

**RETHINKING WORK: JOB CRAFTING, SELF-DETERMINATION, AND EMPLOYEE
WELL-BEING**

by

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SUMMARY

This dissertation explores the concept of employee well-being, with a view to uncover additional and useful ways in which it can be enhanced in individuals. Previous literature in this area had primarily focused on ways in which to enhance the mental health of the general adult population, and had thus remained relatively silent about work specific types of interventions. Preliminary findings have suggested, however, that various forms of activities may form the basis for an effective intervention aimed at working populations. Specifically, previous research suggests that the practice of job crafting may provide employees with an effective way in which to enhance their engagement and job satisfaction. Hence, the research conducted in this dissertation addresses two primary questions: (1): *How do researchers empirically measure job crafting, and are job crafting activities empirically distinguishable along the three dimensions of task, relational, and cognitive forms of job crafting?*; (2) *Does job crafting yield a significant relationship with employee well-being, and if so, what are the theoretical mechanisms that explain this relationship?* A scale validation study was conducted to examine the subcomponents of job crafting and whether job crafting activities are empirically distinguishable along the task, relational, and cognitive forms of crafting. The Job Crafting Questionnaire was the outcome of this study and it provides researchers with a new and theoretically driven tool that they can continue to validate and progress job crafting research.

A model is then proposed and tested which suggests that job crafting activities predict the three intrinsic employee needs for autonomy, competence, and relatedness, which, in turn, predicts employee well-being. This empirical model was supported in a sample of 253 working adults and hence provides some of the first empirical insights as to the efficacy of job crafting activities in enhancing employee

mental health. This research offers practitioners a useful underpinning to guide the development of interventions aimed at enhancing employee mental health and well-being.

PART A: General Declaration

Monash University

Declaration for thesis based or partially based on conjointly published or unpublished work

General Declaration

In accordance with Monash University Doctorate Regulation 17 Doctor of Philosophy and Research Master's regulations the following declarations are made:

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

This thesis includes no original papers published in peer reviewed journals but 3 original unpublished publications. The core theme of the thesis is employee well-being. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the candidate, working within the School of Psychology and Psychiatry and under the supervision of Dr Dianne Vella-Brodrick.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of chapters two, four, and six my contribution to the work involved the following:

Thesis chapter	Publication title	Publication status*	Nature and extent of candidate's contribution
2	Positive psychology and the workplace: The business case for psychological need satisfaction and employee well-being	Under review	75%
4	The Job Crafting Questionnaire: A new scale to measure the extent to which employees engage in job crafting	Under review	75%
6	Optimising employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-being	Accept with revisions	75%

[* For example, 'published' / 'in press' / 'accepted' / 'returned for revision']

I have not renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

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Date: ...2/5/2013.....

CHAPTER 1

INTRODUCTION

THE NEED FOR EMPLOYEE WELL-BEING

Introduction

The Need for Employee Well-Being

Paid employment has a significant influence on the health and quality of life of most adults. It is an important source from which to develop relationships and support networks with others, create opportunities for meaningful activities, and create a sense of identity. Most people view work as more than a means to obtain material benefits such as money and security, and research has charted trends suggesting most adults would continue to work even if they had all the money they needed (Wrzesniewski, Rozin, & Bennett, 2003). Similarly, a significant number of people engage in unpaid volunteer work and research shows this to have positive effects on their mental health (Thoits & Hewitt, 2001). Given the significance that employment holds in the lives of most individuals, it is not surprising that research examining employee mental health is on the increase. Two broad frameworks presently dominate the study of the organisational environment on employee mental health and well-being, as outlined below (Harter, Schmidt, & Keyes, 2003).

The Stress Perspective to Employee Mental Health emphasizes the assumption that stressful working conditions (stressors) contribute to the experience of a negative psychological response to stress (strain), which leads to poor psychological and physical health, increased illness, and poor performance (Spector & Jex, 1998). From this perspective, mental health typically means the absence of strain, boredom, or burnout (Harter et al., 2003), as well as the absence of mental illness. This approach has, until recently, been at the core of most research into employee health and well-being.

The Positive Approach to Employee Mental Health stems from the potential behavioural, emotional, and physical benefits of positive feelings and cognitions. Supporters of this

perspective argue that positive emotional states and experiences enhance performance and quality of life. Mental health includes the presence of positive emotions and experiences, and should result in happier and better performing employees. Until recently, less attention has been devoted to the positive framework of employee mental health. This means that less interest had been paid to positive factors (e.g., positive emotions, cognitions, and employee strengths), or approaches (e.g., appreciative inquiry, positive organisational behavior and positive organisational scholarship) that underlie employee behaviour.

The extent to which the stress perspective has dominated workplace research is now well documented (see Luthans, 2002a, 2002b), and the need for a more balanced approach that includes both positive and negative components is becoming increasingly evident. Both perspectives, used together, will provide practitioners and researchers with a more comprehensive framework from which to guide research and develop interventions aimed at enhancing employee mental health.

The advent of positive psychology (PP) has seen an increase in the number of studies on the positive side of employee mental health. Inspired by Martin Seligman and Mihaly Csikszentmihalyi (Seligman & Csikszentmihalyi, 2000), the PP movement has altered the direction of academic research in an attempt to rectify the negative bias of traditional psychology, so that a more complete picture of human nature can emerge. Thus, in contrast to the vast majority of prior research, PP has shifted the focus of inquiry from human weakness and illness, to the study of human strengths, human potential, and the factors about human nature that work (Compton, 2005; Seligman & Csikszentmihalyi, 2000; Seligman et al., 2005). Although these areas of inquiry existed before the PP movement emerged, PP has provided a forum for like-minded researchers to collaborate with one another and has also provided an umbrella term for the positive study of human nature (Sheldon & Ryan, 2007).

The PP movement has thus provided a framework for scholars to examine positive human characteristics with enhanced direction and precision.

More recent disciplines that align with the PP movement have provided a more targeted and focused inquiry for the study of positive phenomena within the context of organisations. Positive Organisational Scholarship (POS) is the study of positive outcomes, processes, and attributes of organisations and their members (Cameron, Dutton, & Quinn, 2003a; 2003b). By drawing from the full spectrum of organisational theories to understand, explain and predict positivity in the workplace, POS provides organisational scholars with a unique, positive approach in which to enhance workplace outcomes and improve organisational effectiveness. Similarly, Positive Organisational Behaviour (POB) is the study and application of positive human strengths and psychological phenomena that can be measured, developed, and managed to improve workplace performance (Luthans, 2002a, 2002b), and is essentially the application of PP principles to the workplace.

Both POS and POB have generated additional and useful insight into positive approaches that can be used to enhance employee mental health and workplace performance. Despite this increase in positive research, however, there is still a continued need for investigation into the positive aspects of mental health, particularly in a workplace context. Continued research will help to minimise the negative research bias and will likely uncover new and unique ways to improve employee health. Due to the substantial focus in the literature on the stress and strain approach, I will adopt a predominantly positive lens to employee mental health in this dissertation. Hence, I will focus on factors which underlie employee well-being. There are several important reasons as to why research into employee well-being is important. First, employee well-being cuts across many areas of industrial-organisational psychology and is very relevant to organisational concerns such as performance, organisational behaviour, leadership, and workplace morale. Hart and Cooper's (2001)

Organisational Health Framework—which includes both positive and negative aspects of employee mental health—supports the importance of employee well-being for the financial and operational performance of organisations via a complex interaction between individual and organisational level variables. Thus, employee well-being at the individual level can affect performance at the organisational level, and therefore holds importance for the ‘bottom-line’ (Cotton & Hart, 2003; Hart & Cooper, 2001). Studies have shown, for example, that job satisfaction among employees predicts enhanced discretionary effort that, in turn, predicts enhanced customer satisfaction (e.g., Hart et al., 2002). Second, work experiences affect broader mental health outcomes. Research has revealed, for example, a moderate relationship between job satisfaction and life satisfaction (Judge & Watanabe, 1993; Rode, 2004; Rice et al., 1980). Similarly, Kelloway and Barling (1991) showed that work factors can have a direct impact on broader mental health outcomes, which they referred to as context free mental health. This lends support to an interdependence between work and non-work domains, which, together, affect one’s mental health and happiness. Hence, there is an important ethical obligation to ensure that employees are both healthy and happy at work, and an important objective of this dissertation is to gain more knowledge to assist with this goal.

Employee well-being is defined here as the presence of wellness and optimal functioning rather than the absence of negative states such as stress, strain, burnout, or mental illness. Mental wellness incorporates a variety of factors that reflect what is good about life. Those who are mentally healthy are said to be ‘flourishing’ (Keyes, 2007), which is to exhibit high levels of hedonic and eudaimonic well-being. Hedonic well-being aligns with the construct of subjective well-being (SWB; Diener et al., 1999; Diener, 2000), which is essentially the scientific term for ‘happiness’ (Page & Vella-Brodrick, 2009). It consists of two core

components: an emotional component, of high positive affect and low negative affect, and a cognitive component, involving judgments about one's overall life satisfaction.

This contrasts with eudaimonic well-being, which is focused on positive psychological functioning. It is now recognised that although individuals need to experience pleasurable states and happiness, they also need to feel that their life and behaviour is meaningful (Ryan & Deci, 2001). This is the essence of the eudaimonic approach to well-being, which aligns with the construct of psychological well-being (PWB; Ryff, 1989). PWB has been described as “engaging with the existential challenges of life” (Keyes, Schmotkin, & Ryff, 2002, p. 1007), and is thus based more around behaviour and functioning than is SWB. PWB is best represented by Ryff's (1989) six dimensions of positive functioning, which include positive relations with others, self-acceptance, purpose in life, autonomy, environmental mastery, and personal growth.

Research suggests that although SWB and PWB are highly related, they make up two distinct components of a higher order well-being construct (Biaobin, Xue, & Lin, 2004; Keyes et al., 2002; Linley et al., 2009). Both well-being constructs, together, represent the total construct of employee well-being and provide a more complete picture of what it truly means to be psychologically healthy. Hence, both components of well-being will be included in the operationalisation of well-being throughout this dissertation.

At the individual level, research attests to the importance of well-being in the workplace. Using Keyes' (2002, 2007) flourishing model—which includes hedonic and eudaimonic components in order to be categorised as ‘flourishing’ (Keyes, 2007)—employees who fail to reach a flourishing state do not function as well at work, neither physically nor emotionally. For example, Keyes' research suggests that, compared to individuals who exhibit neither well-being nor mental illness and hence are categorised as languishing, flourishing adults miss fewer workdays and are involved in fewer cutbacks at work (Keyes, 2002, 2005b).

They also exhibit higher psychosocial functioning (Keyes, 2002, 2003, 2005b) and have fewer chronic diseases or conditions (Keyes, 2004, 2005a). In fact, there are now several studies that support the association between well-being, or other positive states with enhanced physical health (Salovey et al., 2000; Scheier & Carver, 1987, 1992; Veenhoven, 2008).

From an organisational perspective, employee well-being holds an important commercial interest. There is evidence to suggest, for example, that employee well-being is associated with increased performance and discretionary effort in organisations. The happy-productive worker research has suggested that happy employees tend to perform at a higher level than unhappy employees (e.g., Wright & Cropanzano, 1997; Wright & Staw, 1999). It also appears that happy employees are more helpful to other people than their unhappy counterparts (Isen, 1970; Kasser & Ryan, 1996); they are more empathetic and respectful and actively engage in organisational citizenship behaviours and extra-role activities that benefit the companies for which they work (Avey et al., 2008; George, 1991, 1998; Miles et al., 2002; Rego, Ribeiro, & Cunha, 2010; Williams & Shiaw, 1999). There is also evidence to suggest that indices of higher well-being are associated with lower intention to turnover and actual turnover (Griffeth, Hom, & Gaertner, 2000). Given the substantial costs involved with the process of recruiting replacements for departed employees (see Cascio, 2003), as well as efforts to address underperforming employees, it seems that interventions to increase employee well-being hold important commercial value for organisations.

There is also conceptual evidence for the benefits of improving employee well-being. A workplace where employees are high in PWB and SWB will increase the frequency and intensity of the experience of positive emotion at work. This, in turn, may increase individual and organisational performance through a phenomenon known as an ‘upward spiral effect’.

The upward spiral effect is best explained by Barbara Fredrickson's Broaden and Build Theory (Fredrickson, 1998, 2001, 2003a, 2003b; Fredrickson & Cohn, 2008). The Broaden and Build Theory posits that positive emotions encourage individuals to engage with their environment and participate in a variety of activities that benefit the individual and further the species (Fredrickson, 2001). Positive emotions are claimed to broaden one's momentary awareness and encourage new, diverse, and exploratory thoughts and actions. This broadened range of thoughts and actions—referred to as a 'thought-action repertoire'—builds one's enduring personal resources and skills. The emotional experience of *interest*, for example, creates the desire to explore and absorb novel information. These processes will, in turn, likely develop one's knowledge and understanding of his or her world. In contrast, negative emotions narrow attention and cognition, and thus trigger limited, immediate survival-oriented behaviours that are needed to contend with a direct threat or problem (Cohn et al., 2009). Hence, enhancing the experience of positive emotions for employees will likely have other commercially valuable consequences for organisations.

Perhaps the most promising evidence for the benefits of employee well-being is presented by Lyubomirsky, King, and Diener (2005) in their meta-analysis of the relationship between happiness and success across multiple life domains including work performance, income, health, friendship, and marriage. Counter to the prevalent assumption that success *causes* happiness, not the other way around, they examined the cross-sectional, longitudinal, and experimental evidence to test an alternative model that posits a reverse causal direction – that happiness *causes* success. Their analyses supported the temporal sequence predicted by the model. Specifically, cross-sectional studies showed positive associations between happiness and successful outcomes in all the major life domains such as work, health, and relationships. It also revealed several positive relationships between happiness and desirable

attributes and behaviours such as sociability, prosocial behaviour, likability, creativity, and positive perceptions of the self and others. The longitudinal literature revealed that long-term happiness precedes the successful outcomes with which it correlates. Similarly, long-term happiness and positive affect were found to precede the desirable attributes and behaviours with which they are correlated. Finally, experimental studies offered strong evidence that short-term positive affect causes a range of behaviours that reflect success such as positive perceptions of self and others, sociability, prosocial behaviour, creativity, and problem solving. Moreover, positive affect may indeed be the critical mediator between happiness and culturally valued success outcomes. Thus, the evidence supports Lyubomirsky et al.'s (2005) conceptual model that happiness causes the successful outcomes with which it is consistently found to be correlated.

Problem Statement

There is currently a substantial body of research on the correlates of well-being. For example, well-being has been shown to correlate with demographic variables such as age, gender, marital status, race, and education (Andrews & Withey, 1976; Argyle, 1999), and personality and attitudes (Diener & Lucas, 1999; Diener et al., 1999). Notable relationships in the field of organisational behaviour are increased performance and retention, as discussed previously. Much of this work, however, has focused on the SWB component of well-being, and significantly less attention has been paid to PWB. Even more importantly, less interest has been devoted to ways to enhance well-being in the workplace.

Part of this neglect has stemmed from the considerable scientific skepticism over whether it is actually possible to achieve sustainable increases in well-being. Sheldon and Lyubomirsky (2006) identified two important sources of this skepticism. First is the notion of a set-point for well-being (Lykken, 1999; Lykken & Tellegen, 1996). Set-Point Theory

suggests that within each individual is a genetically pre-determined set-point, from which the experience of well-being can deviate due to major life events, but any deviation is transitory and well-being will eventually return to its previous 'set-point'. Some authors have suggested that the heritability of well-being may range from as high as 80% to near 100% (e.g., Lykken, 2000; Lykken & Tellegen, 1996), although 50% is the more widely accepted figure (Sheldon & Lyubomirsky, 2006). The second source of skepticism is due to the notion of hedonic adaptation (Frederick & Loewenstein, 1999), which suggests that humans quickly adapt to circumstances that increase or decrease their well-being, and the effect of these circumstances on their well-being subsequently diminishes or disappears entirely.

There is now a wide body of discordant evidence against both hedonic adaptation and set point theory (see Heady, 2008; Lyubomirsky, Sheldon, & Schkade, 2005). For example, in a negative sense it appears that some life events are so traumatic that victims subsequently fail to recover to their previous set-point. The death of a child or spouse (e.g., Lehman, Wortman, & Williams, 1987), repeated and sustained periods of unemployment (Clark et al., 2004), and disability (Mehnert et al., 1990) have, for example, been shown to have an enduring negative effect on various indicators of well-being. Contrastingly, and more in line with the PP movement, other scholars have found that various factors can lead to sustained increases in well-being. Sin and Lyubomirsky's (2009) meta-analysis, for example, showed that PP interventions produced significant increases in well-being ($r = .29$) and significant decreases in depressive symptoms ($r = .31$). This study provides empirical evidence to suggest the hedonic set-point is not the sole determinant of well-being, but instead, it is more likely determined by a range of factors, including individual behaviour.

Lyubomirsky et al. (2005) proposed a three component model, which they referred to as the 'architecture of sustainable change', and suggested a person's SWB is governed by three important factors: a genetically determined set point for happiness, one's life circumstances,

and, importantly, one's intentional activities. In this model, the set-point accounts for 50% of the variance in SWB, life circumstances account for 10%, while the intentional activity accounts for 40% of SWB (see Lyubomirsky et al., 2005; and Sheldon & Lyubomirsky, 2007 for a review of the evidence for each component). It is the latter component, intentional activity, which holds the most promise in altering levels of well-being, presumably because one can exert effort to change and control their behaviour. Thus, the model suggests that individuals have direct control over 40% of their well-being through the adoption of positive, well-being enhancing behaviours.

There are now several studies which support the 'architecture of sustainable change' and the notion that happiness can be enhanced through altering our intentional activity (Seligman et al., 2005; Sheldon & Lyubomirsky, 2006; Sin & Lyubomirsky, 2009). Such findings suggest that enhancing well-being is not a futile endeavour, as it was previously suggested to be while governed by the concepts of a set-point and hedonic adaptation.

Given the positive benefits that PP interventions have had in enhancing individual wellness (e.g., Sin & Lyubomirsky, 1999; Seligman et al., 2005), it makes sense to further this research by shifting the focus onto the workplace. A workplace perspective will add to the literature by potentially unearthing additional and unique activities upon which interventions can be designed to enhance the well-being of employees. In this dissertation, I will explore the relationship between a specific form of intentional activity and well-being. In selecting this intentional activity, it was decided that there were some important criteria to satisfy in order to make a unique and valuable contribution to the literature. First, in order to ensure that an exploration of this activity would make a valuable contribution, it was decided that, while being well-grounded in the PP literature, the activity should be either work specific or could quite easily be adopted in a workplace environment to enhance well-being. This criterion was established because most of the past research on intentional activities and

their relationship to well-being are not specific to the workplace. Second, in order to make a unique contribution to the literature, it was decided that the activity should be relatively unexplored, and thus have few empirical research papers devoted to it. A construct that satisfies both of these criteria is the concept of employee job crafting, and hence, this formed a primary focus for this dissertation.

Job crafting is defined as the ways in which employees take an active role in initiating physical or cognitive changes within the boundaries of their jobs (Wrzesniewski & Dutton, 2001). Three forms of job crafting have been identified. *Task crafting* refers to initiating changes in the number or type of activities one completes on the job. *Relational crafting* involves exercising discretion about whom one interacts with at work. *Cognitive crafting* is distinct from task and relational crafting in that it involves altering how one ‘sees’ their job, with the view to making it more personally meaningful. All three forms of job crafting represent unique ways in which employees initiate physical or cognitive changes to their jobs in order to make them more meaningful and enjoyable, and congruent with their skills, interests, and values. As I will illustrate throughout this dissertation, job crafting embodies a promising new avenue for research into sustainably enhancing employee well-being.

Research Questions

This dissertation addresses two important issues relating to the measurement and correlates of job crafting, respectively: (1) How do researchers empirically measure job crafting, and are job crafting behaviours empirically distinguishable along the three dimensions of task, relational, and cognitive forms of crafting? (2) Does job crafting yield a significant relationship with employee well-being, and if so, what are the theoretical mechanisms that explain this relationship? It is anticipated that these questions will add to the body of knowledge on how to enhance employee well-being in the workplace.

