on Philosophy*, Foreign Language Press, Peking.

McAdams, D. P. 1997, 'A conceptual history of personality psychology', in *Handbook of Personality Psychology*, eds. R. Hogan, J. Johnson, & S. Briggs, Academic Press, San Diego, California.

McCoy, M. 1980, 'Further explorations of the culture-shocked marriage hypothesis: The exceptions', *Hong Kong Psychological Society-Bulletin*, no. 5, July, pp. 17-28.

McCoy, M. 1983, 'Personal construct theory and methodology in intercultural research', in *Applications of Personal Construct Theory*, eds. J. Adams-Webber & J. C. Mancuso, Academic Press, Toronto.

McDougall, W. 1931, *An Introduction to Social Psychology*, 22<sup>nd</sup> edn, Methuen, London.

McGee, V. C. 1968, 'Multidimensional scaling of n sets of similarity measures: A nonmetric individual differences approach' *Multivariate Behavioral Research*, vol. 3, pp. 233-342.

McKenry, P. C., Price, S. J., Gordon, P. B. & Rudd, N. M. 1986, 'Characteristics of husbands' family work and wives' labor force involvement', in *Men in Families*, eds. R. A. Lewis & R. E. Salt, Sage, Beverly Hills.

Miles, M. & Huberman, A. M. 1984, *Qualitative Data Analysis*, Sage, Beverly Hills, California.

- Millis, K. K. & Neimeyer, R. A. 1990, 'A test of the dichotomy corollary: Propositions versus constructs as basic cognitive units', *International Journal of Personal Construct Psychology* vol. 3, pp. 167-181.
- Morgan, G. & Smircich, L. 1980, 'The case for qualitative research', *Academy of Management Review*, vol. 5, pp. 491-500.
- Munder-Ross, J. 1994, *What Men Want*, Harvard University Press, Cambridge, Massachusetts.
- Neimeyer, R. A., 1985, *The Development of Personal Construct Psychology*, University of Nebraska Press, Lincoln.
- Nordstrom, B. 1986, 'Why men get married: More or less traditional men compared', in *Men in Families*, eds. R. A Lewis & R. E. Salt, Sage, Beverly Hills.
- Norusis, M. J. 1988, *The SPSS Guide to Data Analysis*, SPSS Inc, Chicago.
- Norusis, M. J. 1994, *SPSS Professional Statistics 6. 1*, SPSS Inc, Chicago.
- Nosofsky, R. M. 1992, 'Similarity scaling and cognitive process models', *Annual Review of Psychology*, vol. 43, pp. 25-53.
- Nystedt, L. & Magnusson, D. 1982, 'Construction of Experience: the construction corollary', in *The Construing Person*, eds. J. C. Mancuso & J. R. Adams-Webber, Praeger, New York.
- Nystedt, L. 1983, 'The situation: a constructivist approach', in *Applications of Personal Construct Theory*, Academic Press, Canada.
- Oakley, A. 1974, *Housewife*, Allen Lane, London.
- Oppenheim, A. N. 1992, *Questionnaire Design, Interviewing and Attitude Measurement*, Pinter Publishers, London.
- Orthner, D. K., & Pittman, J. F. 1986, 'Family contributions to work commitment', *Journal of Marriage and the Family*, vol. 48, pp. 573-581.
- Osgood, C. E. 1952, 'The nature and measurement of meaning', *Psychological Bulletin*, vol. 49, pp. 197-237.
- Osgood, C. E. 1962, 'Studies on the generality of affective meaning systems', *American Psychologist*, vol. 17, pp. 10-28.
- Osgood, C. E., Suci, G.J. & Tannenbaum, P. J. 1957, *The Measurement of Meaning*, University of Illinois Press, Urbana.
- Osherson, S. & Dill, D. 1983, 'Varying work and family choices: Their impact on men's work satisfaction', *Journal of Marriage and the Family*, May, pp. 339-346.
- Osherson, D. N. & Smith, E. E. 1981, 'On the adequacy of prototype theory as a theory of concepts', *Cognition*, vol. 9, pp. 35-38.