Research Question 1: How do researchers empirically measure job crafting, and are job crafting behaviours empirically distinguishable along the three dimensions of task, relational, and cognitive forms of job crafting? Until recently, there had been no way for empirical research on job crafting to progress due to the nonexistence of a general measure with which the construct could be reliably and validly measured. This means that there has been almost no attempt to establish an empirical association between job crafting and employee well-being. Although some measures have been developed and validated, they are context-specific measures targeted towards specific populations of interest, such as manufacturers (e.g., Ghitulescu, 2006) or teachers (Leana, Appelbaum, & Shevchuk, 2009), and thus not appropriate for use with general working populations. To address this gap, Tims, Bakker, and Derks (2012) recently developed a measure of job crafting which they entitled the Job Crafting Scale (JCS). Although the JCS was deemed appropriate for the general working population, there were two important reasons why this scale was not used in the present dissertation. First, due to the JCS being published only very recently, it was not available until after the present studies had been conceptualised and implemented, and thus could not form a part of any of the present data sets. Second, the JCS was aligned very closely with the Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2007; Demerouti et al., 2000, 2001), and hence, is not consistent with the original conceptualisation of job crafting of Wrzesniewski and Dutton (2001) that includes the three dimensions of task, relational, and cognitive crafting. A scale that aligns with this theoretical framework will provide a useful addition to the literature.

The first empirical study is therefore focused on the development and validation of a new job crafting scale that is both aimed at the general working population and consistent with the original job crafting theory conceptualised by Wrzesniewski and Dutton (2001). This

measure is entitled the Job Crafting Questionnaire (JCQ), and it is expected that it will empirically distinguish the three dimensions of task, relational, and cognitive crafting, which will sit independently and robustly on three separate factors. The development and validation of a reliable and valid measure of job crafting will provide researchers with an alternative tool to progress empirical research into this promising construct. Hence, the JCQ and the JCS offer differing approaches to job crafting research that may be complementary and could therefore contribute different but equally important information about job crafting activities at work and how they relate to individual and work outcomes. Moreover, the JCQ will allow researchers to empirically explore the relationship between the three components of job crafting and employee well-being – an area that has, to date, not received any research attention. Hence, this gap in the literature will form the second major question of this dissertation.

Research Question 2: Does job crafting yield a significant relationship with employee well-being, and if so, what are the theoretical mechanisms that explain this relationship?

Although the set-point and hedonic adaptation research suggests that one's well-being cannot be changed, there are studies that suggest the opposite, which is that well-being *can* be increased (as outlined earlier). Therefore, in the second empirical study in this dissertation, I will test a model of employee well-being that includes job crafting as its central antecedent. The model includes job crafting as the central antecedent due to its roots in employee behaviour, which, naturally, is much more malleable to change than personality or dispositional characteristics, as well as environmental or job characteristics. Hence, it holds promise for improving employee well-being because it is under the direct control of employees and can be implemented with little conscious discretionary effort.

It is also important to uncover the mechanisms by which these behaviours might lead to increased well-being. An underpinning that might explain these relationships is Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2000), which posits that individuals have three inherent needs. These are the needs for autonomy, competence, and relatedness. *Autonomy* requires the experience of choice and being the initiator of one's own behaviour. *Competence* requires succeeding at challenging tasks and ultimately attaining desired outcomes. *Relatedness* requires a sense of caring, mutual respect, and mutual reliance with others. These needs specify the necessary psychological nutrients for ongoing psychological growth, health, and well-being, and their satisfaction is hypothesised to be associated with optimal functioning, an ongoing sense of growth, and integrity (Ryan & Deci, 2000).

A large body of research now shows that these needs, when satisfied, lead to important outcomes such as intrinsic motivation and well-being (Deci et al., 2001; Reis et al., 2000; Sheldon & Elliot, 1999; Sheldon, Ryan, & Reis, 1996). However, no studies have yet investigated the relationship between job crafting and need satisfaction despite the fact that, conceptually, the two constructs closely align. For example, a central premise of job crafting is that individuals who craft their job do so to maintain control over their work (task crafting), to create a positive self-image for themselves in their work (cognitive crafting), and to connect with others in the workplace (relational crafting) (Wrzesniewski & Dutton, 2001). These three motivations to engage in job crafting align with the three needs for autonomy, competence, and relatedness, respectively. Hence, the model in the second empirical investigation in this dissertation examines whether job crafting predicts the satisfaction of the three SDT needs, which, in turn, predicts enhanced employee well-being. Well-being will include assessments of both SWB and PWB in a broader employee well-being model. Should

the model be supported, researchers and practitioners will have strong empirical grounds for the development of job crafting interventions aimed at enhancing employee well-being.

Thesis Structure

The structure of this thesis is as follows: chapter two provides the reader with a detailed theoretical review paper that has been submitted for publication. It presents an overview of SDT and its relationship with important workplace outcomes, including well-being. SDT is the central underpinning for this thesis and it was therefore necessary to provide an overview to set the context for the upcoming studies. The paper will focus on the importance of satisfying the needs for autonomy, competence, and relatedness at work and specifically addresses the well-established relationship between need satisfaction and well-being. It will also provide a detailed overview of the antecedents to need satisfaction, and will argue that employee needs are governed by three independent sets of antecedents: behavioural, personality/dispositional, and contextual antecedents. Along with other workplace behaviours, job crafting sits within the behavioural antecedents to need satisfaction and embodies an unexplored yet promising way in which employees could satisfy their needs, and hence enhance their well-being.

Chapter three links the theoretical review with the first empirical study. It focuses on the need for a new scale with which to measure job crafting, and also provides the reader with some additional methodological considerations regarding this study. Specifically, it addresses some technical concerns about using both exploratory and confirmatory factor analytic methods for scale development. Chapter four comprises the first empirical paper that has been submitted for publication. This paper presents the results of the development and validation of the Job Crafting Questionnaire (JCQ). The final validated JCQ can be found in Appendix A.

Chapter five links the first empirical paper with the second empirical paper, the latter of which is focused on testing an empirical model. The linking chapter is therefore intended to enhance understanding of structural equation modeling (SEM) methods, with a specific focus on exploring the issues and assumptions of SEM in the context of the present data set. Chapter six comprises the second empirical paper that has been submitted for publication. The paper involves a study which tests a structural model examining whether job crafting predicts psychological need satisfaction, which, in turn, predicts employee well-being. Chapter seven is the final chapter and consists of the overall discussion that addresses what the thesis adds to the body of literature. Given each study has its own discussion, the final chapter will provide a brief overall discussion of the findings, as well as provide avenues for future research and a conclusion.

This thesis aims to 1) add to the literature a new, theoretically derived scale that can be used to progress job crafting research; 2) generate further insight into the concept of job crafting by exploring empirically the relationships between job crafting activities and employee well-being; and 3) explore the theoretical mechanisms that underlie these relationships. Findings from this thesis will 1) provide researchers with a new measure they can use to progress job crafting research; and 2) provide some of the first empirical inquiries into job crafting and its associations with important individual outcomes.

This thesis is presented in line with the Monash University guidelines as a “thesis by publication”, and, as such, the chapters within may consist of a published paper, a paper in press, or a paper under review. Therefore, due to the nature of the format of this thesis and the established guidelines of Monash University there will be some unavoidable repetition throughout the chapters. This is primarily because the same concepts, definitions, and arguments are presented separately in each paper and again addressed in the final discussion.

2. Chapter Two – Research Paper 1 Declaration

Positive Psychology and The Workplace: The Business Case for Psychological Need Satisfaction and Employee Well-Being

Monash University

Declaration for Thesis Chapter 2

Declaration by candidate

In the case of Chapter Two, the nature and extent of my contribution to the work was the following:

Name	Nature of Contribution	Extent of contribution (%)
Mr Gavin Robert Slemph	Primary Author	75%

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of Contribution	Extent of contribution (%) for student co-authors only
Dr Dianne A. Vella-Brodrick	Secondary Author	25%

Candidate's Signature	Date

Declaration by all co-authors

The undersigned hereby certify that:

- 1) The above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors;
- 2) They meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;

- 3) They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
- 4) There are no other authors of the publication according to these criteria;
- 5) Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor of the publisher of journals or other publications, and c) the head of the responsible academic unit; and
- 6) The original data are stored at the following locations(s) and will be held for at least five years from the date indicated below:

Location(s)

School of Psychology and Psychiatry, Monash University Caulfield Campus

Signature 1	Date
Signature 2	Date

2.0 CHAPTER 2

PAPER 1

POSITIVE PSYCHOLOGY AND THE WORKPLACE: THE BUSINESS CASE FOR PSYCHOLOGICAL NEED SATISFACTION AND EMPLOYEE WELL-BEING

Under review at *Applied Research in Quality of Life*

Abstract

The aim of this paper is to review some key factors that underlie employee well-being. First, Self-Determination Theory (SDT) is reviewed and offered as a useful underpinning for explaining employee well-being at work. Second, it is argued that in accordance with SDT, employee well-being is achieved when one's basic needs for autonomy, competence, and relatedness are satisfied. Finally, based on empirical research, the factors that lead to the satisfaction of these needs are then identified. It is proposed that the satisfaction of one's needs is achieved through a combination of (a) behavioural determinants such as strengths use, goal pursuits, and job crafting; (b) contextual determinants such as autonomy support; and (c) dispositional determinants such as personality and self-efficacy. A conceptual model is then proposed along these three sets of determinants that may aid scholars to align their inquiry and interventions on those factors that hold the most promise for enhancing employee well-being.

Keywords: Self-Determination Theory, Autonomy, Competence, Relatedness, Well-being, Need satisfaction.

Positive psychology and the workplace: The business case for psychological need satisfaction and employee well-being

Interest in what makes people happy has been a theme of inquiry for centuries. From Aristotle's treatises on ethical virtues to the more recent inquiries of Maslow and Rogers, there has always been interest in increasing human wellness and maximising human potential. Only recently, however—through the positive psychology movement—has this interest manifested in the workplace, where practitioners and researchers are looking for methods to improve not only employee functioning and performance, but also their well-being, engagement, and general quality of life. There is now a growing literature on positive health approaches for employees, and several theories offer a sound framework from which to develop strategies aimed at enhancing employee well-being. One important theory on which to guide interventions to enhance employee well-being is Self-Determination Theory (SDT; Deci & Ryan, 2000; Deci & Ryan, 2008a, 2008b; Ryan & Deci, 2008).

SDT posits the existence of three innate psychological needs that, when satisfied, lead to optimal functioning, increased performance, and well-being. They are the needs for autonomy, competence, and relatedness. *Autonomy* requires the experience of choice and being the initiator of one's own behaviour. *Competence* requires succeeding at tasks and ultimately attaining desired outcomes. *Relatedness* requires a sense of caring, mutual respect, and mutual reliance with others. There is now quite a substantial body of research on these three needs that shows promising results for professionals working in both clinical and non-clinical fields (discussed shortly). Nonetheless, presently the body of research serves primarily an academic interest and there are few papers on *how* the needs can be used to promote optimal functioning and well-being in applied settings such as the workplace.

Moreover, the Industrial-Organizational psychology literature has, at present, not paid a great deal of attention to SDT (Gagné & Bhawe, 2011). It is thus the aim of this paper to address this gap by presenting a business case for employee need fulfilment, and by reviewing the evidence on factors underlying employee autonomy, competence, and relatedness. Such insight enables us to appreciate their effects on the psychological experience of well-being and how this, in turn, affects the workplace.

Thus, the factors that give rise to autonomy, competence, and relatedness at work are reviewed with a particular emphasis on those factors that are well-grounded in the positive psychology literature. This review is guided by those initiatives that are either work specific or those which can quite naturally form a part of employee work behaviour and can thus be undertaken with little discretionary effort. A business case for initiatives that help satisfy autonomy, competence, and relatedness in the workplace is also presented, and it is argued that such initiatives will lead to sustainably enhanced employee well-being. Employee well-being is defined here as consisting of subjective happiness as well as positive functioning. Therefore well-being is viewed as a comprehensive construct consisting of emotional and cognitive components (i.e., positive emotions and life satisfaction, known as subjective well-being; SWB) as well as consisting of a behavioural component (i.e., positive human functioning, known as psychological well-being; PWB).

Self Determination Theory and Well-Being in Humans

SDT is a general theory of human motivation based on the premise that individuals inherently desire to grow and develop toward their maximum potential (Deci & Ryan, 2000). In contrast to many theories that focus on the quantity and strength of motivation, SDT makes a quality distinction. Initially, this distinction identified extrinsic motivation (i.e., completing tasks to satisfy external demands or for external rewards), and intrinsic motivation (e.g.,

completing tasks due to the inherent interest and enjoyment it brings) (Meyer & Maltin, 2010). Further refinements identified several types of extrinsic motivation, which lie on a continuum (Deci & Ryan, 2000). On the left of the continuum is *external regulation*, which is essentially behaviour controlled by external contingencies such as tangible rewards or avoiding punishment; the next type is *introjection*, where individuals internalise the external contingencies sought in external regulation; this is followed by *identification*, the process through which people recognise the value of the external contingencies and accept them as their own; the final form of extrinsic motivation is *integration*, which is the fullest and most complete form of internalisation, and involves integrating the external regulations as a part of one's values and identity. On the far right of the continuum is *intrinsic motivation*, which is the basis for autonomous and self-determined behaviour. Those who are intrinsically motivated are more apt to reach their maximum potential and optimise their mental health. Several studies across diverse cultures and samples have empirically supported this continuum of autonomous motivation and its relationship to behaviour (Deci & Ryan, 2000; Ryan & Connell, 1989; Ryan & Deci, 2000; Vallerand, 1997). This research shows that optimal functioning and well-being are evident when behaviour is motivated by those reasons toward the right pole of the continuum (i.e., integrated or intrinsically motivated behaviours).

SDT also posits that the degree to which individuals are able to maximize their potential depends on the satisfaction of the psychological needs to feel autonomous, competent, and related to others. These needs specify the necessary psychological nutriment for ongoing psychological growth, health, and well-being, and their satisfaction is associated with optimal functioning, an ongoing sense of growth, and integrity (Ryan & Deci, 2000). A further claim of SDT is that each need holds unique significance in optimal development. Therefore, none

of the proposed needs can be thwarted or neglected without significant negative consequences (Deci & Ryan, 2000).

An important assumption of SDT is that the three basic psychological needs are universal, and therefore should be satisfied in all cultures and contexts for people to remain healthy and function optimally. This assumption is made because it is expected that intrinsic goals are more congruent with an individual's core desires, interests, and values; ultimately resulting in greater internalisation, learning, and self-determination. The achievement of intrinsic goals thus provides a true source of personal meaning, satisfaction, and growth. This assumption was supported by cross-cultural research showing that intrinsic goals, such as learning, personal growth, and relatedness, enable greater satisfaction of the SDT needs than do extrinsic goals, such as fame, wealth, status, or appearance. Research has also revealed that a stronger emphasis placed on intrinsic goals relative to extrinsic goals is positively related to well-being. These results are consistent across US and Russian samples (e.g., Ryan et al., 1999) and US and German samples (e.g., Schmuck, Kasser, & Ryan, 2000). Moreover, research has replicated the association between need satisfaction and well-being in Nigeria and India (Sheldon, Abad, & Omoile, 2009), China (Vansteenkiste, Lens, Soenens, & Luyckx, 2006) and South Korea (Sheldon, Elliot, Kim, & Kasser, 2001). This association has also been supported across different contexts including the workplace (Deci et al., 2001), education (Reis et al., 2000; Sheldon, Ryan & Reis, 1996) and sports (Gagné, Ryan, & Bargmann, 2003).

The finding that the SDT needs framework is robust across cultures and contexts indicates that these are inherent human needs that are likely to have a genetic or evolutionary basis. Further evidence supports this premise (e.g., Sheldon & Gunz, 2009) but is beyond the scope of this paper. Taken together, this research suggests that the three needs are important

for people of all cultures and ethnicities, across the globe. Given the trend of globalisation and the consequent increasing cultural diversity of workforces, it is promising that this needs framework can be applied across cultures and contexts as a means to enhance employee well-being.

The business case for psychological need satisfaction: The link with employee well-being

As stated, SDT posits that need satisfaction is important for optimal functioning and development, and an ongoing sense of integrity. In support of this premise, research (presented shortly) has provided strong empirical evidence for the association between need satisfaction and well-being, and a failure to satisfy the needs with ill-being. The following discussion will first explore the relationship between each individual need and important individual and workplace outcomes. Research that has investigated the relationship between all three needs simultaneously with various well-being indicators will also be reviewed. However, it is important to address some important gaps in the literature at the outset. First, most of this research has utilised correlational analyses, which restrains the ability to infer causality. Second, this research is limited by its predominant focus on employee job satisfaction rather than more explicit and comprehensive measures of well-being, when it is now argued that job satisfaction does not provide a complete assessment of employee mental health (Page & Vella-Brodrick, 2009). Nonetheless, the following discussion provides useful evidence of the positive benefits for satisfying the SDT needs in work settings.

Autonomy at Work

According to SDT, autonomy refers to volition (Deci & Ryan, 2000). It is the desire to organise behaviour and life experiences so that they are concordant with one's intrinsic sense of self. In the workplace, this refers to an employee's experience of choice and control in initiating work tasks, and even the desire to organise work behaviour to be concordant with

one's broader values and interests. Highly autonomous jobs allow incumbents to determine the ordering, pacing, procedure, and scheduling of tasks, as well as the coordination of tasks with other employees, teams, or organisations. There is now a wealth of research on autonomy and its relationship to several important workplace outcomes, including various indices of well-being. In a comprehensive meta-analysis, Spector (1986) examined the results of 88 studies on the relationship between perceived control variables (which they defined as either autonomy or participative decision making, or both) and several employee outcomes. It was found that a high level of perceived control was positively related to job satisfaction, commitment, involvement, performance, and motivation. Similarly, perceived control was inversely related to emotional distress, role stress, absenteeism, intent to turnover, actual turnover, and physical symptoms. Although perceived control is not entirely synonymous with workplace autonomy (they included some studies that only examined the isolated construct of participative decision making in their meta-analysis), it is similar enough to suggest that employee autonomy is an important need, that, when satisfied, leads to important workplace outcomes. Indeed participative decision making would constitute a form of workplace autonomy that would unlikely form a significant part of the roles for those employees with little to no freedom to approach tasks as they see fit.

Other meta-analyses have supported these findings. Blegen (1993) meta-analysed the findings from 48 nursing samples, involving 15,048 participants. Autonomy was one of seven variables that were moderately related to job satisfaction ($\rho = .42$). In a more recent meta-analysis, Zangaro and Soeken (2007) found that autonomy was moderately related to nurses' job satisfaction ($\rho = .30$). Even more recent studies have supported these findings (e.g., Miller, Mire, & Kim, 2009), suggesting that the relationship between autonomy and job satisfaction is at least moderate. Moreover, if these studies measured the more complete

construct of employee well-being that includes indices of SWB as well as PWB—rather than focusing exclusively on the cognitive component of job satisfaction—it is likely that these relationships would be higher, as together, these variables cover a greater breadth of variance in mental health outcomes.

Competence at Work

SDT defines competence as a form of environmental mastery – the propensity to have an effect on the environment and attain valued outcomes within it (Deci & Ryan, 2000). In the workplace, this refers to a perceived mastery of the workplace and work tasks, succeeding in the face of challenge and attaining desired work outcomes. Several studies have explored the relationship between perceived competence and organisational outcomes, particularly job satisfaction. The general consensus of this literature is that competence is positively related to job satisfaction. It is worth noting, however, that most of this research has not examined competence as defined by SDT. Rather, research has tended to explore constructs that are conceptually similar to competence such as job control, self-efficacy, or interventions aimed at enhancing the experience of competence such as training and staff development.

Some research has explored the relationship between employees' sense of competence and important employee states such as job satisfaction and global self-esteem. Tharenou and Harker (1982) found significant positive correlations between competence and job satisfaction, as well as general employee self-esteem. This suggests that employees who feel competent are more likely to enjoy their work and are more likely to have higher self-esteem at work and outside of work. Similar research has examined the relationships between concepts conceptually similar to competence, such as employee self-efficacy – which refers to a belief in one's competence (Bandura, 1977). For example, Stajkovic and Luthans (1998) conducted a meta-analysis on 114 studies and 21,616 participants examining the relationship

between self-efficacy and work-related performance. Results indicated a significant weighted average correlation ($\rho = .38$). This suggests that psychological competence is a good predictor of employee performance.

Other research has obtained similar findings between self-efficacy and other important psychological outcome variables. Several studies, for example, have shown that self-efficacy and job satisfaction are positively related (e.g., Moè, Pazzaglia, & Ronconi, 2010; Song & Chathoth, 2010; Wang Lawler, & Shi, 2010) indicating that employees who have belief in their ability are more likely to be satisfied with their work and their job. Other research shows the benefits of employee competence through less direct associations. Research has found relationships between job satisfaction and increased competence through training interventions. Babakus et al. (1996) found that training was positively associated with perceived organisational support ($r = .29$), intrinsic motivation ($r = .14$), and job satisfaction ($r = .26$). Other studies have found that staff development opportunities, which would presumably increase staff skill sets and thus aid their satisfaction of competence (Cross & Wyman, 2006; Gardulf et al., 2005), predict job satisfaction and turnover.