- Osherson, D. N. & Smith, E. E. 1982, 'Gradedness and conceptual combination', *Cognition*, vol. 12, pp. 299-318.
- Pearson, K. 1951, *The Grammar of Science*, J. M. Dent & Sons Ltd, London.
- Pease, B. & Wilson, J. 1995, 'Men in families: Moving beyond patriarchal relations', in *Issues Facing Australian Families*, ed. W. Weeks, Longman, Melbourne, Australia.
- Pepper, S. C. 1942, *World Hypotheses*, University of California Press, Berkeley.
- Perrucci, C. C., Potter, H. R. & Rhoads, D. L. 1978, 'Determinants of male family-role performance', *Psychology of Women Quarterly*, vol. 3, pp. 53-77.
- Perry, C. 1994, 'A structured approach to presenting PhD theses: Notes for candidates and their supervisors', Paper presented to the ANZ Doctoral Consortium, University of Sydney, March.
- Pervin, L. 1973, 'On construing our constructs. A review of Bannister and Fransella's *Inquiring Man: The Theory of Personal Constructs*', *Contemporary Psychology*, vol. 18, pp. 110-112.
- Piaget, J. 1971 (1950), *The Psychology of Intelligence*, Routledge Kegan Paul, London.
- Pleck, J. H. 1977, 'The work-family role systems', *Social Problems*, vol. 24, pp. 417-427.
- Pleck, J. H. 1983, 'Husband's roles', in *Research in the Interweave of Social roles: Families and Jobs*, eds. H. Z. Lopata & J. H. Pleck, vol. 3, JAI Press Inc., Greenwich, Connecticut.
- Pleck, J. H. 1985, *Working Wives/Working Husbands*, Sage, Beverly Hills, California.
- Polanyi, M. 1958, *Personal Knowledge*, Routledge & Kegan Paul, London.
- Polanyi, M. 1966, *The Tacit Dimension*, Doubleday, New York.
- Polkinghorne, D. E. 1984, 'Further extensions of methodological diversity for counseling psychology', *Journal of Counseling Psychology*, vol. 31, pp. 416-429.
- Poole, M. E. & Langan-Fox, J. 1992, 'Conflict in women's decision making about multiple roles', *Australian Journal of Marriage and the Family*, vol. 13, no. 1, pp. 2-18.
- Protter, M. H. & Morrey, C. B. 1972, *Calculus with Analytical Geometry: A First Course*, 2<sup>nd</sup> edn, Addison Wesley, Reading, Massachusetts.
- Quillian, M. R. 1968, 'Semantic memory', in *Semantic Information Processing*, ed. M. Minsky, MIT Press, Cambridge, MA.

- Rapoport, R. & Rapoport, R. N. 1969, 'The dual career family: A variant pattern and social change', *Human Relations*, vol. 22, pp. 3-30.
- Rapoport, R. & Rapoport, R. N. 1976, *Dual-Career Families Re-examined: New Integrations of Work & Family*, Martin Roberston & Company, London.
- Reger, R. K. 1990, 'The repertory grid technique for eliciting the content and structure of cognitive constructive systems', in *Mapping Strategic Thought*, ed. A. S. Huff, Wiley, New York.
- Reid, F. 1979, 'Personal constructs and social competence' in *Constructs of Sociality and Individuality*, eds. P. Stringer & D. Bannister, Academic Press, London.
- Reinisch, J. M., Rosenblum, L. A. & Sanders, S. (eds) 1987, *Masculinity/ Femininity: Basic Perspectives*, Oxford University Press, New York.
- Resnick, J. & Landfield, A. W. 1961, 'The oppositional nature of dichotomous constructs', *The Psychological Record*, vol. 11, pp. 47-55.
- Riach, L. 1981, 'Father — The other partner a survey of current knowledge', *Australian Journal of Early Childhood*, vol. 6, no. 2, pp. 29-34.
- Riemann, R. 1990, 'The bipolarity of personal constructs', *International Journal of Personal Construct Psychology*, vol. 3, pp. 149-165.
- Riemann, R. 1996, 'The dichotomy corollary: basic or superfluous?', in *Empirical Constructivism in Europe*, eds. J. W. Scheer & A. Catina, Psychosozial-Verlag, Giessen, Germany
- Riley, S. & Palmer, J. 1975, 'Of attitudes and latitudes: A repertory grid study of perceptions of seaside resorts', *Journal of the Market Research Society*, vol. 17, April, pp. 4-89.
- Rusbult, C. E. 1980, 'Commitment and satisfaction in romantic associations: A test of the investment model', *Journal of Experimental Social Psychology*, vol. 16, pp. 172-186.
- Russell, G. 1983a, *The Changing Role of Fathers*, University of Queensland Press, St Lucia.
- Russell, G. 1983b, 'A cognitive mediational approach to observing and understanding social interactions', paper presented to the symposium on Observational Methods in the Study of Social Interaction, Society for the study of Behavioral Development, Munich.
- Russell, G. 1993, 'Work and family audits of Australian workplaces: An employee prespective', paper presented to Work & Family: The Corporate Challenge, Melbourne, December 1.
- Russell, G. 1997, quoted in 'Corporate dads', *Australian Financial Review Magazine*, Sep., p. 37.