The examination of the effect of broader organisational development (OD) programs on employee job satisfaction provides further support for the positive benefits of employee perceived competence. Generally, OD programs can be broadly categorised into one of three types of interventions: human process interventions, techno-structural interventions, and multifaceted interventions (Neuman, Edwards, & Raju, 1989). Human process interventions are designed to improve human functioning, processes, and fulfilment, and generally focus on tasks such as goal setting, participation in decision making, team building, training, and feedback. Techno-structural interventions are designed to enhance the work environment, work method, and work relationships, and generally focus on factors such as job design, job

enrichment, or flexi-time. Multifaceted interventions use a combination of one or more human processes and/or techno-structural interventions. In their meta-analysis on the effects of three types of OD programs on employee attitudes, Neuman et al. (1989) found that team building and lab training, two specific types of human process interventions, exhibited the greatest influence on job satisfaction. This is not surprising given the focus of human process interventions is to modify employee behaviour rather than the environment. Hence, it is likely that human process interventions have a greater impact on one's perceived ability to complete their role, which likely produced a corresponding influence on employee job satisfaction.

Relatedness at Work

SDT defines relatedness as the desire to be connected to others, to love and care and to feel loved and cared for (Deci & Ryan, 2000). In the workplace, this refers to a feeling of mutual respect, caring, and a mutual reliance on others (Deci et al., 2001). Although the extent to which work-specific relatedness affects job satisfaction and employee well-being is not well researched in the industrial-organisational literature, the few studies on it are in the expected direction. That is, employees with greater numbers of friends and high quality friendships at work are more likely to be satisfied with their job. Although this research offers a useful starting point, further research needs to explore these associations with more comprehensive measures of employee well-being that contain both indices of SWB and PWB.

The literature differentiates between friendship *quantity* and *quality*. Research on the former has shown that friendship opportunities in the workplace are associated with increased job satisfaction, job involvement, and organisational commitment (Morrison, 2009; Riordan & Griffeth, 1995). These results are likely because greater opportunity for friendships at

work puts employees in a better position to make friends and thus satisfy their need for relatedness. Opportunities for relationships at work are also associated with lower turnover (e.g., Gow, Clark, & Dossett, 1974; Mossholder, Settoon, & Henagan, 2005). Feeley, Hwang, and Barnett (2008) found fast food restaurant employees who reported more links with friends were less likely to leave. This study also found that friendship quantity is significantly more important than the closeness of friends. This latter finding, however, is easily explained by a part-time work environment where flexibility, different hours, and shift swapping are common and important employee concerns. Moreover, the sample size in this study was small ($N = 44$), and thus needs to be replicated on a larger, more representative sample.

Studies examining friendship *quality* have produced similarly expected results. Winstead et al. (1995) found that the quality of one's best friendship in the workplace is predictive of job satisfaction, whereas those friendships that were considered 'high maintenance' were inversely related to job satisfaction. This is not surprising given the importance of relatedness for a sense of mutual caring and security. Findings suggests that those employees with high quality friendships are likely to derive greater benefits from those relationships and are thus in a better position to fulfill their inherent need for relatedness, which, in turn, increases their job satisfaction and reduces their intent to leave the organisation. Gallup research (Harter, Schmidt, & Hayes, 2002; Harter, Schmidt, & Keyes, 2003) has supported these findings by concluding that having "a best friend at work" is an important component of employee engagement, which predicts important workplace outcomes including job satisfaction, turnover, and performance. In a comprehensive meta-analysis on 36 organisations and 198,514 employees, Harter, Schmidt, and Hayes (2002) found that engagement is related to enhanced business unit performance on customer satisfaction,

productivity, profit, turnover, and days or time lost due to safety incidents. However, they measured whether people had a best friend at work in a single item in a composite measure of engagement. This makes it difficult to isolate the specific influence of a best friend at work on these outcomes.

Need satisfaction and Well-Being: Integrated Research

A growing body of research based exclusively on SDT also strongly supports the association between need satisfaction and individual well-being, although a lot of this research has not focused on workplace settings. A common method used to test these relationships is to use a daily activity-based methodology. This method explores whether the needs of autonomy, competence, and relatedness accompany various daily activities, and whether these experiences explain daily fluctuations in well-being. Sheldon, Ryan, and Reis (1996) used this method to examine whether daily fluctuations in autonomy and competence were related to well-being. Their results revealed that the experience of autonomy and competence in daily activities ‘made for a good day’, in that these experiences were positively related to vitality and positive affect, and negatively related to symptomatology and negative affect. Reis et al. (2000) conducted similar research but extended their investigation to include relatedness. Hierarchical linear modelling indicated that trait measures of autonomy, competence, and relatedness, as well as aggregate measures of the three daily traits were related to well-being, including vitality and positive affect. Although autonomy and competence were inversely related to symptomatology and negative affect, relatedness did not predict these negative outcomes. Sheldon and Elliot (1999) recorded similar findings with longitudinal data. These authors showed that goal self-concordance—which are goals consistent with one’s inherent interests, values, and desires—led to increased

effort and attainment of goals. Moreover, their research indicated that self-concordant goals also led to need satisfaction, which, in turn, led to SWB.

Other research has examined the association between need satisfaction and well-being in specific contexts, most notably in sporting contexts. The general consensus of this literature is that need satisfaction is positively related to indices of well-being in athletes (e.g., Gagné, Ryan, & Bargmann, 2003; Reinboth & Duda, 2006; Reinboth, Duda, & Ntoumanis, 2004; Wilson et al., 2003). Importantly, evidence also exists to suggest an association between need satisfaction and well-being in work settings. Research indicates, for example, that employee reports of need satisfaction are related to self-esteem, job satisfaction, and psychological health (Ilardi et al., 1993). Notably, these findings have emerged even after controlling for the extrinsic factors of salary and job status. Studies have also revealed that need satisfaction predicts performance, motivation, and psychological adjustment at work (Deci et al., 2001). Although these studies provide strong evidence of the association between need satisfaction and well-being, they were conducted using a cross-sectional methodology and heavily relied on self-reports. This makes it impossible to establish causality and difficult to rule out the potential artifacts of shared method variance.

Until recently, there had been no causal evidence that need satisfaction leads to as well-being, performance, or motivation. To address this gap, Sheldon and Filak (2008) experimentally manipulated all three needs in a $2 \times 2 \times 2$ between participants factorial design with a sample of 196 introductory psychology students. They found that manipulated competence support and relatedness support had main effects on most outcomes, including: intrinsic motivation, positive and negative mood, and objective task performance. Moreover, ratings of autonomy, competence, and relatedness all predicted these outcome variables. These findings provided important causal evidence as to the importance of the SDT needs for

well-being, performance, and motivation. Although, it is noteworthy that this study did not measure the full construct of well-being, but rather focused on measures of positive and negative mood.

Taken together, there is strong empirical evidence to support the existence of the three needs and their relationship with important workplace outcomes including job satisfaction, well-being, engagement and motivation. Although most of the literature has used cross-sectional designs, the studies that have used longitudinal or experimental methods have also supported these findings. Hence, workplaces that introduce systems to aid the satisfaction of the SDT needs in its employees—perhaps through various environmental or behavioural interventions—will likely have a more satisfied, happier and higher performing staff.

The ‘how’ of psychological need satisfaction

The literature indicates that psychological need satisfaction is positively associated with employee mental health. Thus, it offers a useful framework from which to build employee interventions aimed at enhancing employee well-being. However, this important objective requires knowledge of the ‘how’ of need satisfaction. Although there has been less scientific inquiry into this area, there is now a small but growing body of research on the methods by which one can fulfill their basic psychological needs. This offers a useful starting point from which to base employee well-being interventions.

In opposition to the *set-point* and *hedonic adaptation* concepts, which both suggest that well-being cannot be sustainably increased due to genetic determinism and the natural tendency of humans to adapt to circumstances that increase or decrease their well-being, respectively – Lyubomirsky, Sheldon, and Schkade (2005) proposed a three component model of well-being named the ‘architecture of sustainable change’. The model asserts that

well-being is influenced by three essential determinants: a well-being set-point, life circumstances, and intentional activities. The set-point component refers to the personality/genetic influences that are resistant to change or intervention. The life circumstances component refers to the incidental but relatively stable facts of one's life, and may include demographic factors or life events. The intentional activity component refers to the daily activities and thoughts which are under the volition of individuals. According to Lyubomirsky et al. (2005), the latter is the most promising means of influencing happiness as behaviour is under the direct control of individuals and hence is malleable to change. Lyubomirsky and colleagues have argued that the three components account for 50%, 10%, and 40% of the variance in well-being respectively (Lyubomirsky, Sheldon, & Schkade, 2005; Sheldon & Lyubomirsky, 2004, 2007).

It is possible and indeed likely that one's psychological needs are governed by three similar sets of determinants: dispositional/genetic determinants, contextual determinants, and behavioural determinants. Dispositional determinants are the enduring individual characteristics that are resistant to change but are important for well-being; they include dispositions such as personality or self-efficacy. Contextual determinants are the environmental characteristics that either enhance or impede employee needs through circumstances over which employees have little control. For example, there is evidence to suggest that the behaviour of one's direct manager influences employees' ability to satisfy their needs, which, in turn, influences their performance and well-being (Deci et al., 2001). Behavioural determinants refer to specific employee activities, behaviours, or cognitions that are able to affect their need satisfaction. Again, it is this category that holds the most promise for sustainably increasing employee well-being because it is these activities, behaviours, and cognitions which can be controlled.

This paper draws on three behavioural determinants that are likely to affect need satisfaction: 1) goal pursuits—the extent to which one’s goal pursuits are self-concordant and thus consistent with one’s intrinsic desires and values, 2) Strengths use—that is, one’s natural tendency to play to their strengths and use their strengths at work, and 3) job crafting—one’s ability to make subtle task, relational, or cognitive changes to their work so that it becomes more personally meaningful and enjoyable (Wrzesniewski & Dutton, 2001). It is likely that these behavioural determinants affect the experience of work by influencing cognitions and behaviours so that they align with one’s intrinsic desires, beliefs, and values. Thus, they foster a greater sense of authenticity over work behaviours because they become consistent with the needs of each individual.

Although there has been a substantial amount of empirical research on the relationship between goal pursuits and need satisfaction, there has been comparatively less on the relationships between both strengths use and job crafting with need satisfaction. Thus, the arguments for these relationships are largely conceptual and need to be confirmed empirically. This is especially the case with job crafting, which, to date, has no theory about how it actually influences work outcomes. Indeed a fruitful avenue for future research would be to explore the range of different activities or behaviours in which employees could engage to fulfill their basic needs. This would help to address the gap on *how* to fulfill the needs from a behavioural perspective, and ultimately, help to uncover unique and creative methods by which employee well-being can be enhanced.

Behavioural determinants and psychological need satisfaction

Goal pursuits and attainment. A substantial body of evidence exists to support the relationship between goal pursuits and important individual and work outcomes. Sheldon and Kasser (1995) introduced the concept of organismic congruence to suggest that the *content* (the ‘what’) and the *reasons* (the ‘why’) of goal pursuits are important for well-being. The content of goals concerns the extent to which they are intrinsically or extrinsically motivated. Intrinsically motivated goals involve the pursuit of self-actualisation, personal growth, and integration. Self-acceptance, community involvement, and affiliation, for example, are intrinsic goals. In contrast, extrinsically motivated goals involve the pursuit of external recognition and rewards, and are typically regarded as a means to an end. Goals such as financial success, social recognition, good looks, and fame are extrinsic goals. Factor analyses have supported this theoretical distinction, showing that intrinsic and extrinsic goals load on two separate factors (e.g., Kasser & Ryan, 1996). Moreover, the intrinsic and extrinsic goal distinction has been empirically supported across 15 cultures, with the two goal types lying at opposing ends of a circumplex continuum (Grouzet et al., 2005).

Several studies have shown that goal content is related to well-being. Specifically, the attainment of intrinsic goals is related to enhanced well-being (e.g., Kasser & Ryan, 1996, Schmuck, Kasser, & Ryan, 2000; Sheldon & Kasser, 1998). In other words, people who value goals directed at personal growth, learning, affiliation, or community involvement tend to have higher well-being, including self-actualisation, self-esteem, and vitality. In contrast, extrinsic goals such as wealth, attractiveness, popularity, and fame are associated with higher levels of ill-being such as depression, anxiety, narcissism, psychosomatic symptoms, and lower well-being (Kasser & Ryan, 1993, 1996; Sheldon & Kasser, 1995; Sheldon, Ryan, Deci, & Kasser, 2004). Although intrinsic goals tend to be autonomously motivated and

extrinsic goals tend to be pursued for externally regulated or controlled reasons, the autonomy of goals can be considered independently of its intrinsic or extrinsic content (Ryan, Huta, & Deci, 2008). For example, one could become involved in the community (a presumably intrinsic goal), but do so due to external pressures or the desire to be perceived positively by others (an extrinsic goal). Hence, the *reason* for goal pursuits—the extent to which goals are autonomously motivated or concordant with one’s interests and values—is also important. Studies have shown that both the content and the reasons of goals provide independent contributions to well-being (e.g., Carver & Baird, 1998; Sheldon, Ryan, Deci, & Kasser, 2004; Vansteenkiste, Lens, & Deci, 2006). Specifically, research indicates two positive benefits from the pursuit of autonomous relative to controlled goals. First, autonomous goals elicit higher levels of effort and are therefore more likely to be attained than are controlled goals (Sheldon & Elliot, 1998, 1999). Second, the attainment of autonomous goals is related to SWB and positive psychological adjustment (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon, Ryan, Deci, & Kasser, 2004).

Both the content and reasons for goal pursuits is likely related to well-being because the extent to which goals are intrinsic/extrinsic or autonomous/controlled allows for variable levels of need satisfaction. Intrinsic goals allow greater need satisfaction as they are consistent with a desire for self-actualisation, growth, and optimal functioning. Similarly, autonomous or self-concordant goals allow for greater need satisfaction because they are consistent with one’s inherent desires, interests, and values; hence allowing for a greater enjoyment, learning, and potential growth.

Importantly, further research has shown that the goal attainment to well-being process is mediated by need satisfaction. Sheldon and Elliot (1999), for example, supported this process with three independent studies. Their first study showed that those in pursuit of self-

concordant goals invested more sustained effort into those goals and hence were more likely to achieve them. Their second study examined the longitudinal relationship between daily need satisfying experiences and well-being in 152 students over the course of a semester. They found that the accumulation of daily need satisfying experiences over time predicted well-being. Their third study replicated study one, and also tested a model whereby need satisfaction was the mediator between goal self-concordance and enhanced well-being. This model was supported in a sample of 73 students. These results indicate that need satisfaction is the mechanism by which goal self-concordance leads to enhanced well-being. Thus, to reap greater need satisfaction and, in turn, well-being – one’s goals should be intrinsic and autonomous, rather than extrinsic or controlled.

Strengths use. Coinciding with the advent of positive psychology, there has been a growing interest in the area of human strengths in recent years. Human strengths—defined as “the things that we are good at and that give us energy when we are using them” (Linley, 2009, p. 2) —have been shown to be associated with both SWB and PWB, even when controlling for the effects of dispositional factors such as self-efficacy and self-esteem (Govindji & Linley, 2007). The majority of the research on strengths has focused on the “why” of strengths by examining the relationships between strengths and important outcomes such as well-being and engagement (Clifton & Harter, 2003; Peterson et al., 2007) and work performance (Clifton & Harter, 2003). This information is important for coaching psychologists, coaches, therapists, consultants, and other practitioners who are traditionally interested in the positive results of strengths use (Lyons & Linley, 2008). However, it does not explain the “how” of strengths use. Hence, the mechanisms by which strengths use leads to well-being remained until recently, unknown, and a solid theory of the processes of how strengths use leads to well-being outcomes is still lacking.

One way strengths use may lead to well-being is through the satisfaction of the SDT needs. Linley et al., (2010) suggested that strengths use serves to satisfy autonomy, competence, and relatedness because it is largely intrinsically motivated. Using one's core strengths conveys a sense of ownership and authenticity over their behaviour, an intrinsic desire to engage in such behaviour, and a feeling of inevitability in doing so. Strengths use is thus considered to be concordant with one's intrinsic values and interests. Linley et al. (2010) supported this process in a sample of 240 university students. These authors tested a repeated measures cross-sectional model which found using one's signature strengths led to goal progress, which, in turn, led to need satisfaction and enhanced well-being. These results suggest that need satisfaction is at least a partial mechanism by which strengths use leads to enhanced well-being. A useful avenue for future investigation would be to conduct similar research on working populations to determine whether strengths use at work leads to need satisfaction at work, and ultimately general and work-related well-being.

Job crafting. SDT can provide some conceptual insight into other interesting concepts under investigation by organisational scholars (Sheldon et al., 2003). For example, Wrzesniewski and Dutton (2001) introduced the concept of job crafting, which they suggested would lead to important work outcomes. These authors defined job crafting as “the physical and cognitive changes individuals make in the task or relational boundaries of their work” (Wrzesniewski & Dutton, 2001, p. 179). Job crafting, then, is a type of cognitive or behavioural change that allows an individual to attain a deeper level of meaning and satisfaction from their work. Of particular relevance to SDT, a central premise of job crafting is that individuals who craft their job do so to maintain control over their work, to create a positive self-image for themselves in their work, and to connect with others in the workplace (Wrzesniewski & Dutton, 2001). These motivations to engage in job crafting align closely

with the three SDT needs for autonomy, competence, and relatedness, respectively. Although no published studies have explicitly tested whether job crafting is empirically related to the SDT needs—nor has any study tested whether job crafting is related to employee well-being—it is likely that job crafting would contribute to an employee’s ability to satisfy these three needs. For example, it makes sense that employees who actively seek opportunities to change their work tasks to suit their skills or interests, who seek opportunities to view their job in a way that is more personally meaningful, and who seek to connect with others at work, would derive greater psychological need satisfaction and, in turn, enhance their work satisfaction and well-being.

Although there is a dearth of quantitative research on job crafting, recently there have been some attempts to assess the extent to which it is related to job outcomes. Leana, Appelbaum, and Shevchuk (2009), for example, investigated the relationship between some forms of job crafting, at both the individual and group level, with performance, job satisfaction, commitment, and turnover intentions across employees (i.e., teachers and childcare workers) in 62 childcare centres. These authors found that job crafting at the group level—which they referred to as “collaborative crafting”—was significantly related to performance, particularly for less experienced teachers, as well as job satisfaction and commitment. Job crafting at the individual and group level was positively related with workplace autonomy, which the authors referred to as perceived discretion. Similarly, Tims, Bakker, and Derks (2012; Petrou et al., 2012) found that self reported job crafting was significantly related to work engagement, employability, and performance, and negatively related with employee cynicism. Job crafting thus represents a promising construct that requires further scientific inquiry to develop a theory about how it affects work outcomes, as well as to generate insight into the relationship between job crafting and employee well-being

– an area in which the literature has been relatively silent. Such information would provide practitioners and coaches with a malleable concept that they can target in interventions to potentially enhance employee work satisfaction and well-being. Indeed some scholars have already offered Self-Determination Theory as an underpinning for effective coaching practice (e.g., Spence & Oades, 2011) and a further focus on job crafting may ultimately assist with this approach.

Contextual determinants and psychological need satisfaction

Autonomy support. There are various contextual factors present in the workplace which may either support or thwart the satisfaction of employee needs. These might include factors such as climate, work design, or autonomy support. Autonomy support is perhaps the most potent contextual determinant for predicting employee identification and integration, and therefore autonomous behaviour (Gagné & Deci, 2005). In work contexts, it is generally recognised as a supervisor's understanding and acknowledgement of employee perspectives. It requires that supervisors provide meaningful information, offer opportunities for choice and independence, and encourage self-initiation (Deci & Ryan, 1985). While autonomy supportive environments have positive outcomes for employees, environments where individuals perceive others as controlling of their behaviour have been shown to have a negative effect on self-motivation, persistence, and well-being (Chirkov & Ryan, 2001; Deci & Ryan, 2000; Pelletier et al., 2001). These results are consistent with an important premise of SDT: environments that thwart need satisfaction are likely to result in poor functioning and ill-being, whereas environments that facilitate need satisfaction are likely to result in optimal functioning and well-being.

Most studies on autonomy support have been conducted in non-work contexts. For example, research has shown benefits of autonomy supportive environments in healthcare

(e.g., Williams et al., 2002), family (e.g., Chirkov & Ryan, 2001; Soenens & Vansteenkiste, 2005), education (e.g., Black & Deci, 2000; Soenens & Vansteenkiste, 2005), and in sport and exercise contexts. Much of the research on the latter has explored the influence of coaches' interpersonal style on athlete motivation and well-being (Amorose & Anderson-Butcher, 2007; Conroy & Coatsworth, 2007; Gagné, Ryan, & Bargmann, 2003; Gillet et al., 2010; Pelletier et al., 2001). Results from these studies have indicated that coaches' controlling behaviour weakens athlete motivation and well-being, whereas coaches' autonomy supportive behaviour increases motivation and well-being. Some of these studies also reveal that need satisfaction is the mechanism by which autonomy support leads to increased motivation and well-being (Gagné, Ryan, & Bargmann, 2003; Reinboth, Duda, & Ntoumanis, 2004). This suggests that autonomy supportive coaches create an environment that enables need satisfaction, which, in turn, leads to enhanced well-being in athletes.