- Rychlak, J. 1991, 'The missing psychological links of artificial intelligence predication and opposition', *International Journal of Personal Construct Psychology*, vol. 4, pp. 241-229.
- Sarantakos, S. 1991, 'Cohabitation revisited: Paths to change among cohabiting and non-cohabiting couples', *Australian Journal of Marriage and the Family*, vol. 12, no. 3, pp. 144-155.
- Sarantakos, S. 1994, 'Unmarried cohabitation: Options, limits and possibilities', *Australian Journal of Marriage and the Family*, vol. 15, no. 3, pp. 148-160.
- Sarbin, T. R., & Kitsuse, J. I. (eds) 1994, *Construing The Social*, Sage, London.
- Scanlon, T. K., Carpenter, P. J., Schmidt, G. W., Simons, J. P. & Keeler, B. 1993, 'An introduction to the sport commitment model', *Journal of Sport and Exercise Psychology*, vol. 15, pp. 1-15.
- Schiffman, S. S., Reynolds, M. L. & Young, F. W. 1981, 'Introduction to Multidimensional Scaling', Academic Books, New York.
- Schoen, R. & Weinick, R. M. 1993, 'Partner choice in marriages and cohabitation', *Journal of Marriage and the Family*, vol. 55, May, pp. 408-414.
- Schwartz, F. 1974 (ed), *Scientific Thought and Social Reality*, International Universities Press, New York.
- Schwartz, D. & Lacey, H. 1982, *Behaviorism, Science and Human Nature*, Norton and Company, New York.
- Scott, S. M., Stanley, S. M. & Markman, H. J. 1992, 'Assessing commitment in personal relationships', *Journal of Marriage and the Family*, vol. 54, pp. 595-608.
- Scott, W. A. 1962, 'Cognitive complexity and cognitive flexibility', *Sociometry*, vol. 25, pp. 405-414.
- Scott, W. A. 1963, 'Cognitive complexity and cognitive balance', *Sociometry*, vol. 26, pp. 67-74.
- Seidler, V. J. 1989, *Rediscovering Masculinity: Reason, Language and Sexuality*, Routledge, London.
- Sekaran, U. 1986, *Dual Career Families*, Jossey-Bass, San Francisco.
- Sekaran, U. 1992, *Research Methods for Business: A Skill Building Approach*, 2<sup>nd</sup> edn, Wiley, New York.
- Shamir, B. 1992, 'Home: the perfect workplace?' in *Work, Families and Organizations*, ed. S. Zedek, Jossey-Bass, San Francisco.
- Shamir, B. 1992, 'Some correlates of leisure identity salience: Three exploratory studies', *Journal of Leisure Research*, vol. 24, pp. 301-323.