In work contexts, research on autonomy support gained momentum in the 1980s when several studies found it predicted important work outcomes, including general satisfaction, trust in the organisation, as well as perceptions of authentic management (e.g., Deci, Connell, & Ryan, 1989; Pajak & Glickman, 1989). However, these earlier studies did not consider the mediating role of need satisfaction. Subsequent research confirmed that need satisfaction is the mediating factor (e.g., Baard et al., 2004; Deci et al., 2001). Hence, research indicates that autonomy supportive work climates predict the satisfaction of all three basic needs, which, in turn, predicts these important work outcomes, as well as well-being. Sports research has also supported the mediating role of need satisfaction between autonomy support and athlete well-being (e.g., Gagné, Ryan, & Bargmann, 2003; Reinboth, Duda, & Ntoumanis, 2004).

Interventions to change the psychological experience of work should consider the potential interaction of autonomy support and the behavioural determinants of goal-pursuits,

strengths use, and job crafting. It is likely, for example, that managerial autonomy support would affect employees' ability to change their behaviour at work such that it more closely aligns with need satisfying experiences. Hence, autonomy support potentially impinges on employees' ability to use their strengths, craft their jobs, and to set intrinsic and autonomous goals at work and, for this reason, may offer researchers a way to generate further insight into ways to enhance wellbeing by examining the interaction between these constructs.

Dispositional determinants and need satisfaction

Dispositional factors are regarded as one of the strongest predictors of SWB (Diener et al., 1999; Lyubomirsky, Sheldon, & Schkade, 2005; Sheldon & Lyubomirsky, 2007). This may be due to the possibility that individual difference factors such as personality and temperament influence peoples' feelings and evaluations of their lives. It may also be because emotions are an inherent part of personality (Lucas & Diener, 2008) and behaviour.

Several personality traits have been associated with SWB. Most research, however, has focused primarily on extraversion and neuroticism, as these variables tend to explain the most variance (Diener, Oishi, & Lucas, 2003). Research generally shows that extraversion is moderately correlated with positive affect, whereas neuroticism is strongly correlated with negative affect (Diener & Lucas, 1999). DeNeve and Cooper (1998) meta-analysed 148 studies with a total of 42,171 participants that examined the extent to which personality constructs were correlated with SWB. When personality traits were grouped according to the big five, neuroticism was the strongest predictor of SWB ($\rho = -.22$), followed by conscientiousness ($\rho = .21$), agreeableness ($\rho = .17$), extraversion ($\rho = .17$), and openness ($\rho = .11$). Importantly, when the variability between the various personality scales are controlled for, these relationships become much higher and can explain as much as 39% to 63% of the variance in SWB (Steel, Schmidt, & Schultz, 2008).

It is possible that dispositional factors lead to increased well-being as they influence an individual's natural behaviours and cognitions in a way that enables them to satisfy their psychological needs. For example, a common observation of extraverts is that they tend to be more sociable than introverts (Argyle & Lu, 1990; Wolfe & Kasmer, 1988). This disposition could aid the satisfaction of relatedness, which, in turn, may enhance well-being. In support of this view, research shows that extraversion is associated with well-being (Judge, Hellier, & Mount, 2002; Steel, Schmidt, & Schultz, 2008) and that these associations are at least partially explained by an extravert's propensity to have more social connections and enhanced relationships (Argyle & Lu, 1990; Cheng & Furnham, 2002, 2003; Lee, Dean, & Jung, 2008). Similarly, employees high in self-efficacy would be in a better position to satisfy their need for competence. Not only does research show that self-efficacy is related to various indices of well-being (Magaletta & Oliver, 1999; Monje & Almagia, 2008), but various workplace characteristics that support self-efficacy correspondingly have an effect on well-being (e.g., Nielsen & Munir, 2009) and job satisfaction (Nielsen et al., 2009). Although self-efficacy is not synonymous with competence as defined by SDT, it makes sense that individuals high in self-efficacy and who thus hold beliefs that they will succeed in various situations, are much more likely to feel competent in their activities, which, in turn, affects their experiences of job satisfaction and well-being.

Proposed Model

Figure 1 shows the proposed model illustrating the antecedents and consequences of psychological need satisfaction. As discussed, there is strong evidence to suggest that the antecedents to need satisfaction consist of three broad groups: behavioural determinants, contextual determinants, and personality/dispositional determinants. All three categories are predicted to have strong associations with need satisfaction, which in turn leads to well-being

and work performance. In line with the definition of well-being provided earlier, it is proposed that need satisfaction leads to PWB and SWB; though few studies test the relationships with such a comprehensive model of well-being. Instead, most of the research has either focused on isolated components such as SWB, or job satisfaction.

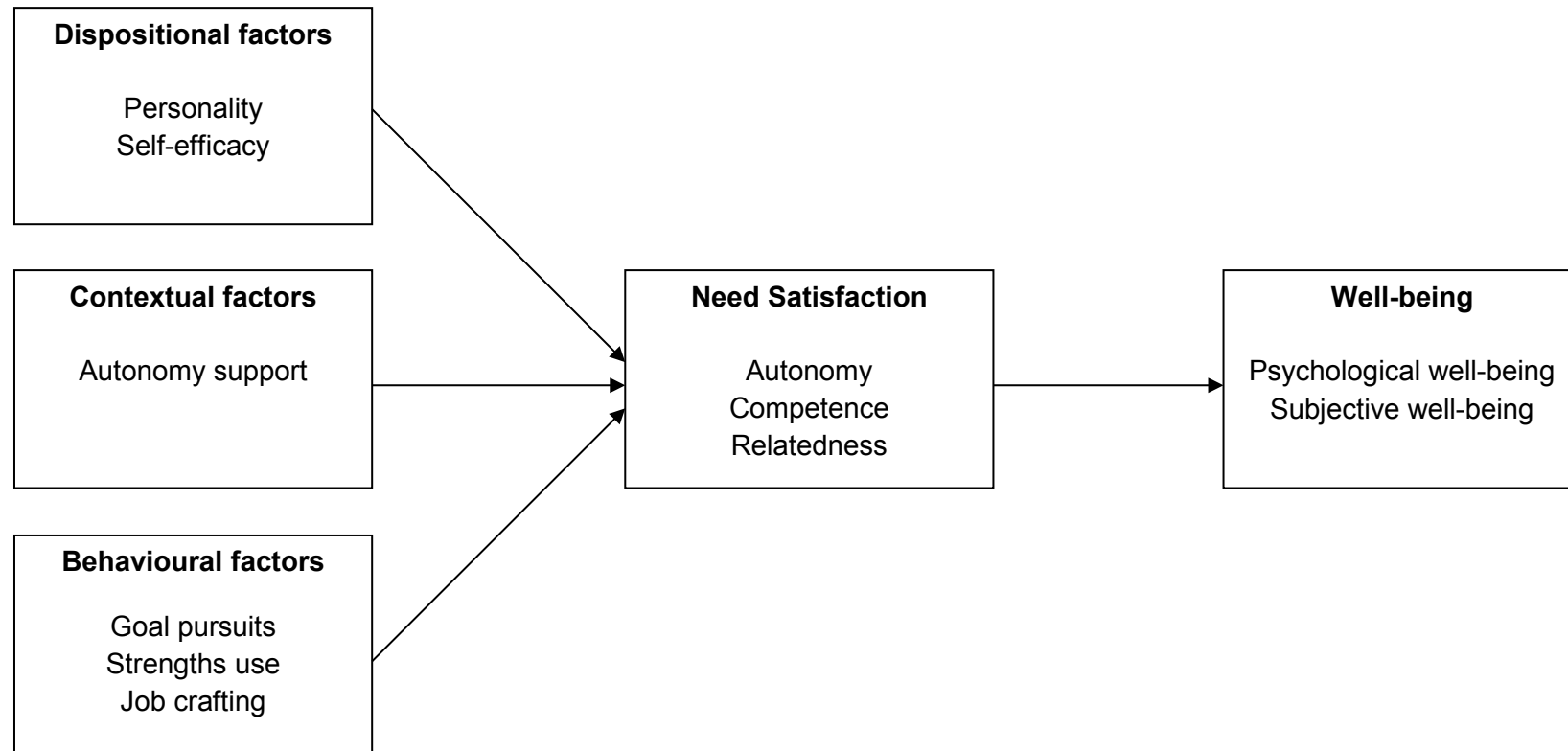


Figure 1. The proposed model of antecedents and consequences of psychological need satisfaction

Concluding remarks

This review provided a business case for psychological need satisfaction and the ways in which employee needs can be fulfilled. The consensus of the research suggests that fulfilling employee needs for autonomy, relatedness, and competence is strongly related with higher well-being and performance. Figure 1 illustrates the variables on which interventions could be designed to enhance employee well-being. Although most interventions would primarily focus on those concepts that are more malleable—the behavioural determinants—interventions that consider the interactions between the different antecedent variables may be more effective. The extent to which employees experience autonomy support at work likely influence their opportunities to engage in need satisfying experiences. A more comprehensive intervention would thus aim to address determinants at the contextual level and at the level of individual behaviour in order to enhance employee well-being. In a workplace setting, for example, this may involve ensuring managers are autonomy supportive of subordinates' strengths use, job crafting, or ability to set intrinsic and autonomous goals at work. Given their higher degree of malleability to change, behavioural determinants provide the most promising avenue for influencing employee well-being and performance. Other noteworthy considerations are that they are easily delivered through interventions and easily implemented in the workplace by staff. The research provides solid evidence for the association between both goal-setting and strengths use with well-being. Although the relationship between job crafting with well-being is not as well researched, it is highly likely that individuals who make subtle changes to the way they complete their job in order to make it more enjoyable and meaningful will derive more satisfaction and enjoyment from their work, which will have a corresponding effect on employee well-being.

Work accounts for a significant portion of one's conscious life. Hence, the experience of work invariably influences the overall health and quality of life of working adults. Spillover theory (Staines, 1980; Zedeck, 1992), which posits that satisfaction in one domain of life varies as a function of the level of satisfaction in another, provides support for this assertion. There is evidence, for example, for a reciprocal relationship between job satisfaction and life satisfaction (Judge & Watanabe, 1993; Lambert, 1990; Rain et al., 1991; Sirgy et al., 2001), which suggests that experiences at work affect broader life outcomes, and vice-versa. By making the experience of work more positive for employees, organisations will not only be enhancing employee job satisfaction and happiness at work, but will also enhance their employees' broader mental health and quality of life. Engaging in these workplace behaviours will help employees to align their work tasks and cognitions with need satisfying experiences, which, in turn, will likely enhance employee well-being.

Future research should further explore the range of behaviours that could fall under the behavioural determinants category. This will provide practitioners with a more complete range of positive activities upon which they can base their workplace interventions, potentially providing useful pathways to sustainably increasing employee well-being.

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3.0 CHAPTER 3

THE NEED FOR A JOB CRAFTING SCALE AND BEST PRACTICE IN SCALE VALIDATION

The Need for a New Job Crafting Scale and Best Practice in Scale Validation

As outlined in Paper One, there is a body of research on intrinsic goal setting and its association with need satisfaction and, in turn, well-being (e.g., Kasser & Ryan, 1996, Schmuck, Kasser, & Ryan, 2000; Sheldon & Elliot, 1998, 1999; Sheldon et al., 2004; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 1998). It was, therefore, decided that this would not form a part of the empirical investigations in this thesis, as there is less scope for a unique contribution to the literature. The research on the relationships between strengths use, need satisfaction, and well-being, however, is far less substantial. Nonetheless, there still exists evidence to suggest that need satisfaction is the mechanism by which strengths use leads to well-being (Linley et al., 2010). Moreover, this research suggests that participants who use their strengths do so to achieve their goals, which ultimately enables enhanced goal progress, need satisfaction, and ultimately well-being.

In contrast, there are at present few studies that have empirically investigated job crafting and its effects on work outcomes. Hence, there has been a dearth of research that has examined the relationships between job crafting activities, self-determination, and well-being in employees. This is surprising given the positive individual benefits that would likely arise from altering work experiences to suit one's needs, interests, and values, and its close conceptual alignment with the three needs for autonomy, competence, and relatedness. It is for this reason that this dissertation will focus primarily on job crafting and its relationship to employee well-being. It is anticipated that, similar to strengths use and intrinsic goal setting, job crafting will exhibit positive relationships with employee well-being.

A likely reason for the dearth of empirical research into job crafting has been the lack of a suitable measure, as only recently has a generic job crafting measure been published (e.g., Tims, Bakker, & Derks, 2012). Earlier measures of the construct have not been suitable for

general research into organisational behaviour as these measures were developed for highly specific populations of interest, such as teachers (e.g., Leana, Appelbaum, & Shevchuk, 2009) or manufacturers (e.g., Ghitulescu, 2006). The recent Job Crafting Scale (JCS; Tims et al., 2012) is suitable for use with the general adult working population and is based on the Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2000, 2001). However, even though this scale provides a valuable method by which job crafting can be measured, it is not consistent with the original job crafting model that was conceptualised by Wrzesniewski and Dutton (2001), and a scale that aligns with this original job crafting model would provide a useful contribution to the literature.

Wrzesniewski and Dutton's (2001) conceptualisation of job crafting consists of three unique and distinct components: task crafting, relational crafting, and cognitive crafting (described earlier). Most of the qualitative or theoretical research has been conducted using this tri-dimensional model of job crafting (e.g., Berg, Wrzesniewski, & Dutton, 2010; Leana, Appelbaum, & Shevchuk, 2009; Lyons, 2008; Ghitulescu, 2006) and it is important for empirical explorations of the construct to continue along a consistent path to the original and accepted conceptualisations of job crafting. Moreover, it is important to explore the cognitive dimension of the construct, which is lacking in Tims et al.'s (2012) JCS (discussed in more detail in Submitted Paper Two). An exploration of the cognitive component of job crafting is necessary because this will enable the full range of antecedents and consequences to be uncovered for each dimension of job crafting. It will also allow researchers to determine which facets have the strongest relationships with important employee outcomes, such as psychological need satisfaction and employee well-being.

Although the JCS is a rigorously constructed scale that offers a valid tool by which job crafting can be measured, it was also not available at the time the present studies were conceptualised and designed. Hence, for this reason as well as the identified limitations of the instrument outlined earlier, a decision was made to develop and validate a new general scale of job crafting—The Job Crafting Questionnaire (JCQ)—which could be used for future psychological research. The JCQ would remain as consistent as possible to the original and accepted conceptualisation of job crafting that was offered by Wrzesniewski and Dutton (2001) that consists of the task, relational, and cognitive crafting dimensions. This validation paper forms the fourth chapter of this dissertation, and it was the first empirical study conducted. The JCQ validated in this paper was subsequently utilised for chapter six of this dissertation, the aim of which was to examine if an empirical association between job crafting, need satisfaction, and employee well-being existed.

Further empirical examination of job crafting is an important area for future research because it may unearth a new and creative concept upon which employee well-being interventions can be based. A positive association between job crafting, psychological need satisfaction, and well-being will provide preliminary evidence suggesting that job crafting may be another form of intentional activity (Lyubomirsky, Sheldon, & Schkade, 2005) that individuals can employ in order to improve their well-being. Lyubomirsky et al. (2005) have offered several intentional activities in which individuals can engage in order to enhance their well-being. However, few, if any of these activities or interventions are focussed specifically on the workplace and, as such, there exists an important need to uncover some context specific interventions that employees can use to enhance both the pleasure and enjoyment, as well as the personal meaning that they attain from their work. Job crafting is a useful concept

that fulfils these requirements by offering a work-specific and behaviourally based activity that employees could use to enhance their well-being.

Scale Validation Method

Although there remains some debate about the best way to validate a scale, the literature has identified some general points of agreement. Some of these points, particularly those regarding the use of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were summarised and clarified by Worthington and Whittaker (2006) in their systematic review of the last 10 years of research in the field of scale development in counselling psychology. Where possible these recommendations were adhered to during the process of validating the JCQ. The recommendations most central to the procedure followed in this dissertation are outlined as follows.

Have the items reviewed prior to submitting them to EFA. Items that are worded poorly or are not clearly articulated are potential sources of error variance, and will ultimately reduce the strength of the correlations among the items in the scale, diminishing the overall quality of the scale. A separate sample of 27 participants was therefore recruited in order to review the pool of items prior to giving them to participants and subsequently submitting them to EFA methods. Having the item pool reviewed by this separate, preliminary sample helped to ensure that the JCQ items were clear, concise, distinct, legible and reflected the construct of interest – job crafting and its dimensions.

EFA should precede CFA. Byrne (2010) stated that the application of CFA to measurement instruments in the initial stages of development represents a serious misuse of this analytical strategy. Moreover, the use of CFA in isolation provides little to no more information than EFA in isolation (Gerbing & Hamilton, 1996). Thus, rather than use a CFA

that would need to be followed by an additional CFA, the use of EFA followed by CFA is the most logical approach that allows the researcher to determine a workable factor structure that acceptably fits the data. This factor structure can subsequently be tested using confirmatory procedures, which are factor verification techniques and hence more suited to the later stages of scale development.

Determine sample characteristics. Minimum sample sizes should be pre-established prior to data collection. In the case of EFA, a generally accepted rule of thumb is that samples greater than $N = 300$ are good (Comrey, 1973; Comrey & Lee, 1992). However, there is agreement that samples smaller than this can produce reliable results and are thus acceptable in many cases (Worthington & Whittaker, 2006). An accepted minimum is to have at least a 3:1 participant-to-item ratio, or no fewer than 100 participants in total (Reise, Waller, & Comrey, 2000; Thompson, 2004). Other scholars have suggested a minimum of a 5:1 participant-to-item ratio (Gorusch, 1983). In samples marginally better than this minimum, strong correlations among the variables and data sets containing some communalities greater than .60 are generally needed in order to produce reliable results (Worthington & Whittaker, 2006). This standard often requires the researcher to set a minimum sample size and to subsequently evaluate the need for additional data collection based on the initial EFA. In the case of validating the JCQ, the recruited sample was well above the minimum participant-to-item ratio of 5:1 set by Gorusch (1983). Moreover, for the present data set many strong correlations among the variables and several communalities were above .60, ensuring the EFA results for the JCQ were reliable.

The statistical theory underlying CFA (a form of structural equation modelling; SEM) is asymptotic, which assumes that large sample sizes are necessary to give stable parameter estimates (Bentler, 1995). There are various recommendations for calculating the sample

sizes in the case of SEM. Kline (2005) recommends a minimum sample of between 100 and 200 participants. Others recommend that there should be between five and 10 participants per observed variable (Grimm & Yarnold, 1995) or per parameter to be estimated (Bentler & Chou, 1987). Although the recommendations are mixed, there is a clear relationship between sample size and model complexity, with highly complex models demanding a higher number of participants (Worthington & Whittaker, 2006). Similar to EFA, as a minimum, Worthington and Whittaker do not recommend SEM with sample sizes smaller than 100 participants, and around a 5:1 participant-to-parameter ratio serves as a rigorous guide to produce stable estimates. The CFA in this research was not overly complex, with three latent variables and five indicator variables for each latent variable. Hence the sample of $N = 180$ in this dissertation satisfied the recommendations in the literature.

Additional EFA specific recommendations. Some of the further recommendations summarised by Worthington and Whittaker (2006) for the use of EFA, which were followed in the process of validating the JCQ, were to:

1. Verify the factorability of the correlation matrix via the Bartlett's test of Sphericity, which should be significant. Moreover, the Kaiser-Meyer-Olkin value should exceed .60. These procedures are particularly important in samples that barely exceed the minimum 3:1 participant-to-item ratio.
2. Recognise the difference between principal components analysis (PCA) and factor analysis (FA) extraction methods. For scale development, FA is generally preferred over PCA.
3. It is good practice to use oblique rotation when factors are correlated in the data, even in cases where theory suggests that the factors will be uncorrelated. Oblique rotation should be used in the first run of EFA with each factor solution to establish

empirically whether the factors are correlated. For the JCQ, theory would suggest correlated factors, and thus oblique rotation is the preferred method.

4. Establish which criteria will be used for factor retention and item deletion in advance.

For item deletion, previous literature suggests that problematic items have loadings less than .40 (Gorusch, 1983), and which either load on several factors or on the wrong factor. For factor retention, Catell's (1966) scree test should indicate a clear break after the optimal number of factors for further investigation. Moreover, eigenvalues exceeding one are generally accepted standards for factor retention (Tabachnick & Fidell, 2007).

5. If changes are to be made to the scale items (e.g., item deletion, adding items, altering item content), another EFA should be conducted to determine a simple factor structure (Thurstone, 1947) prior to running a CFA.

Additional CFA specific recommendations. Some of the further recommendations summarised by Worthington and Whittaker (2006) for the use of CFA or SEM were:

1. It is becoming increasingly favoured to test competing models over single model approaches. This allows the researchers to test the theoretical plausibility of the model. In the case of the JCQ, it was tested against a single factor model to test whether engaging in job crafting itself (single factor model) is more salient than engaging in the more specific task, relational, or cognitive forms of crafting (multiple factor model).
2. Modification indices are more appropriate for fine tuning rather than large scale re-specification of misspecified models. Moreover, modifications to the model need to be supported by theoretical or logical justifications, rather than raw empiricism (Byrne, 2010). This means that the process of adding covariances among the error

terms in a model should only be used when there is a sound justification for doing so. For example, longitudinal data might give cause for correlating error terms, particularly data from the same item collected at different time points. Similarly, in some cases the theoretical association between certain pairs of items might be stronger than other pairs of items. In such cases, correlating the error terms is theoretically and/or logically justifiable. In the case of the JCQ, however, there was no strong theoretical or logical rationale for using such a procedure. Hence, it was decided *a priori* that dropping problematic items would be a more effective and justifiable procedure.

Conclusion

The aim of this chapter was to provide a rationale for the subsequent paper in this dissertation, which was focused on the development and validation of the JCQ. It was argued that the JCQ was needed to provide researchers with a new scale to measure job crafting that aligned with the original model conceptualised by Wrzesniewski and Dutton (2001) and hence measured the cognitive aspect of job crafting – typically omitted from previous scales. It was also necessary to provide researchers with a scale that was suitable for use in general working populations, and hence *not* targeted at specific populations of interest. This chapter also sought to address some of the additional empirical recommendations within the literature for both EFA and CFA. This will help provide a context for the next study and clarify methodological issues, as well as ways in which the data were treated in the analysis stage. Although these procedures were not addressed in the submitted paper, they provided further useful and additional evidence for the rigour to which the JCQ was subjected during its development and validation.

2. Chapter Four – Research Paper 2 Declaration

The Job Crafting Questionnaire: The Development And Validation Of A New Scale

Monash University

Declaration for Thesis Chapter 4

Declaration by candidate

In the case of Chapter Four, the nature and extent of my contribution to the work was the following:

Name	Nature of Contribution	Extent of contribution (%)
Mr Gavin Robert Slemp	Primary Author	75%

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of Contribution	Extent of contribution (%) for student co-authors only
Dr Dianne A. Vella-Brodrick	Secondary Author	25%

Candidate's Signature	Date

Declaration by all co-authors

The undersigned hereby certify that:

- 1) The above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors;
- 2) They meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;

- 3) They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
- 4) There are no other authors of the publication according to these criteria;
- 5) Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor of the publisher of journals or other publications, and c) the head of the responsible academic unit; and
- 6) The original data are stored at the following locations(s) and will be held for at least five years from the date indicated below:

Location(s)

School of Psychology and Psychiatry, Monash University Caulfield Campus

Signature 1	Date
Signature 2	Date

4.0 CHAPTER 4

PAPER 2

THE JOB CRAFTING QUESTIONNAIRE: THE DEVELOPMENT AND VALIDATION OF A NEW SCALE

Under review at *International Journal of Wellbeing*

Abstract

Empirical research on employee job crafting is scarce, probably because until recently, scales with which the construct can be reliably and validly measured were not available. Although a general scale has recently been developed, the cognitive component of job crafting was omitted. The aim of the present study was to address this gap by developing and validating the 15-item Job Crafting Questionnaire (JCQ). The sample consisted of 334 employees who completed a battery of questionnaires, including the JCQ. Exploratory and confirmatory factor analyses both supported a three factor structure that reflected the task, relational, and cognitive forms of job crafting originally presented by Wrzesniewski and Dutton (2001). Convergent analyses showed the JCQ to correlate positively with indices of proactive behaviour (i.e., organisational citizenship behaviour, strengths use, and self-concordant goal setting), and positive work functioning (i.e., job satisfaction, work contentment, work enthusiasm, and positive affect). Discriminant analyses showed the measure to correlate inversely with negative affect. Reliability analyses indicated the measure has high internal consistency. Together, the analyses supported the reliability and validity of the JCQ as a measure to progress job crafting research.

Keywords: Job crafting, task crafting, relational crafting, cognitive crafting, scale development, well-being.

The Job Crafting Questionnaire: A New Scale to Measure the Extent to which Employees Engage in Job Crafting

Practitioners are frequently briefed with the task of enhancing employee satisfaction, well-being, and performance. Although some interventions have successfully improved contextual or job characteristics (Kluger & DeNisi, 1996; Parker, Chmiel, & Wall, 1997; Wall et al., 1986), other efforts have tended to focus on behaviour based change (e.g., Black, 2001; Seligman et al., 2005). A focus on behavioural aspects is promising not only because they can yield important individual outcomes related to well-being, but also because they benefit organisations (e.g., Harter, Schmidt, & Keyes, 2003; Hodges & Clifton, 2004). Job crafting is a promising, yet relatively unexplored behavioural approach which can potentially heighten job satisfaction and well-being (Wrzesniewski & Dutton, 2001).

Job crafting is described as the ways in which employees take an active role in initiating physical, cognitive, or social changes within the boundaries of their jobs. It is an informal process that workers use to shape their work practice so that it aligns with their idiosyncratic interests and values. In this way, job crafting is a form of proactive behaviour, driven by employees rather than management (Grant & Ashford, 2008). In their original conceptualisation of the construct, Wrzesniewski and Dutton (2001) argued for the existence of three forms of job crafting. *Task crafting* refers to initiating changes in the number or type of activities one completes on the job (e.g., introducing new tasks that better suit one's skills or interests). *Relational crafting* involves exercising discretion about whom one interacts with at work (e.g., making friends with people with similar skills or interests). *Cognitive crafting* is distinct from task and relational crafting in that it involves altering how one 'sees'

their job, with the view to make it more personally meaningful (e.g., making an effort to recognise the effect one's work has on the success of the organisation or community). In initiating task, relational, and cognitive changes to one's job boundaries, the meaning of the job and the identity of the employee also change accordingly.

Job crafting shows promise as an effective workplace intervention because it requires employees to adopt an active role in shaping their work experience. It recognises that although employees are typically not able to redesign their jobs, there will be opportunities in the context of almost any job where employees can initiate changes to the tasks, interactions, or ways they think about their work to make it more personally meaningful or enjoyable. Job crafting, then, can be applied across a variety of roles with different levels of seniority and autonomy (Berg, Wrzesniewski, & Dutton, 2010; Wrzesniewski & Dutton, 2001), and hence, it is plausible that even in the most restricted and routinised jobs, employees are able to initiate changes to influence their work experience. The literature also attests to the organisational benefits of employee proactive behaviour. Studies have shown, for example, that proactive employees display greater performance, progress their careers at a faster rate, and are generally paid more (Grant, Parker, & Collins, 2009; Seibert, Kraimer, & Crant, 2001; Thompson, 2005; Van Scotter, Motowild, & Cross, 2000).

Despite job crafting being a promising basis for workplace interventions, it has received surprisingly little research attention. This gap in the literature may stem from the fact that, until recently, few measures of the construct were available. Indeed, with few exceptions, the vast majority of the research on job crafting has been qualitative or theoretical in nature (e.g., Berg, Grant, & Johnson, 2010; Berg, Wrzesniewski, & Dutton, 2010; Fried et al., 2007; Lyons, 2008; Wrzesniewski & Dutton, 2001) and there remains an important need to assess empirically the relationships between job crafting and other employee outcomes.

Previous Efforts to Develop a Job Crafting Measure

Although there have been some efforts to develop job crafting measures, their contexts are generally limited. Ghitulescu (2006) and Leana, Appelbaum, and Shevchuk (2009), for example, developed job crafting measures that were highly specific to their populations of interest – manufacturers and teachers, respectively – and hence contain items specifically targeted towards these two occupation groups. Although rigorously constructed and useful for their respective populations, these scales cannot be used for empirical research with more general working populations. This includes those employees from the regular private or public sectors, whose jobs traditionally involve high levels of autonomy and hence considerable scope for implementing job crafting behaviours.

Only recently has a more general job crafting scale been published. This scale developed by Tims, Bakker, and Derks (2012), consisted of four dimensions representing four different types of job crafting: increasing social job resources, increasing structural job resources, increasing challenging job demands, and decreasing hindering job demands. In this way, similar to their previous work (e.g., Tims & Bakker, 2010), these authors frame their conceptualisation of job crafting within the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2000, 2001), which posits that job characteristics can be categorised into two opposing classes: job demands and job resources. Job demands consist of those physical, social, or organisational aspects of jobs that require sustained mental and physical effort, and are thus associated with psychological costs such as burnout and exhaustion. Examples of job demands include work-load and time pressures (Demerouti et al., 2000). Job resources are those physical, social or organisational characteristics of jobs that aid the achievement of work goals or stimulate personal growth or development (Demerouti et al., 2001). Examples of job resources are performance feedback

and task variety (Demerouti et al., 2000). Job resources are therefore an important buffer to the psychological costs associated with job demands (Bakker, Demerouti, & Euwema, 2005; Bakker et al. 2007). Tims et al. (2012) suggest that job crafting reflects the changes that employees make to balance their job demands and job resources with their personal needs and abilities. Framed within the JD-R model, then, job crafting is a process by which employees seek to maximise their job resources and minimise their job demands.

The Importance of Cognitive Crafting

Tims et al. (2012) made a practical and creative contribution by framing job crafting within the JD-R model and, indeed, many types of job crafting behaviours are attempts to increase job resources and decrease job demands. However, we argue that a job crafting measure that addresses the cognitive component of job crafting is also needed. This is because crafting cognitions about work is an important way in which individuals can shape their work experience (Wrzesniewski & Dutton, 2001). It also permits another avenue from which to exert some influence over one's job and may suit particular types of jobs or employees. Moreover, it allows employees to appreciate the broader effects of their work and to recognise the value that their job may hold in their life.

Cognitive crafting is perhaps the facet of job crafting that aligns most closely to "work identity", which is essentially how people define or perceive themselves at work (Bartel & Dutton, 2001; Wrzesniewski & Dutton, 2001). According to Wrzesniewski and Dutton (2001), a large part of one's work identity is cognitive, in that it helps people realise a more global conception of themselves at work where they can make claims about what work is and what it is not. While one's work identity cannot be changed at will, employees can make claims about whom they are as employees and why their work matters. These claims form the identity that each employee creates for himself or herself at work and ultimately changes

the personal meaning that is reflected in their work more generally. Wrzesniewski and Dutton (2001) cite a hypothetical scenario about physicians who alter the way in which they cognitively frame their job. Physicians, as providers of health services, can view their work in several ways. For example, they might frame work about healing people into heightened states of positive physical well-being. Alternatively, they might frame work about acting upon illness, disease, or injury to merely keep people alive and functioning with the technology and equipment available to them. Through cognitive crafting, employees can alter the way in which they see their work in order to obtain a more positive work identity, and ultimately, derive an enhanced level of meaning and purpose from their work. It is our view that a job crafting measure needs to include this important component of job crafting.

Although some items of the Tims et al. (2012) scale are focussed on reducing the psychological and emotional costs of hindering job demands (e.g., “I make sure my work is mentally less intense”; “I try to ensure my work is emotionally less intense”), it remains unclear whether these items refer to employee behaviour or employee cognitions. For example, employees could make their work emotionally less intense by changing their workplace behaviours (e.g., working on projects that are less emotionally draining; seeking more help from others), or in contrast, by changing their cognitions (e.g., thinking about how one’s job gives value to one’s life as a whole; thinking about the aspects of one’s job that are emotionally rewarding). It is important for a scale of job crafting to assess the cognitive component of the construct as doing so will enable researchers to investigate the full range of antecedents and consequences for each dimension. It will also allow researchers to examine several more specific questions about job crafting. For example, a new scale will allow researchers to investigate whether the cognitive component of job crafting explains as much variance in important employee outcomes as the other, more behavioural components of task

and relational crafting. It may also shed light on where certain types of job crafting fit in temporal sequence. It is possible, for example, that cognitive crafting precedes the more behavioural attempts to craft work, perhaps because cognitive crafting may be implemented more quickly and with less discretionary effort than the more behavioural activities of relational and task crafting. Finally, it is currently unknown whether all three forms of job crafting need to be demonstrated in order to produce lasting changes in employee outcomes. A new scale which includes all three forms will allow scholars to examine these important research questions.

Aim and Hypotheses

The aim of this study is to develop the Job Crafting Questionnaire (JCQ). The JCQ is designed to measure the original types of activities that represented job crafting and is hence, consistent with Wrzesniewski and Dutton's (2001) original job crafting model that includes task, relational, and cognitive forms of job crafting. These three types of activities represent three distinct yet meaningful ways in which employees can shape their work experience. Thus, it was hypothesised:

Hypothesis 1: The JCQ items load on three dimensions that represent task, relational, and cognitive forms of job crafting, and this model will fit the data better than a single factor model.

Another aim of the present study was to examine the convergent and discriminant validity of the JCQ by correlating the job crafting dimensions with other theoretically related constructs. As job crafting has been described as a form of discretionary behaviour that is driven by the employee rather than by management (e.g., Grant & Ashford, 2008), it was anticipated that all dimensions of the JCQ would be positively correlated with other self-

initiated proactive behaviours that employees can exhibit at work to enhance their enjoyment or performance. Thus, it was hypothesised:

Hypothesis 2: There is a positive relationship between the JCQ and employees' tendency to engage in organisational citizenship behaviour (OCB) – a form of discretionary behaviour that promotes the effective functioning of the organisation (Organ, 1988). This prediction was made, as similar to OCB, job crafting is a form of discretionary behaviour that employees initiate at work to change their work experience.

Hypothesis 3: There is a positive relationship between the JCQ and employees' strengths use. This prediction is made as using one's strengths at work could potentially be considered a special form of task crafting whereby employees select those tasks in which they are more skilled, experienced, or hold more natural talent. Hence, it is likely that employees who use their strengths at work are also likely to see themselves as active job crafters.

Hypothesis 4: There is a positive relationship between the JCQ and setting intrinsically motivated (i.e., self-concordant; Sheldon & Elliot, 1999) work-related goals. This prediction is made because intrinsically motivated goals are those that are consistent with employees' inherent interests and values. Job crafting activities are initiated so employees can make subtle changes within their job boundaries in order to enhance these intrinsic work qualities. Thus, employees who are motivated by the intrinsic enjoyment and satisfaction that their work brings are likely to engage in job crafting, which is a potential method by which employees can enhance these intrinsic features of one's job by ultimately making their work more consistent with one's personal interests, skills, and desires.

Given that job crafting is a form of self-initiated behaviour that employees use to make their work more meaningful and enjoyable, it was further hypothesised that the JCQ would be related to other work-specific emotions and cognitions. Hence, it was hypothesised:

Hypothesis 5: There is a positive relationship between the JCQ and the constructs of employee job satisfaction, work contentment, work enthusiasm, and work-specific positive affect.

Hypothesis 6: For the same reason it was hypothesised that the JCQ is negatively related to work-specific negative affect.

Scale Development

Although job crafting is a conceptually appealing concept on which to design behaviour based interventions, until recently there has been little effort to establish a quantitative measure of the construct that can be used in psychological research. Only recently have findings began to emerge that suggest job crafting is an important predictor of important employee outcomes, such as work engagement, cynicism, employability and performance ratings (Petrrou et al., 2012; Tims et al., 2012). Beyond these studies however, there has been a dearth of research into the empirical relationships between job crafting and employee outcomes. There has been even less research examining the relationship between cognitive crafting and employee outcomes. The goal of this study was therefore to address this gap with the development and validation of an objective measure of job crafting that aligned with Wrzesniewski and Dutton's (2001) original three-component job crafting model, which could ultimately be used to explore these important relationships. We first describe the process of constructing the JCQ and subsequently present both the exploratory and confirmatory factor analytic results of the scale's factor structure, the internal consistency of the scale and evidence of convergent and discriminant validity.

Method

Participants

Data from a sample of 334 employees was included in the quantitative analysis, which involved both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of the scale items. This sample was recruited through various means, including social networking sites, online discussion forums, and through staff email and newsletters of organisations that had agreed to invite their staff to participate. All participants were at least 18 years of age and were in paid employment. The invitations directed participants to an explanatory statement that contained a link to the questionnaires. Participation in this study was voluntary.

Because the JCQ was a part of a larger battery of psychological questionnaires, many participants dropped out after having completed the job crafting items, thus limiting the demographics information to 253 participants in total (75.7%). These complete cases were used in the convergent and discriminant analyses, where the complete data set was needed. T-tests revealed that there were no mean differences with respect to any of the study variables between the complete and missing data sets (all p 's > .05), suggesting that the missing data were missing at random (Little & Rubin, 2002). Of the complete cases, more than half were female (66.8%) and the mean age was 41.94 ($SD = 11.38$). The majority worked full-time (76.4%), and on average participants worked 38.02 hours per week. Most employees worked in education (68.0%), followed by banking and financial services (6.4%), and healthcare (6.0%). The mean income was \$76,371 (AUD) per annum, and the mean years of education was 17.60 ($SD = 3.56$).

Scale Construction

The questions were developed to measure the extent to which employees engaged in the types of activities that were consistent with Wrzesniewski and Dutton's (2001) original job crafting model that consisted of task, relational, and cognitive forms of crafting. Most items were original but four items were adapted from Leana, Appelbaum, and Shevchuk (2009), who developed a measure of job crafting specifically for teachers in education settings. Their scale consisted of the task and relational forms of crafting (at both the individual and group level), but omitted the cognitive form of crafting. Only those items that were adaptable to more general working environments were selected from this scale, and were hence altered for appropriate use with more general working samples by removing any reference to education or class-room based environments. These items provided theoretically consistent examples of ways in which employees might engage in task or relational crafting at work and were hence incorporated into the present study. All items that were developed to measure the extent to which employees engage in cognitive crafting in the present study were original.

By reviewing the extant literature on what constituted the types of activities that represented job crafting, as well as examining the existing measures of job crafting, a preliminary set of 27 items was developed and administered to a separate sample of 23 working adults for qualitative analysis. These participants were known to the researcher and provided feedback about items they deemed to be clear and thus should be retained, and also items they deemed to be confusing and should be either eliminated or reworded. They also provided feedback about whether each item made sense within a general working context. Based on this analysis, a final set of 21 items was retained for the EFA and CFA components of the study. Upon consultation with the participants who provided feedback, four of these 21 items were also reworded to enhance clarity and relevance to suit more general working

samples. The final set of 21 items consisted of seven items for each of task, relational, and cognitive forms of job crafting.

Procedure

Once the preliminary set of 21 items were developed and adjusted based on participant feedback, they were administered to a working sample for quantitative analysis. The majority of the sample was invited to participate through the organisation for which they worked. These organisations consisted of a large Australian university, a large Australian banking and finance company, and a large Australian health insurance company. In each case, an organisational representative sent an email to the employees inviting their staff to participate. It was made known to participants that they could choose not to participate and that their managers would never gain access to their responses. The remaining participants were recruited through advertisements on social networking sites and online discussion forums. All participants were offered the choice to enter a lottery to win an 8GB iPod touch as an incentive. The initial email or advertisement contained a link to the study explanatory statement, which then directed participants to the questionnaires. The set of questionnaires was counterbalanced to ensure that the order of presentation of each questionnaire was not the same for the entire sample.

The job crafting questionnaire was introduced with the following statement: *“Employees are frequently presented with opportunities to make their work more engaging and fulfilling. These opportunities might be as simple as making subtle changes to your work tasks to increase your enjoyment, creating opportunities to connect with more people at work, or simply trying to view your job in a new way to make it more purposeful. While some jobs will provide more of these opportunities than others, there will be situations in all jobs where one can make subtle changes to make it more engaging and fulfilling.”* Participants were then

instructed to indicate the extent to which they engaged in each job crafting behaviour or cognition on a Likert-type scale from 1 (hardly ever) to 6 (very often).

Overview of Statistical Analyses

Analyses were conducted in four stages. First, an EFA was conducted on the scale items. Following this a CFA was undertaken. The internal consistency, as well as convergent and discriminant validity of the scale were then examined. The methods used in the four stages are described in detail below.