- Shanteau, J. 1987, 'Psychological characteristics of expert decision makers', in *Expert Judgement and Expert Systems*, eds. J. L. Mumpower, L. D. Phillips, O. Renn & V. R. R. Uppuluri, Springer-Verlag, Berlin.
- Shaw, M. L. G. 1980a, *On Becoming a Personal Scientist*, Academic Press, London.
- Shaw, M. L. G. 1980b, 'The analysis of a repertory grid', *British Journal of Medical Psychology*, vol. 53, pp. 117-126.
- Shaw, M. L. G. (ed) 1981a, *Recent Advances in Personal Construct Technology*, Academic Press, London.
- Shaw, M. L. G. 1981b, 'Conversational heuristics for eliciting shared understanding', in *Recent Advances in Personal Construct Technology*, Academic Press, London.
- Shaw, M. L. G. 1985, 'Communities of knowledge' in *Anticipating Personal Construct Psychology*, eds. F. R. Epting & A. W. Landfield, University of Nebraska Press.
- Shaw, M. L. G. & Gaines, B. R. 1981, 'Recent advances in the analysis of a repertory grid', *British Journal of Medical Psychology*, vol. 54, pp. 307-318.
- Shaw, M. L. G. & Gaines, B. R. 1984, 'Deriving the constructs underlying decision', *TIMS/ Studies in Management Science*, vol 20, pp. 335-355.
- Shaw, M. L. G. & Gaines, B. R. 1992, 'Kelly's "geometry of psychological space" and its significance for cognitive modeling', *Knowledge Science Institute, University of Calgary*, Calgary, pp. 1-14.
- Shaw, M. L. G. & Thomas, L. F. 1978, 'FOCUS on education—an interactive computer system for the development and analysis of repertory grids', *Journal of Man-Machine Studies*, vol. 10, pp. 139-173.
- Sheehy, G. 1976, *Passages*, Dutton, New York.
- Sherif, M. & Sherif C. W. 1970, 'Attitudes as the individual's own categories: the social judgement-involvement approach to attitude and attitude change', in *Attitude Measurement*, ed. G. F. Summers, Rand McNally, Chicago.
- Siavelis, R. L. & Lamke, L. K. 1992, 'Instrumentalness and Expressiveness; Predictors of Heterosexual Relationship Satisfaction', *Sex Roles*, vol. 26, pp. 149-159.
- Singer, J. A. & Salovey, P. 1993, *The Remembered Self*, The Free Press, New York.
- Slater, P. (ed) 1976, *The Measurement of Intrapersonal Space by Grid Technique*, vol. 1, *Explorations of Intrapersonal Space*, Wiley, London.
- Slater, P. 1977, *The Measurement of Intrapersonal Space by Grid Technique*, vol. 2, *Dimensions of Intrapersonal Space*, Wiley, London.
- Small, S. A. & Riley, D. 1990, 'Towards a multidimensional assessment of work spillover into family life', *Journal of Marriage and the Family*, vol. 52, Feb., pp. 51-61.

- Smith, L. D. 1986, *Behaviorism and Logical Positivism: A Reassessment of the Alliance*, Stanford University Press, Stanford, California.
- Smithson, M. 1987, *Fuzzy Set Analysis for the Behavioural and Social Sciences*, Springer Verlag, New York.
- Spence, J. T. & Helmreich, R. L. 1978, *Masculinity & Femininity: Their Psychological Correlates, & Antecedents*, University of Texas Press, Austin.
- Spillman, B., Bezdek J. & Spillman, R. 1979a, 'Development of an instrument for the dynamic measurement of consensus', *Communication Monographs*, vol. 46, March, pp. 1-12.
- Spillman, B., Bezdek J. & Spillman, R. 1979b, 'Coalition analysis with fuzzy sets', *Kybernetes*, vol. 8, pp. 203-211.
- Spillman, B., Spillman, R., & Bezdek, J. 1980, 'A fuzzy analysis of consensus in small groups', in *Fuzzy Sets: Theory and Applications to Policy Analysis and Information Systems*, eds. P. P. Wang & S. K. Chang, Plenum Press, New York.
- Stagner, R. 1937, *Psychology of Personality*, McGraw-Hill, New York.
- Stebbins, R. A. 1982, 'Serious leisure: A conceptual statement', *Pacific Sociological Review*, vol. 25, pp. 251-272.
- Stewart, V. & Stewart, A. 1981, *Business Applications of Repertory Grid*, McGraw-Hill, London.
- Stringer, P. 1979, 'Individuals, roles and persons', in *Constructs of Sociality and Individuality*, eds. P. Stringer & D. Bannister, Academic Press, London.
- Stringer, P. & Bannister, D. 1979, *Constructs of Sociality and Individuality*, Academic Press, London.
- Stryker, S. 1980, *Symbolic Interactionism: A Social Structural Version*, Benjamin Cummings, Menlo Park, California.
- Stryker, S. 1987, 'Identity theory: Developments and extensions', in *Self and Identity: Psychological Perspectives*, eds. K. Yardley & T. Honess, Wiley, New York.
- Tagiuri, R., & Petrullo, L. (eds) 1958, *Person Perception and Interpersonal Behavior*, Stanford University Press, Stanford, California.
- Tajfel, H. & Turner, J. C. 1986, 'The social identity theory of intergroup behavior', in *Psychology of Intergroup Relations*, 2<sup>nd</sup> edn., eds. S. Worchel & W. G. Austin, Nelson Hall, Chicago.
- Thoits, P. A., 1987, 'Negotiating Roles', in *Spouse Parent Worker: On Gender and Multiple Roles*, ed. F. J. Crosby, Yale University Press, New Haven.
- Thoits, P. A. 1992, 'Identity structure and psychological well-being: Gender and marital status comparisons', *Social Psychology Quarterly*, vol. 58, no. 3, pp. 236-256.