Stage 1: Exploratory factor analysis. In the first stage, an EFA was conducted to determine a workable factor structure. Of the total 334 participants, a sub-sample of 151 participants was randomly selected using the randomisation function of SPSS 19. An EFA with maximum likelihood extraction was then conducted on this sub-sample to determine the factor structure of the 21 job crafting items. Due to previous literature indicating a threshold loading of .40 (Gorusch, 1983), items that did not meet this cutoff, as well as items that cross-loaded on multiple factors, were dropped one at a time. This process was repeated until the solution showed a simple structure (Thurstone, 1947), and all items met the inclusion criteria.

Stage 2: Confirmatory factor analysis. Using AMOS 19 (Arbuckle, 2010), a CFA was subsequently conducted on the remaining 183 participants of the total sample to determine whether the factor structure required modification. The CFA was used to confirm the exploratory model, and if possible, to refine the model using a separate sample of participants. CFA is a form of structural equation modelling that is used to determine the goodness of fit between a hypothesised factor structure and the sample data. Decisions concerning whether or not to add a path in the model are determined by a combination of

logical, theoretical and empirical indications. Modification indices are the empirical indicators used by AMOS to suggest paths that will improve the fit of the model. This often involves allowing the error terms of various items in the model to be correlated. However, it was determined *a priori* that there was no strong theoretical rationale for using such a procedure in this analysis. Thus, it was decided that a more appropriate method was to exclude problematic items (Levine et al., 2006). Problematic items were defined as those with highly correlated error terms and/or those which loaded on the wrong factor. Further, not permitting correlations between error terms increases the chances that the factor structure will replicate across samples (Bryne, 2010).

In the CFA, the factor loading of one indicator variable to each latent variable was fixed to 1.0. This established the metric of each latent variable. Correlations were allowed between the pairs of latent variables in the model, as theoretically, different types of job crafting behaviours should be related to each other. Correlations between other variables were fixed to 0.0.

To assess model fit, we followed the recommendation of Marsh, Balla, and Hau (1996) by using multiple fit indices. Moreover, as per the recommendations of Jaccard and Wan (1996), a range of fit indices across different classes of fit indices were used. Hence, five indices guided our assessment of model fit: chi square/*df* ratio (χ^2/df), the Non Normed Fit Index (NNFI; Tucker & Lewis, 1973), the Comparative Fit Index (CFI; Bentler, 1990), the Incremental Fit Index (Bentler & Bonnet, 1980), and the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993). Values above .90 for the NNFI and IFI (Byrne, 1994) as well as values above .93 for the CFI indicate a good fit (Hu & Bentler, 1992). The χ^2/df ratio provides an estimate of model fit that is less sensitive to sample size than the regular chi square index. Generally, values less than 3 indicate a good fit (Kline,

1998; Ullman, 2007). The RMSEA takes into account the error of approximation in the population and tests how well the model would fit the population covariance matrix if it were available (Bryne, 2010). Values less than .08 indicate reasonable fit (Browne & Cudeck, 1993), and values less than .05 indicate a good fit (Stieger, 1990). Values greater than 1.0 should lead to model rejection (Cudeck & Browne, 1993; MacCallum, Browne, & Sugawara, 1996). The chi-square test statistic was not used as an index of model fit because it is likely to reject a good fitting model due to trivial differences between the correlations and the covariances in the observed and predicted matrices (Meyers, Gamst, & Guarino, 2006).

Stage 3: Reliability analysis. Internal consistency was assessed by computing Cronbach's alphas for the job crafting dimensions, as well as the total scale. These estimates were calculated before and after the factor analysis stage where items were dropped. Although alpha estimates provide limited practical information about a measure when used in isolation, when used in combination with EFA and CFA it can be useful in supporting the reliability of a scale after its multi-dimensionality has been confirmed (Levine et al., 2006).

Stage 4: Convergent and discriminant analyses. To assess convergent and discriminant validity, the JCQ was correlated with other constructs with which it should theoretically be related. The measures that were used in the convergent and discriminant analyses are detailed in the following section.

Measures

Job crafting. Job crafting was measured with the final JCQ developed in this study (see Appendix A). The complete measure consisted of 15 items and participants indicate the frequency with which they have engaged in each job crafting activity from 1 (hardly ever) to 6 (very often).

Strengths use. The extent to which participants used their strengths was assessed with Govindji and Linley's (2007) 14-item Strengths Use Scale. An example item is "My work gives me lots of opportunities to use my strengths". Participants indicate the extent to which they agree with each statement from 1 (strongly disagree) to 7 (strongly agree). These authors reported a Cronbach's alpha of .95. An equivalent reliability (.95) was found with the current study's data set. Govindji and Linley (2007) found the items to load on a single factor that reflected the extent to which respondents used their strengths. Moreover, the scale correlated moderately to strongly with self-efficacy (.63), self-esteem (.56), subjective well-being (.51), psychological well-being (.56), and subjective vitality (.45), supporting its validity.

Intrinsic goal striving. Participants were asked to list two work-related goals and we then used the same method as Emmons (1986), as well as Sheldon and Colleagues (e.g., Sheldon & Elliot, 1999; Sheldon & Lyubomirsky, 2006), to calculate the extent to which these goals were intrinsically motivated. This procedure requests participants to list a work-related goal and subsequently rate whether it is pursued for external motivations (pursued to please others or for rewards), introjected motivations (striving to avoid guilt or self-criticism) identified motivation (pursued due to internal values or beliefs) and intrinsic motivation (pursued due to the intrinsic enjoyment and satisfaction from the task or goal itself). Participants rated the extent to which both goals were pursued for each of the four reasons by responding on a seven-point scale from 1 (not at all for this reason) to 7 (completely for this reason). As in past research (e.g., Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Lyubomirsky, 2006) an intrinsic motivation score was then calculated by averaging the intrinsic and identified ratings, and subtracting the averaged external and

introjected ratings for each goal. This scale had satisfactory reliability with a Cronbach's alpha of .74 for the current study's data set.

Organisational citizenship behaviour (OCB). OCB was assessed with the 13-item Podsakoff, Ahearne, and MacKenzie (1997) scale, which measures the helping, civic virtue, and sportsmanship components of OCBs. An example item is "I help out others if they fall behind in their work". Participants respond from 1 (strongly disagree) to 5 (strongly agree). Podsakoff et al. (1997) reported alpha coefficients of .95, .96, and .88 for the three components respectively. The full scale alpha coefficient using the current study's data is lower but still satisfactory (.79). Podsakoff et al. (1997) also showed the measure predicted work group performance, thus lending some support for the scale's validity.

Job satisfaction. The Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1979) was used to measure job satisfaction. An example item is "All in all, I am satisfied with my job", and participants respond from 1 (strongly disagree) to 7 (strongly agree). Cammann et al. (1979) reported a Cronbach's alpha of .77 and in the present study it was .90. Moreover, Bruck, Allen, and Spector (2002) showed that scores on the job satisfaction scale can be predicted from work family conflict.

Affective well-being. Affective well-being was measured with the Warr (1990) affective well-being scales. Six descriptor words were used to describe the anxiety-contentment axis (e.g., "Relaxed" for Positive Affect, "Tense" for Negative Affect) and the depression-enthusiasm axis ("Cheerful" for Positive Affect, "Miserable" for Negative Affect) of affective well-being. Participants indicated the frequency with which they had experienced each emotion at work on a 6-point scale from 1 (never) to 6 (all of the time). The scale had high internal consistency with Cronbach's alphas of .90 for the anxiety-contentment axis and .91 for depression-enthusiasm axis. Warr (1990) found that contentment was positively

related with job satisfaction and motivation (.21 and .20, respectively) and negatively related to work overload and distress (-.40 and -.46, respectively). Similarly, enthusiasm was positively related to job satisfaction and motivation (both .40), and negatively related to task repetition and distress (-.22 and -.39 respectively), supporting the scale's validity.

Work-specific positive affect (WSPA) and negative affect (WSNA). WSPA and WSNA were measured by calculating an average score for the six items that reflected both PA and NA in Warr's (1990) affective well-being measure. This scale also had high internal consistency with Cronbach's alphas of .92 and .93 for WSPA and WSNA, respectively.

Results

Exploratory Factor Analysis (N = 150)

EFA with maximum likelihood extraction and oblique rotation in SPSS 19 was used to determine if the factor structure of the 21 items was consistent with the original job crafting model (Wrzesniewski & Dutton, 2001). One case was missing most of their data for the job crafting items. This case was dropped listwise, leaving data from 150 participants for the analysis. The remainder of the missing values for each item was very low (0% to 2.0%), and multiple imputation methods were used to estimate these values (Little & Rubin, 2002).

Prior to performing the EFA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .89, exceeding the recommended value of .6 (Kaiser, 1970, 1974). Bartlett's Test of Sphericity was statistically significant, supporting the factorability of the correlation matrix (Bartlett, 1954).

Maximum likelihood extraction revealed the presence of three factors with eigenvalues exceeding 1. These factors explained 40.45%, 8.58%, and 7.19% of the variance respectively. An inspection of the screeplot revealed a clear break after the third factor, and

Catell's (1966) scree test indicated a three factor solution for further investigation. This was further supported by a parallel analysis, which showed three factors with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of equivalent size (21 variables \times 150 cases).

The three factor solution explained a total of 56.23% of the variance. To aid in the interpretation of these three factors, direct oblimin rotation was performed. The rotated factor solution resembled a simple structure, with all three factors showing several strong loadings. Those items that exhibited a cross loading or loaded greater than .35 on the wrong factor were deleted. Due to previous literature suggesting a threshold for factor loadings of .40 (Gorsuch, 1983), items that did not meet this cutoff were dropped. On this basis, two of the items for cognitive crafting were deleted. Another EFA was performed and a solution consisting of 19 items was retained, with a clear simple structure present in the data (Thurstone, 1947). These data are presented in Table 1. There were moderate to strong correlations between the three factors (from .42 to .57), supporting the use of oblique rotation.

Table 1

Items, means, standard deviations, and factor loadings of the three factor Job Crafting Questionnaire

		Factor				
Item		M	SD	1	2	3
Task Crafting						
1	Introduce new approaches to improve your work*	3.94	1.48	.75		
2	Change the scope or types of tasks that you complete at work	3.54	1.47	.92		
3	Introduce new work tasks that you think better suit your skills or interests	3.42	1.47	.86		
4	Choose to take on additional tasks at work	4.12	1.34	.58		
5	Give preference to work tasks that suit your skills or interests	4.09	1.39	.59		
6	Change the way you do your job to make it more enjoyable for yourself*	3.73	1.39	.74		
7	Change minor procedures that you think are not productive*	3.91	1.35	.66		
Cognitive Crafting						
8	Think about how your job gives your life purpose	3.69	1.46		.87	
9	Remind yourself about the significance your work has for the success of the organisation	3.48	1.41		.66	
10	Remind yourself of the importance of your work for the broader community	3.45	1.53		.81	
11	Think about the ways in which your work positively impacts your life	3.66	1.43		.85	
12	Reflect on the role your job has for your overall well-being	3.96	1.33		.69	
Relational Crafting						
13	Engage in networking activities to establish more relationships	3.68	1.48			.45
14	Make an effort to get to know people well at work	4.24	1.24			.77
15	Organise or attend work related social functions	3.39	1.56			.77
16	Organise special events in the workplace (e.g., celebrating a co-worker's birthday)*	3.16	1.61			.82
17	Introduce yourself to co-workers, customers, or clients you have not met	3.95	1.37			.65
18	Choose to mentor new employees (officially or unofficially)	3.48	1.51			.58
19	Make friends with people at work who have similar skills or interests	4.09	1.33			.62

Note: * indicates items that were adapted or taken from Leana, Appelbaum, & Shevchuk (2009).

Taken together, the results of the EFA support a three factor solution, with seven items loading on both task and relational crafting, and five items loading on cognitive crafting.

Confirmatory Factor Analysis (N = 180)

In order to examine if the three-factor solution fits the data best in the second sample, CFA was conducted using AMOS 19 (Arbuckle, 2010). As structural equation modelling requires a complete data set for each case (Bryne, 2010), it was determined *a priori* to drop any cases that were missing more than 5% of the items for the questionnaire. This approach led to three cases being excluded from the analysis, leaving data from 180 participants. The remainder of the missing values for each item was very low (0% to 2.2%), and multiple imputation methods were used to estimate these values (Little & Rubin, 2002).

CFA was performed initially on the 19 item scale, which indicated a reasonably poor fit to the data ($\chi^2/df = 2.44$, CFI = .89, NNFI = .88, IFI = .89, RMSEA = .09). Moreover, the RMSEA confidence interval was above the upper bound limit of .08 (Bryne, 2010). The modification indices suggested that two task crafting items (items 6 and 7) correlated with the wrong factor. A relational crafting item (item 17) correlated with the wrong factor, while another relational crafting item (item 13) was both poorly correlated with the relational crafting latent variable and the error term was correlated with several error terms for items that loaded on the cognitive and task crafting latent variables. On this basis, these four items were dropped, which left 15 items for the analysis: five for each latent variable. Another CFA was conducted and the model was substantially improved. The fit indices indicated a model that fit the data well, and are presented in the top row of Table 2.

Table 2

Confirmatory factor analysis of the three factor Job Crafting Questionnaire (N = 180)

Model	χ^2	<i>df</i>	χ^2/df	CFI	NNFI	IFI	RMSEA
Three factor model	149.01	87	1.71	.96	.95	.96	.06
One factor model	551.28	90	6.13	.68	.63	.68	.17

Note: χ^2/df = normed chi square, CFI = comparative fit index; NNFI = non normed fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation. The final scale consists of 15 items: 5 for each job crafting factor.

As can be observed in Table 2, the hypothesised three factor model was tested against a single factor model due to the possibility that job crafting is a uni-dimensional construct. For example, it is possible that the fact employees initiate changes to their work (uni-dimensional model) is more salient than the types of changes (hypothesised multi-dimensional model) employees initiate at work. Table 2 shows that the three-factor model fit the observed data better than the alternative one factor model, supporting Hypothesis 1. The NNFI and IFI were both above .90, the CFI was greater than .93, and the normed chi square was less than 3. The RMSEA was also small (.06), with the confidence intervals within the range suggesting acceptable fit (lower bound = .05, upper bound = .08). All fit indices support a three factor model. Moreover, all items loaded significantly and strongly on their respective latent variables, with standardised loadings ranging from .56 to .89 (all p 's < .001).

Reliability Analyses

Internal consistency statistics are presented in Table 3. The Cronbach's alphas of the three sub-scales were all well above the recommended threshold of .70 (Nunnally & Bernstein, 1994). Before items were dropped, the scale reliabilities were .90, .89, .86, and .94 for task, cognitive, relational, and total job crafting, respectively. As can be observed in Table 3, after the items were dropped through the CFA process, these reliabilities were lowered slightly, though not substantially.

Table 3

Reliability estimates for task, cognitive, relational, and total job crafting

<i>Scale</i>	Number of items	Cronbach's alpha
Task Crafting	5	.87
Cognitive Crafting	5	.89
Relational Crafting	5	.83
Total Job Crafting	15	.91

Note: $N = 334$

Convergent and Discriminant Validity

To examine the convergent and discriminant validity of the new scale, the job crafting sub-scales and total scale were correlated with other variables with which they should be theoretically related. These correlations are presented in Table 4. Composite scores were calculated by adding the scores for each construct and dividing by the total number of items.

Table 4

Correlations between the job crafting dimensions with job satisfaction, intrinsic goal strivings (work), strengths use, OCB, work contentment, work enthusiasm, work-related positive affect, and work related negative affect

<i>Construct</i>	1	2	3	4	5	6	7	8	9	10	11
1. Task Crafting											
2. Cognitive Crafting	.52**										
3. Relational Crafting	.42**	.53**									
4. Job Crafting Total	.81**	.83**	.77**								
5. Strengths Use	.43**	.39**	.36**	.49**							
6. Intrinsic Goal Setting (work)	.20**	.32**	.30**	.34**	.40**						
7. OCB	.40**	.33**	.41**	.47**	.35**	.22**					
8. Job Satisfaction	.38**	.45**	.21**	.43**	.41**	.30**	.24**				
9. Work Contentment	.29**	.26**	.13*	.28**	.24**	.25**	.14*	.62**			
10. Work Enthusiasm	.45**	.42**	.26**	.47**	.40**	.38**	.29*	.75**	.76**		
11. WSPA	.40**	.40**	.27**	.45**	.37**	.31**	.27**	.66**	.83**	.86**	
12. WSNA	-.25**	-.23**	-.11	-.26**	-.25**	-.30**	-.14*	-.67**	-.86**	-.84**	-.64**

Note: $N = 250$; OCB = Organisational Citizenship Behaviour; WSPA = Work-Specific Positive Affect; WSNA = Work-Specific Negative Affect.

* $p < .05$

** $p < .01$

It was predicted that all dimensions of the JCQ would exhibit positive correlations with similar behaviourally based indices of strengths use, intrinsic goal strivings at work, and OCB. As expected, all of these correlations were significant and in the expected positive direction. It was also predicted that the job crafting dimensions would be positively related with job satisfaction, work contentment, work enthusiasm, and WSPA. These correlations were also significant and positive. Finally, it was predicted that the job crafting dimensions would be negatively correlated with WSNA. Although the relationship between relational crafting and WSNA failed to reach statistical significance, it was in the expected negative direction. All other correlations were significant and negative, though the strength of these relationships was generally weaker than the relationships between job crafting and proactive behaviours and positive states.

Discussion

The aim of the present study was to develop and validate the JCQ, which can be used in psychological research to assess the extent to which individuals engage in job crafting activities. As hypothesised and consistent with Wrzesniewski and Dutton's (2001) job crafting model, the present study showed the job crafting items to load on the three dimensions of task crafting, relational crafting, and cognitive crafting. The EFA and CFA both revealed a three-factor structure that reflects each dimension of crafting, though the CFA worked best when problematic items were dropped from the measure. Hence, all three forms of crafting indicate different processes through which employees can take active roles in shaping their experience of work.

Also as hypothesised, the JCQ correlated in the hypothesised directions with other scales selected based on their theoretical association with job crafting. Thus, the JCQ dimensions exhibited positive correlations with other proactive behaviour based assessments such as

strengths use, intrinsic goal setting at work, and OCB. The scale was also positively correlated with job satisfaction, work contentment, work enthusiasm, and WSPA, and negatively correlated with WSNA. All correlations support the measure's convergent and discriminant validity. It is worth noting, however, that the JCQ exhibited weak, though generally significant, relationships with WSNA. It is possible, then, that job crafting holds a weaker influence on negative states than it does on positive states, probably because job crafting activities are directed at enhancing the enjoyment and satisfaction employees attain from their work. Hence, it is plausible that job crafting activities are used primarily by mentally healthy employees to enhance their work satisfaction and enjoyment rather than by dissatisfied or unhappy employees to lift themselves into states where their dissatisfaction, unhappiness, or other negative experiences are less intense. Job crafting, then, might be a useful strategy in enhancing the mental health and happiness of those people thought to be *languishing* (Keyes, 2002, 2003, 2007)—that is, people who neither suffer from mental illness nor experience positive mental health. It is these people who are often overlooked in psychological research (Keyes, 2003) and efforts to enhance their well-being will be a welcome addition to the literature. Further research is needed to confirm these findings using measures of other work-related negative states such as intention to leave, stress, exhaustion, or burnout.

The JCQ differed from existing measures of job crafting in three important ways. First, items were worded in a way that was relevant and meaningful for the general adult working population, rather than for specific working groups, occupations, or industries of interest. This allows the measure to be used in research involving a range of occupations, organisational contexts, or industries where scope exists for implementing job crafting activities. Second, the JCQ showed that cognitive crafting items loaded on a separate

construct to the other more behavioural features of task and relational crafting. This suggests that cognitive crafting—the processes through which employees frame their perception of their job in a more positive and meaningful light—forms a significant part of what constitutes job crafting. The JCQ hence aligns with the original three component model of job crafting put forward by Wrzesniewski and Dutton (2001). This is important because, as argued by Wrzesniewski and Dutton, employee cognitions are an important component of what composes the experiences of a job. Employees can shape these cognitions, and in so doing, shape the way in which they approach and experience their work. Moreover, cognitions about work form an important part of our work identity (Wrzesniewski & Dutton, 2001) and crafting cognitions is a method by which employees can shape the way they define or perceive themselves at work. Through cognitive crafting, employees have the capacity to adopt a more positive and meaningful view of their work, which may ultimately have corresponding influences on employee well-being, turnover, or engagement. Although these relationships were not tested here, the JCQ opens these questions to empirical inquiry. Third, the JCQ is quite brief in terms of its number of items. Still, it retains equally notable factorial validity, convergent and discriminant validity, as well as reliability statistics to previous measures. Researchers constrained for time may find it useful to assess job crafting using a more efficient measure than those developed previously, such as the JCQ. The fact that the measure fits without allowing error terms to correlate also increases the chance that it will hold up across different working populations.