- Thurstone, L. L. 1928, 'Attitudes can be measured', *The American Journal of Sociology*, vol. 33, no. 4, pp. 529-554.
- Tolman, E. C. 1948, 'Cognitive maps in rats and men', *Psychological Review*, vol. 55, pp. 189-208.
- Tomkins, S. S. 1979, 'Script theory: Differential magnification of affects', in *Nebraska Symposium on Motivation*, eds. H. E. Howe and R. A. Dienstbier, vol. 26, pp. 201-236.
- Tomkins, S. S. 1987, 'Script theory' in *The Emergence of Personality*, eds. J. Aranoff, A. I. Rabin & R. A. Zucker, Springer, New York.
- Tripodi, T. & Bieri, J. 1963, 'Cognitive complexity as a function of own and provided constructs', *Psychological Reports*, vol. 13, p. 36.
- Tschudi, F. 1983, 'Constructs are hypotheses', in *Applications of Personal Construct Theory*, eds. J. Adams-Webber & J. C. Mancuso, Academic Press, Toronto.
- van den Berg, G. M., Heiser, W. J. & Commandeur, J. F. 1992, 'Comparing repertory grids to integrate knowledge from multiple statisticians', *Knowledge Acquisition*, vol. 4, pp. 259-278.
- van den Berghe, P. L. 1984, 'Family and work; a sociobiological view', in *Family and Work; Comparative Convergencies*, ed. M. B. Brinkerhoff, Greenwood Press, Westport.
- Vandenheuvel, A. 1993, *When Roles Overlap: Workers with Family Responsibilities*, Australian Institute of Family Studies, Melbourne.
- Van Dongen, M., Frinkling, G. & Jacobs, M. (eds) 1995, *Changing Fatherhood: A Multidisciplinary Perspective*, Thesis Publishers, Amsterdam.
- van der Ven, A. H. G. S. 1980, *Introduction to Scaling*, Wiley, London.
- Viney, L. L. 1980, *Transitions*, Cassell, Melbourne.
- Voydanoff, P. 1989, 'Work and family: A review and expanded conceptualization', in *Work and Family: Theory Research and Applications*, ed. B. Goldsmith, Sage, Newbury Park.
- Wacker, G. J. 1981, 'Towards a cognitive methodology of organizational assessment', *Journal of Applied Behavioral Science*, vol. 17, pp. 114-129.
- Wajcman, J. 1996, 'Working for the man', *Eureka Street*, vol. 6, no. 9, pp. 56-58.
- Wallace, P. M. & Gotlib, I. H. 1990, 'Marital adjustment during the transition to parenthood: Stability and predictors of change', *Journal of Marriage and the Family*, vol. 52, Feb., pp. 21-29.
- Waller, W. 1938, *The family: A Dynamic Interpretation*, Cordon, New York.