There are several implications of this study for the progression of job crafting research. First, an alternative general scale can now be used to assess the extent to which employees craft their jobs. Due to its consistency with the original job crafting model conceptualised by Wrzesniewski and Dutton (2001), it will allow researchers to assess the relationships between

all three types of job crafting and different employee outcomes. Hence, the full range of antecedents and consequences of each dimension of job crafting can now be explored. Second, there is at present no research to our knowledge that has explored whether job crafting affects workplace outcomes, and similarly, there is no theory about the underlying mechanisms that explain *how* job crafting might affect these outcomes. The JCQ will allow researchers to address these gaps by providing them with a statistically validated tool to progress job crafting research, and ultimately, establish a sound theory by which job crafting affects work outcomes.

The current findings should be interpreted in light of some limitations. First, the sample was quite homogenous in terms of their education, nationality, and income, probably because most participants worked either in education or the corporate sector in Australia. The average years' education was 17.60, which is well above the length of time required to obtain a secondary education in most countries. Moreover, the average income was quite high, indeed higher than the average contemporary working income in most countries. This negates the generalisability of the findings to more diverse groups of workers, including, for example, the blue-collar sector and employees from diverse cultural groups. Another limitation is that the sample was not large enough to conduct an invariance test to determine whether the factor structure of the scale is sustainable across the wider adult working population. Invariance tests from different employee populations, such as blue-collar workers or employees working in different cultures would further elucidate how these employees craft their jobs to enhance the experience of work. An invariance test will also allow researchers to further confirm the factor structure of the measure and cross-validate it in a separate sample beyond corporate Australia.

In conclusion, the JCQ fits a three factor structure, supported by the results of both EFA and CFA. The total scale, as well as its individual dimensions, have demonstrated high internal consistency reliability. In addition, the measure correlates in theoretically expected directions with other similar, previously validated measures, thus supporting its convergent and discriminant validity. Therefore, it is anticipated that the JCQ can be used to further progress job crafting research. At the same time, further assessments should continue with diverse samples to provide cumulative and substantial psychometric evidence for this new measure. Ultimately, with the development of a theoretically based, practical, and psychometrically sound job crafting measure, more information about the efficacy and applied utility of job crafting interventions can be gained to improve employees' quality of work life.

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5.0 CHAPTER 5

ASSUMPTIONS OF MODEL TESTING WITH STRUCTURAL EQUATION MODELLING METHODS

With cross sectional data, structural equation Modelling (SEM) presents researchers with a powerful multivariate analysis technique with which they can measure the strength of relationships between observed (i.e., measured) and unobserved (i.e., latent) variables. As with all statistical methodologies, SEM requires that certain underlying assumptions be satisfied to ensure accurate inferences are made. Given SEM was a prevalent methodology used throughout this dissertation, this chapter will focus on addressing the underlying assumptions of SEM with respect to the cross sectional data used in the present studies.

Assumptions for Structural Equation Modelling

There are some assumptions that need to be considered when conducting analyses with SEM. These include missing data, multivariate normality and outliers, linearity, and absence of multicollinearity and singularity (Ullman, 2007).

Missing Data

An advantage of SEM is that missing data mechanisms can, in some instances, be included in the model (Ullman, 2007). Some software packages now include procedures for estimating missing data, however, AMOS does not offer this procedure. Although AMOS models can be estimated with incomplete data, this impedes the program's ability to provide key post analysis statistics, including the modification indices. Hence, with AMOS, procedures are needed in order to estimate the missing values and this step can be undertaken at an earlier stage with SPSS.

There were two types of missing data relevant to the analyses. First, because the battery of questionnaires was quite extensive—taking participants 32 minutes and 33 seconds to complete on average—many participants dropped out after having completed only the first few measures. This meant that their responses for the measures at the end of the battery were

missing entirely. Estimating these values would, in most cases, apply to greater than 50% of the values for these participants. Moreover, it would involve estimating these participants' values for several entire scales. This was not a realistic option, and it was decided that the data from these participants would be excluded from any analysis other than the factor analysis of the JCQ – which was always the first measure in the battery and hence had almost no missing data. T-tests revealed that there were no mean differences on any study variable between participants who completed the entire battery and those who dropped out (all p 's > .05), suggesting that these missing data were missing at random (Little & Rubin, 2002).

The second type of missing data involved participants who had made a realistic attempt to complete each measure, but for whom one or more non-responses were present for various items within a scale. As SEM requires a complete response for each case (Byrne, 2010), it was determined the best path forward was to use formal strategies to estimate this missing data. This is considered a good option where the number of these cases is low and hence listwise deletion does not result in substantial amounts of lost data (Ullman, 2007). Four cases had missing data on up to 12% of items; the remaining number of the missing values for each participant was very low (from as low as 0% to as high as 2.2%).

There are many procedures for estimating missing values. As both listwise and pairwise deletion can result in a great loss of data (Kim & Curry, 1977; Roth, 1994), these methods were not used in the scale validation or model testing study where it was the goal to retain as many usable cases as possible. Two other methods that are commonly used are mean substitution or regression imputation. However, mean substitution tends to attenuate variance estimates (Roth, 1994) and, in some cases, produces less accurate correlation matrices than listwise deletion (Kim & Curry, 1977) and is not recommended as good practice (Graham, 2009). Another option is to use regression imputation. Although regression imputation has

several advantages, caution is warranted when using this approach. In some instances the imputed values may fall beyond the logical limits of the values for each variable (Little, 1988). Moreover, when independent variables are used to estimate values with regression imputation, the relationships under investigation may be artificially inflated (Raymond & Roberts, 1987). Hence, regression imputation is not recommended in general (Graham, 2009).

Multiple imputation, where the missing data are imputed by a value that is predicted using the participants' other characteristics, is considered a good form of estimation where the missing data is small and at least missing at random (Donders et al., 2006; Ullman, 2007). In the case of the studies in this dissertation, the number of missing responses on the complete data set was very small (as detailed earlier) and hence most estimation methods were appropriate. Multiple imputation (MI) methods were chosen due to the reasons provided by Schafer and Graham (2002), who argue that MI retains all of the benefits of single imputation procedures, but solves the problem of underestimating the values. It also provides researchers with the freedom to use complete-data techniques, such as SEM with AMOS software.

Multivariate Normality

Most of the estimation methods used in SEM make the assumption of multivariate normality (Ullman, 2007). To determine the normality of the data used in the analyses throughout this dissertation, the variables were first screened for univariate and multivariate outliers, and subsequently for non-normality. Although some univariate outliers were found in the data, they were not significantly affecting the results as revealed by the 5% Trimmed mean. The Trimmed mean is the alternative mean value that SPSS recalculates after the top five percent and bottom five percent of the values in a distribution have been removed. The

Trimmed mean values very closely approximated the actual mean values in all cases where outliers were detected, suggesting that the outliers were not adversely affecting the data (Pallant, 2007). No multivariate outliers were detected. SPSS also indicated that some distributions were not normally distributed, and were typically negatively skewed for positive concepts (e.g., positive affect, well-being) and positively skewed for negative concepts (e.g., negative affect). Although it is necessary to test for multivariate normality even if all univariate distributions in the data are normal, the fact that several univariate distributions were not normally distributed meant it was highly probable that multivariate normality would not be satisfied with the current data set.

AMOS revealed that the data did not satisfy the multivariate normality assumption. Violations of this assumption tend to affect SEM analyses in that it makes it more difficult to produce a well fitting model (Anderson & Gerbing, 1988; Byrne, 2010). Maximum likelihood parameter estimates in moderately sized samples are generally robust against violations of multivariate normality (Browne, 1984). The problem is that the asymptotic standard errors, as well as the overall chi-square statistic are not robust against a violation of this assumption (Anderson & Gerbing, 1988). More specifically, the overall chi-square statistic will tend to be inflated and thus indicate a poorly fitting model, and the standard errors may produce critical ratios that overestimate the significance of the parameters in the model (Byrne, 2010). Hence, to correct for this problem with the present data set, two procedures were followed. First, the chi-square statistic was not the primary index used to assess model fit. This was because it is affected by the failure to satisfy multivariate normality, and also because it is likely to reject a good fitting model due to trivial differences between the correlations and the covariances in the observed and predicted matrices (Meyers, Gamst, & Guarino, 2006). Second, an adjustment was undertaken for the significance level

of the parameters. Instead of the accepted level of $\alpha = .05$, the current analyses were conducted according to a more rigorous criteria of $\alpha = .01$. This ensured that the significance of the parameters was not overestimated on either of the studies in this dissertation. The highest p value for the standardised parameter estimates in the structural model was .009, which was for the path between cognitive crafting and need satisfaction. The rest were all well below .01. Hence, *all hypothesised* paths in the model are significant at the adjusted $\alpha = .01$ level, and there is confidence that the significance of the relationships in the model were not overestimated.

Linearity

SEM methods are only capable of examining linear relationships among the variables. Although linearity among latent variables is difficult to gauge, linearity among pairs of variables can be examined through an inspection of scatterplots (Ullman, 2007). Hence, scatterplots between the hypothesised pairs of variables in the full structural model were examined with SPSS. The scatterplots indicated that all of these relationships were linear.

Multicollinearity and Singularity

There were no variables that were linear combinations of other variables, and hence the problems of multicollinearity and singularity were absent in the data. The correlation matrix was also examined to determine whether any pairs of variables were extremely highly correlated. Although some correlations were strong (around .60), none were high enough to suggest a variable was redundant.

Conclusion

The aim of this chapter was to provide some supplementary but important information about the assumptions of SEM methods. As SEM is an asymptotic procedure, which assumes

that large sample sizes are necessary to give stable parameter estimates (Bentler, 1995), it was necessary to address how missing data issues were dealt with and to empirically justify the procedures that were used. It was argued that the best method to deal with missing data was to use multiple imputation methods where the number of missing responses was small. Cases with large numbers of missing responses were omitted from the analysis. This chapter also addressed the ways in which multivariate normality was managed, as well as how the linearity, and multicollinearity and singularity issues were checked. This discussion will ultimately provide additional clarity and strength to the subsequent and final paper of the dissertation.

2. Chapter Six – Research Paper 3 Declaration

Optimising employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-being.

Monash University

Declaration for Thesis Chapter 6

Declaration by candidate

In the case of Chapter Six, the nature and extent of my contribution to the work was the following:

Name	Nature of Contribution	Extent of contribution (%)
Mr Gavin Robert Slemp	Primary Author	75%

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of Contribution	Extent of contribution (%) for student co-authors only
Dr Dianne A. Vella-Brodrick	Secondary Author	25%

Candidate's Signature	Date

Declaration by all co-authors

The undersigned hereby certify that:

- 1) The above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors;
- 2) They meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;

- 3) They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
- 4) There are no other authors of the publication according to these criteria;
- 5) Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor of the publisher of journals or other publications, and c) the head of the responsible academic unit; and
- 6) The original data are stored at the following locations(s) and will be held for at least five years from the date indicated below:

Location(s)

School of Psychology and Psychiatry, Monash University Caulfield Campus

Signature 1	Date
Signature 2	Date

6.0 CHAPTER 6

PAPER 3

OPTIMISING EMPLOYEE MENTAL HEALTH: THE RELATIONSHIP BETWEEN
INTRINSIC NEED SATISFACTION, JOB CRAFTING, AND EMPLOYEE WELL-
BEING.

Accepted with revisions at the *Journal of Happiness Studies*

Abstract

Organisations are frequently confronted with the issue of how to enhance employee mental health. Based on Self-Determination Theory, a model is proposed that examines the relationships between job crafting, the satisfaction of the intrinsic needs for autonomy, competence, and relatedness at work, and employee well-being – defined here as both subjective well-being and psychological well-being. A sample of 253 working adults completed a battery of questionnaires including the job crafting questionnaire, the Intrinsic Need Satisfaction Scale, and the Mental Health Continuum. Using Structural Equation Modelling (SEM) methods, it was determined that job crafting predicted intrinsic need satisfaction, which, in turn, predicted employee well-being. The results suggest that job crafting may be an important underpinning upon which to base an employee well-being intervention.

Keywords: Job Crafting, Well-Being, Self-Determination Theory, Autonomy, Competence, Relatedness, Need Satisfaction

Optimising employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-being.

Paid employment is a fundamental part of adult life. It comprises about a third of one's conscious experience, and is an important source from which to develop a sense of identity, establish relationships, and firm one's self-esteem (Markiewicz, Devine, & Kausilas, 2000; Pierce & Gardiner, 2004; Pratt, Rockmann, & Kaufmann, 2006). Given this significance, there exists a need to examine ways in which employees can enhance their work experience so as to attain a greater sense of purpose, meaning, and ultimately, well-being. One promising, yet relatively unexplored concept in the literature is job crafting (Wrzesniewski & Dutton, 2001).

Job Crafting Conceptualisation

Job crafting is described as the ways in which employees take an active role in initiating physical or cognitive changes to the way in which they approach their work. Rather than making changes to the structural characteristics of their jobs, job crafting is an informal process that focuses on the positive changes that employees can make within their job boundaries. They initiate these informal changes in order to shape their work practice to align with their idiosyncratic interests and values, and ultimately, enhance the enjoyment, meaning, and satisfaction they attain from their work. In this way, job crafting is a form of proactive behaviour, driven by employees rather than management (Grant & Ashford, 2008). Wrzesniewski and Dutton (2001) identify three ways in which employees can craft their jobs. *Task crafting* refers to initiating changes to the number or type of activities one completes on the job (e.g., introducing new tasks that better suit one's skills or interests). *Relational crafting* involves exercising discretion about whom one interacts with at work (e.g., being

proactive about making friends with people who possess similar skills or interests).

Cognitive crafting is distinct from task and relational crafting in that it involves altering how one ‘sees’ their job, with the view to making it more personally meaningful (e.g., making an effort to recognise the effect of one’s work on the success of the organisation or community). All three types of job crafting represent unique ways in which employees initiate changes within their job boundaries in order to enhance their work enjoyment and purpose.

Most of the research on job crafting to date has been qualitative or theoretical in nature (e.g., Berg, Grant, & Johnson, 2010; Berg, Wrzesniewski, & Dutton, 2010; Fried et al., 2007; Lyons, 2008; Wrzesniewski & Dutton, 2001). This is probably because, until very recently (e.g., Tims, Bakker, & Derks, 2012), there has been no generic and universal questionnaire with which the construct can be reliably and validly measured. Previous efforts to develop a measure have focused on specific populations of interest, such as manufacturers (e.g., Ghitulescu, 2006) and teachers (Leana, Appelbaum, & Shevchuk, 2009), and are thus not appropriate for the general adult working population. Hence, despite job crafting representing a promising process employees can use to enhance their work experiences, beyond the work of Tims et al. (2012) and Petrou et al. (2012), at present there has been a dearth of research on the relationships between job crafting and important employee outcomes, particularly well-being. This gap in the literature will be explored in the present study.

Well-Being and Work Behaviour

Well-being is defined here as the presence of optimal psychological functioning, and the literature identifies two distinct approaches to well-being research (Deci & Ryan, 2008; Ryan & Deci, 2001). First, there is the hedonic approach, which is captured by the concept of subjective well-being (SWB; Diener et al., 1999; Diener, 2000). SWB is the scientific term

attributed to happiness or ‘the good life’, and can be broken down into two further components. The cognitive component refers to an individual’s satisfaction with their life as a whole, whereas the affective component refers to the presence of high positive affect (PA) and the relative absence of negative affect (NA). The second approach to well-being is the eudaimonic approach, which can be defined broadly as embracing the existential challenges of life (Linley et al., 2009; Keyes, Shmotkin, & Ryff, 2002), or the actualisation of human potential (Ryan & Deci, 2001). It recognises that not all human pursuits result in optimal well-being, despite the fact that they are pleasurable. The eudaimonic approach is best captured with the concept of psychological well-being (PWB), and hence represented with Ryff’s (1989) six factors of positive functioning: self-acceptance, purpose in life, autonomy, personal growth, environmental mastery, and positive relationships with others. These factors provide increased precision and guidance about what it means to achieve eudaimonic living.

Although many studies have ignored the eudaimonic approach to well-being due to a lack of theoretical consistency in its definition (Kashdan, Biswas-Diener, & King, 2008; Linley et al., 2009; Waterman, 2008), it is important for research to incorporate both approaches into well-being research. Consistent with this view, Linley et al. (2009) found both SWB and PWB to load on two distinct, yet related components of a higher order well-being construct. Hence, this operationalisation captures a more comprehensive well-being model that helps clarify what it truly means to be psychologically healthy. It also allows researchers to determine whether various workplace activities explain variance in mental health beyond the hedonic, pleasurable component. Moreover, it allows researchers to determine whether different interventions affect different well-being outcomes.

Job crafting is one such process through which employees can enhance the meaning they attain from their work, and in so doing, optimise their well-being. An underlying premise of job crafting is that employees use it to align their work with their individual needs and values. Job crafting, then, likely results in work that is more fulfilling, offers greater opportunity to establish relationships, and also enhances the individual purpose, meaning, and value that employees attain from the daily activities they encounter on the job. It potentially shifts the motivation to work beyond the material or financial benefits that work offers, toward a state where the motivation to work is attained from the intrinsic enjoyment and satisfaction from the work itself. Hence, job crafting is a process through which employees can turn their ordinary jobs into an occupational *calling* – defined broadly as an occupation that an individual is drawn to, finds intrinsically enjoyable and meaningful, and perceives as a central part to their identity (Wrzesniewski et al., 1997). Indeed scholars have suggested that job crafting is a process employees use to facilitate the kinds of pleasurable psychological states that are associated with pursuing occupational callings (Berg, Grant, & Johnson, 2010).

The concept of an occupational calling aligns closely with the fundamental principles of both employee PWB and SWB. Those who work in an occupational calling tend to see their work as the most important part of their life. They tend to take their work with them on holidays, derive a great sense of pleasure from their daily activities, and intrinsically love their job (Wrzesniewski et al., 1997). All such experiences can make employees feel good about their work because they think it will make the world a better place, resulting in enhanced meaning, purpose, and fulfilment – all of which are associated with eudaimonic living, and hence, PWB. Those working in an occupational calling are also likely to experience an enhanced level of pleasure and enjoyment from their work, and thus SWB. Supporting these relationships, Wrzesniewski et al. (1997) showed that calling employees

reported higher job satisfaction and miss fewer days of work on average than employees who viewed their occupation as simply a means to earn money (i.e., a 'job'), or as a way to earn promotions into roles of greater status and seniority (i.e., a 'career').

Despite the promising potential of job crafting for employee well-being, a scarcity of research has empirically explored this relationship, and it thus remains an untested theoretical hypothesis. Tims et al. (2012) and Petrou et al. (2012) have made a keen start, yet this research is limited to engagement rather than broader employee well-being outcomes. Should a positive association between job crafting and employee well-being become established, researchers will have preliminary grounds upon which they can design job crafting interventions and enhance their efficacy in enhancing employee wellness. The relationships between other forms of proactive behaviours and organisational or individual performance (e.g., Grant, Parker, & Collins, 2009; Seibert, Kraimer, & Crant, 2001; Thompson, 2005; Van Scotter, Motowildo, & Cross, 2000) also provide evidence for the promising potential of job crafting activities to be associated with desirable workplace outcomes beyond well-being.

Importantly, however, not only is an explanation of the 'why' of job crafting important, but an exploration of the 'how' is equally important to extending theory and research. Understanding how job crafting works to enhance employee well-being will allow researchers to further explain the mechanisms that operate to boost well-being, and hence provide direction for more targeted and creative interventions. Due to the lack of empirical research on job crafting activities at work until recently, there is at present no underlying motivational theory that explains how it is able to affect work outcomes. One possible answer to this gap lies in exploring the relationship between job crafting and inherent psychological needs.

Job Crafting, Self Determination, and Well-Being

Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2000) suggests the existence of universal psychological needs, that when satisfied, lead to optimal functioning and psychological adjustment. Namely, these are the needs for autonomy, competence, and relatedness. *Autonomy* requires the experience of choice and being the initiator of one's own behaviour. *Competence* requires succeeding at challenging tasks and ultimately attaining desired outcomes. *Relatedness* requires a sense of caring, mutual respect, and mutual reliance with others. The extent to which the three needs are satisfied in the workplace determines the level of well-being that employees experience. Ryan and Deci (2000) specify these necessary psychological nutrients for ongoing psychological growth, health, and well-being, and their satisfaction is suggested to be associated with optimal functioning, eudaimonia, and integrity. Indeed several studies have supported this implicit theoretical assumption: need satisfaction is an important antecedent to well-being (e.g., Howell et al., 2011; Illardi, Leone, Kasser, & Ryan, 1993; Reis et al., 2000; Sheldon & Elliot, 1999; Sheldon, Ryan, & Reis, 1996).