- Warren, N. 1964, 'Constructs rules and the explanation of behavior', Paper presented to the Symposium on Personal Construct Theory and Repertory Grid Methodology, Brunel University.
- Warren, N. 1966, 'Social class and construct systems: An examination of the cognitive structure of two social class groups', *British Journal of Social and Clinical Psychology*, vol. 5, pp. 254-263.
- Wegner, D. M. & Giuliano, T. 1982, 'The forms of social awareness', in *Personality, Roles and Social Behavior*, eds. W. Ickes & E. S. Knowles, Springer-Verlag, New York.
- Welkowitz J., Ewen R. B. & Cohen J. 1976, *Introductory Statistics for the Behavioral Sciences*, 2nd edn., Academic Press, London.
- Winter, D. A. 1992, *Personal Construct Psychology in Clinical Practice: Theory, Research and Applications*, Routledge, London.
- Wolcott, I. 1987, 'Workers with family responsibilities: Implications for Employers', *Discussion Paper Number 14*, Australian Institute of Family Studies, Melbourne, Australia.
- Wolcott, I. 1990, 'Between tradition and transition: Workers with family responsibilities', *Australian Journal of Social Issues*, vol. 25, pp. 291-300.
- Wolcott, I. 1995, 'Maintaining family life: balancing family care and income', paper presented at the Marriage Education Conference, Melbourne, 1995.
- Wundt, W. 1907, *Outlines of Psychology*, Wilhelm Engelmann, Leipzig.
- Wynn-Reeves, J. 1965, *Thinking About Thinking: Studies in the Background of Some Psychological Approaches*, Secker and Warburg, London.
- Yin, R. K. 1989, *Case Study Research: Design and Methods*, Sage Publications, London.
- Young, F. W. & Harris, D. F. 1994, 'Multidimensional Scaling', in *SPSS Professional Statistics 6. 1*, ed. M. J. Norusis, SPSS Inc, Chicago.
- Zadeh, L. A. 1962, 'From circuit theory to system theory', *Proceedings of the Institute of Radio Engineers*, vol. 50, pp. 856-865.
- Zadeh, L. A. 1965, 'Fuzzy sets', *Information and Control*, vol. 8, pp. 338-353.
- Zadeh, L. A. 1971, 'Quantitative fuzzy semantics', *Information Sciences*, vol. 3, pp. 159-176.
- Zadeh, L. A. 1973, 'Outline of a new approach to the analysis of complex systems and decision processes', *IEEE Transactions on Systems, Man and Cybernetics*, Vol. SMC-3, no. 1, Jan.

- Zadeh, L. A. 1975, 'The concept of a linguistic variable and its application to approximate reasoning-I' *Information Sciences*, vol. 8, pp. 199-249.
- Zadeh, L. A. 1975, 'The concept of a linguistic variable and its application to approximate reasoning-II' *Information Sciences*, vol. 8, pp. 301-357.
- Zadeh, L. A., Fu, K. S., Tanaka, K. & Shimura, M. 1975, eds. *Fuzzy Sets and Their Applications to Cognitive and Decision Processes*, Academic Press, London.
- Zaff, B. S., McNeese, M. D. & Snyder, D. E. 1993, 'Capturing multiple perspectives: A user centered approach to knowledge and design acquisition', *Knowledge Acquisition*, vol. 5, pp. 79-116.
- Zajonc, R. B. 1980, 'Feeling and thinking: Preferences need no inferences', *American Psychologist*, vol. 35, no. 2, pp. 151-175.
- Zedeck, S. 1992, 'Introduction: Exploring the domain of work and family concerns', in *Work, Families and Organizations*, ed. S. Zedeck, 1992.
- Zedeck, S., Maslach, C., Mosier, K. & Skitka, L. 1989, 'Affective responses to work and quality of family life: Employee and Spouse perspectives', in *Work and Family: Theory Research and Applications*, ed. E Goldsmith, Sage, Newbury Park.
- Zedeck, S. & Mosier, K. 1990, 'Work in the Family and employing organization', *American Psychologist*, February, pp. 240-251.
- Zuriff, G. E. 1985, *Behaviorism: A Conceptual Reconstruction*, Columbia University Press, New York.