Other research has examined ways in which need satisfaction can be enhanced. Contextual variables such as autonomy support appear important for need satisfaction (Baard et al., 2004; Deci et al., 2001). Similarly, behavioural variables such as setting self-concordant goals (i.e., goals consistent with one's intrinsic values and interests; Sheldon & Elliot, 1999), and using one's character strengths (e.g., Linley et al., 2010) have been shown to facilitate need satisfaction. However, beyond these lines of research there are few studies that have examined behavioural antecedents to the three needs. There are even fewer studies exploring these antecedents in work settings or in working samples. Hence, an empirical exploration of job crafting and its relationship to employee intrinsic needs may help unearth other methods by which well-being can be enhanced.

Of particular relevance to SDT, Wrzesniewski and Dutton (2001) argued that individuals who craft their job do so to maintain control over their work, to create a positive self-image for themselves in their work, and to connect with others in the workplace. This motivation to engage in job crafting aligns closely with the three SDT needs for autonomy, competence, and relatedness, respectively. For example, task crafting requires a sense of control over one's work and will also enhance the perception of personal control one has over their work. It is likely that such experiences will facilitate the satisfaction of the need for autonomy. Cognitive crafting allows employees to reframe their work cognitions so as to create a more constructive self-image of themselves at work. It will enhance the awareness and appreciation that employees have for the potential value of their work for the organisation, the community, and their lives. These experiences, in turn, will likely facilitate the need for competence. Relational crafting will influence the degree to which employees connect with others at work and therefore their ability to create positive, sustainable relationships. Hence, relational crafting aligns with the need for relatedness. In sum, the three SDT needs offer a sound explanation of *how* job crafting is likely to enhance well-being.

Aim and Hypothesised Model

In this study, job crafting among adult employees is examined. The purpose of this study is two-fold. First, we aim to explore the utility of job crafting for employees and thus explore the relationship between job crafting and employee well-being. Here the operationalisation of job crafting is guided by the three component model offered by Wrzesniewski and Dutton (2001), which consists of the task, relational, and cognitive crafting dimensions. Cognitive crafting—a concept typically not addressed in previous job crafting measures—is a necessary inclusion to the empirical literature as crafting cognitions about work is an important way in which individuals can shape their work experience (Wrzesniewski & Dutton, 2001). Indeed,

it may help employees to appreciate the broader effects of their work and to recognise the value that their job may hold in their life. Hence, a measure developed specifically for this study that assesses the extent to which employees engage in all three forms of job crafting was used. This means that the measure used in the present study has several items devoted to each of these three dimensions of job crafting.

Tims et al. (2012) recently conducted some research using a generic scale of job crafting and organisational outcomes. Although these authors did not examine the specific relationship between job crafting and well-being, their results showed a negative relationship with employee cynicism and a positive relationship with engagement. Similarly, Petrou et al. (2012) recently used the same scale and found associations between some facets of job crafting and employee engagement, which provides preliminary support for a positive association between job crafting and employee well-being. Indeed, research examining broader and positive well-being outcomes is also needed. Hence, the present study will extend these findings by a) using a more comprehensive model of mental health that includes the operationalisation of both eudaimonic and hedonic well-being, and b) using a measure of job crafting that aligns with Wrzesniewski and Dutton's (2001) three component model that includes a cognitive dimension of crafting.

Second, at present there is no underlying motivational theory about how job crafting might lead to employee outcomes. Hence, the second aim of this study is to extend theory on job crafting by examining the underlying mechanisms by which it predicts employee outcomes. Implicit in the premise of SDT is that the satisfaction of the needs for autonomy, competence, and relatedness leads to an ongoing sense of growth, fulfilment, and well-being (Deci & Ryan, 2000). Hence, activities that aid the satisfaction of the three needs may result in an enhanced state of well-being, and, as argued, job crafting constitutes a form of activity that may lead to well-being through the satisfaction of these needs.

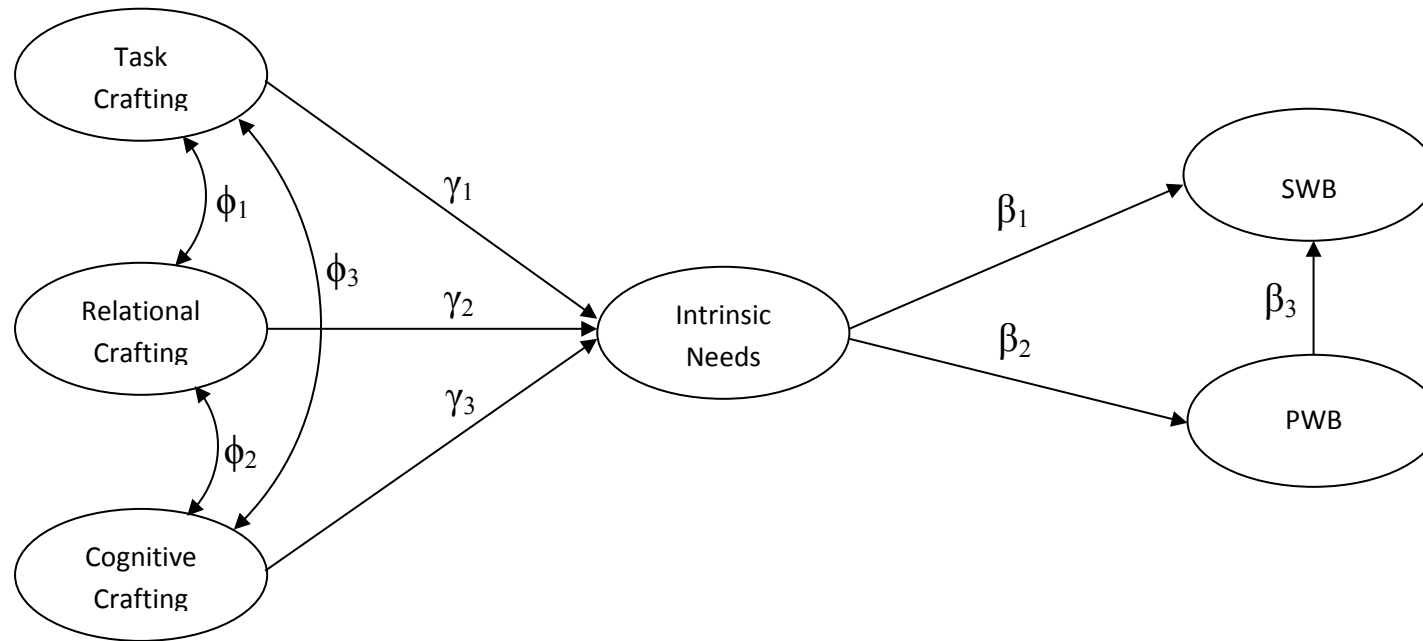


Figure 1. Hypothesised model showing the anticipated relations between job crafting, intrinsic need satisfaction, and well-being.

The hypothesised model is presented in Figure 1. As can be seen in this diagram, it is hypothesised that task, relational, and cognitive forms of job crafting will predict work related need satisfaction, which, in turn, will predict both SWB and PWB. Moreover, it is hypothesised that need satisfaction will exhibit both a direct relationship with SWB and an indirect relationship through PWB. This latter prediction is made due to the concept of PWB being rooted in eudaimonia, a life well lived, and optimal psychological functioning.

Whereas SWB has been considered an ideal state of happiness, PWB is one way in which humans express their virtues in order to attain that ideal, and hence, several authors have now made reference to the hedonic component of well-being (SWB) as a by-product or outcome of eudaimonic living (e.g., Ryan & Deci, 2001; Ryan, Huta, & Deci, 2008; Ryff, 1989; Ryff & Singer, 1998). Ryff and Singer (1998), for example, cite evidence that eudaimonic living, as represented by PWB, can lead to enhanced immunological functioning and health promotion, which itself is associated with the hedonic features of positive mood and stress relief. Similarly, Ryff and Keyes (1995) reported moderate to strong correlations between their assessment of PWB and happiness, life satisfaction, and depression. Hence, the increase in PWB is likely to accentuate the perception of a life well lived, and, in turn, subjective happiness.

Method

Participants

A total sample of 334 employees participated in the study. Of these, 253 (75.7%) provided complete data for all the measures required in the analysis. This group thus represented the sample used in the study. T-tests revealed that there were no mean differences with respect to any of the study variables between the complete and missing data sets (all p 's > .05), suggesting that the missing data were missing at random (Little & Rubin,

2002). More than half the participants were female (66.8%) and the mean age was 41.94 ($SD = 11.38$). The majority worked full-time (76.4%), and on average participants worked 38.02 hours per week. Most employees worked in a large Australian university (68.0%), or were working within the human resources departments within one of Australia's large banking and financial services firms (6.4%), and a large Australian healthcare organisation that offers health insurance products and services (6.0%). The university staff were employed within a range of departments, including administration, library services, human resources, and some academic staff. T-tests revealed that there were no differences on the study variables between these sample groups (all p 's $> .05$). The mean income was \$76,371 (AUD) per annum ($SD = \$52,454$), and the mean years of education was 17.60 ($SD = 3.56$).

Procedure

The majority of the sample was contacted through the company where they worked (86.6%), which included a large academic institution, a large Australian banking and finance company, and a large Australian health insurance company. In each case, an organisational representative sent out staff emails and/or newsletters inviting their staff to participate. Other participants were recruited through advertisements on online discussion forums and social networking sites. As an incentive, participants could choose to enter a draw to win an 8GB iPod touch as a result of completing the questionnaires. The email and newsletters contained a link to the study explanatory statement, which then directed participants to the questionnaires. It was made known to participants that they could choose not to participate and that their managers would never attain access to their responses. The set of questionnaires was counterbalanced to ensure that the order of presentation of each questionnaire was not the same for the entire sample.

Measures

Job crafting. The Job Crafting Questionnaire (JCQ; Slemp & Vella-Brodrick, 2012) was developed and validated to be used in this study. By drawing on a review of the extant literature and previous attempts to develop a job crafting measure, a list of 15 items were devised to assess ways in which employees engage in task, relational, and cognitive crafting: five items for each of task, relational, and cognitive crafting. One item for each of task and relational crafting were adapted from Leana, Appelbaum, and Shevchuk (2009), while the remainder of the items were original. Items represented a unique form of job crafting behaviour or cognition, and respondents were instructed to indicate the extent to which they engaged in each type of behaviour or cognition on a 6-point Likert scale from 1 (hardly ever) to 6 (very often). Sample items are as follows: for task crafting, “choose to take on additional tasks at work”; for relational crafting, “make an effort to get to know people well at work”; and for cognitive crafting, “think about how your job gives your life purpose”. The Cronbach’s alpha for the total job crafting scale was .91, and the subscales obtained Cronbach’s alpha values of .87, .83, and .89 for task, relational, and cognitive crafting, respectively. The 15 item scale is shown in Appendix A.

Slemp and Vella-Brodrick (2012) supported a three factor solution using exploratory and confirmatory factor analytic methods, showing the job crafting items to load independently and strongly on their respective factors. Moreover, the scale correlated positively with proactive employee behaviours (e.g., organisational citizenship behaviour, the extent to which employees use their strengths, and self-concordant goal setting), as well as job satisfaction. It also correlated negatively with work specific negative affect, supporting its validity.

Intrinsic need satisfaction at work. The Intrinsic Need Satisfaction Scale (Baard, Deci, & Ryan, 2004) was used to assess the extent to which employees' intrinsic needs for autonomy, competence, and relatedness were satisfied on the job. Consisting of 21 items, the questionnaire contained seven items for autonomy, six items for competence, and eight items for relatedness. Participants responded on a 7-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree). Sample items are as follows: for autonomy, "I feel like I can make a lot of inputs to deciding how my job gets done"; for competence, "People at work tell me I am good at what I do", and for relatedness, "I get along with people at work".

Composite scores were calculated for each need by creating a mean score for each participant for each need. These composite scores were then used as three observed variables for the latent variable *intrinsic need satisfaction at work*. The Cronbach's alpha for the total need satisfaction scale was .90. The Cronbach's alphas for autonomy, competence, and relatedness were .79, .87, and .74, respectively. Baard et al. (2004) also showed the measure correlates positively with psychological adjustment and work performance ratings, supporting its convergent validity.

Well-being. Well-being was measured with Keyes' (2007) Mental Health Continuum, which assesses positive emotions (SWB), positive psychological functioning (PWB), and positive social functioning (social well-being). This measure was selected as it offered a concise, yet valid and reliable way to investigate SWB and PWB simultaneously. Although the measure consists of the three subscales, only positive emotions and psychological functioning were used for the current study as this was consistent with the dual approach to well-being (e.g., Ryan & Deci, 2001) described earlier. Three items were used to assess SWB, and four out of the six original items were used to assess PWB. Two items were dropped to enhance the fit of the measurement model as recommended by the two-step

approach to structural equation modelling (Anderson & Gerbing, 1988), which is to first ensure each observed variable is satisfactorily related to its respective latent variable, and only after this step is the full structural model is tested. Participants were instructed to indicate how often they had experienced each feeling in the past month on a 6-point scale, from 1 (never) to 6 (everyday). Sample items are as follows: for SWB, “Interested in life”; and for PWB, “That you have experiences that challenge you to grow and become a better person”. The Cronbach’s alpha for the total scale was .89. The Cronbach’s alpha for the SWB and PWB components of the scale were .90 and .80, respectively. Keyes et al. (2008) used confirmatory factor analysis (CFA) to support a three-factor structure of SWB, PWB and social well-being. Keyes et al. also showed the scale correlated moderately strongly with positive affect (.52), and moderately with general self-efficacy (.39), satisfaction with life (.37), coping strategies (.34), sense of coherence (.32), and community collective self-efficacy (.30). It also correlated negatively with the symptoms of psychopathology (-.22), hence supporting its validity.

Overview of the Model Testing Approach

Structural equation modelling (SEM) methods were used for the data analysis. The hypothesised model was tested using AMOS 20 (Arbuckle, 2010), with maximum likelihood estimation. As SEM requires a complete data set for each case (Bryne, 2010), the recommendations of Graham (2009) were followed by using multiple imputation methods to estimate the missing values. Four cases had missing data on up to 12% of the items; the remainder of the participants had missing values on a very low number of items (0% to 2.2%).

SEM is most useful when analysing a relatively small set of variables. As the number of variables increases, the likelihood of finding an improper solution increases and the model is

unlikely to fit the data (Bentler & Chou, 1987; Harris & Schaubroeck, 1991). Accordingly, Bentler and Chou (1987) and Harris and Schaubroeck, (1991) recommend using up to about 20 observed variables. To reduce the number of observed variables in this study, the recommendations of Bagozzi and Heatherton (1994) were followed by calculating composite scores for the need satisfaction component of the model. These composite variables were used as the observed indicators for the need satisfaction latent variable. Moreover, to reduce the total number of job crafting items, we first ran a CFA and dropped the poorest loading indicator for each latent variable. This process reduced the number of observed variables in the analysis to 22 in total.

In order to test the fit of the hypothesised model, the two-step approach recommended by Anderson and Gerbing (1988) was followed. First, to confirm that the observed variables were satisfactorily related to their respective latent variables, CFAs were performed for the measurement model component of the analysis. In the CFA, the factor loadings of one observed variable for each latent variable was set to 1.0, which established the metric of the latent variables. Correlations were allowed between the pairs of latent variables shown in the structural model in Figure 1, and correlations between other variables were fixed to 0.0. Second, the fit of the structural model was tested. Path coefficients were determined for each of the hypothesised paths in the model, and the relations between other pairs of variables were set to 0.0.

Fit Indices

To test the fit of the measurement and structural models, six fit indices were used. The recommendations of Marsh, Balla, and Hau (1996) and Jaccard and Wan (1996) were followed by 1) using multiple fit indices, and 2) using fit indices across a range of different classes of fit indices. Hence, three relative goodness of fit indices were used, including the

non-normed fit index (NNFI; Tucker & Lewis, 1973), the Comparative Fit Index (CFI; Bentler, 1990), and the Incremental Fit Index (IFI; Bentler & Bonnet, 1980). The chi square statistic, the normed chi square, which is the chi square/ df ratio (χ^2/df), and the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993) were also used. Values above .90 for the NNFI and IFI (Byrne, 1994), as well as values above .93 for the CFI indicate a good fit (Hu & Bentler, 1992). The χ^2/df ratio provides an estimate of model fit that is less sensitive to sample size than the regular chi square value. Although there is no clear guideline for this statistic, values from as low as 2 (Ullman, 2007) to as high as 5 (Wheaton et al., 1977) have been recommended as indicating good fit. A value of 3 is another guideline (Bollen, 1989; Kline, 2005), and this was the criteria chosen for the present study to be consistent with previous job crafting research (e.g., Tims et al., 2012). The RMSEA takes into account the error of approximation in the population and tests how well the model would fit the population covariance matrix if it were available (Bryne, 2010). Values less than .08 indicate acceptable fit (Browne & Cudeck, 1993), and values greater than .10 should lead to model rejection (Cudeck & Browne, 1993; MacCallum, Browne, & Sugawara, 1996). Finally, a non-significant chi square statistic is indicative of good fit. However, this statistic tends to be affected by sample size and can therefore reject a good fitting model due to trivial differences between the correlations and the covariances in the observed and predicted matrices (Meyers, Gamst, & Guarino, 2006). Similarly, chi square is sensitive to the size of the correlations, with larger correlations generally leading to higher values of chi square (Kline, 2005). Hence, it is important to consider the chi square value in light of the other fit indices.

Results

Preliminary Analyses

The intercorrelations between the study variables are shown in Table 1. Composite scores were calculated for the variables by adding the items used in the scale and dividing them by the total number of items for that variable.

Table 1
Correlation matrix of the constructs used in the study

Construct	1	2	3	4	5	6	7	8	9
1. Task crafting									
2. Relational crafting	.52**								
3. Cognitive crafting	.64**	.53**							
4. TJC	.86**	.82**	.85**						
5. Need for autonomy	.54**	.31**	.44**	.51**					
6. Need for competence	.65**	.41**	.49**	.55**	.65**				
7. Need for relatedness	.32**	.51**	.45**	.45**	.56**	.52**			
8. TWNS	.52**	.48**	.49**	.59**	.87**	.83**	.83**		
9. SWB	.39**	.32**	.41**	.44**	.48**	.51**	.39**	.53**	
10. PWB	.43**	.49**	.40**	.52**	.37**	.45**	.42**	.49**	.68**

Note: TJC = Total Job Crafting, TWNS = Total Work Need Satisfaction, SWB = Subjective Well-Being, PWB = Psychological Well-Being;

* $p < .05$

** $p < .01$

As shown in Table 1, the 16 correlations between the job crafting variables and the need satisfaction (mediator) variables were highly significant. Similarly, the eight correlations between the job crafting variables and the well-being (outcome) variables were also significant. Finally, the correlations between the need satisfaction variables and the well-being variables were also significant. All correlations are in the expected (positive) direction. The pattern of correlations was therefore consistent with the hypothesised model depicted in Figure 1.

Several further analyses were conducted to determine whether any of the sample demographics were related to the variables in the model. Correlations revealed that neither years of formal education nor level of income were related to the variables in the model (all p 's $> .05$). Gender differences, however, were detected. T-tests revealed that female participants reported a statistically significant higher mean for relational crafting ($M = 3.89$) than male participants ($M = 3.35$), a higher mean for the satisfaction of the relatedness need ($M = 5.30$) than male participants ($M = 4.76$), and a higher mean for both PWB ($M = 4.48$) and SWB ($M = 4.65$) than male participants ($M = 4.16$ and $M = 4.25$ for PWB and SWB, respectively). Logistic regression also revealed that gender was significantly related to all relational crafting items, the relatedness composite variable, two SWB items (SWB items 1 and 3; all p 's $< .05$) and to two PWB items (PWB items 2 and 3; all p 's $< .05$). To acknowledge these relationships in the hypothesised structural model, gender was inserted as an antecedent observed variable with directional paths to the variables to which it is uniquely related. Hence, directional paths were drawn from gender to all relational crafting items, the relatedness need composite variable, as well as the SWB and PWB latent variables. These relationships can be observed in Figure 2.

The Hypothesised Model

First, CFA was used to test the measurement model. The CFA results indicated that although the chi square index was significant, on the whole the fit of the measurement model was good. Specifically, the chi square ($df = 204$) was 406.05 ($p < .001$), the χ^2/df was 1.99, the NNFI was .92, the IFI was .94, the CFI was .94, and the RMSEA was .06). Next, the full structural model shown in Figure 1 was tested, with the addition of a gender antecedent variable. Only the latent variables are shown in this diagram. Absence of an arrow connecting variables in the model implies a lack of a hypothesised direct effect. The fit statistics for the full structural model are shown in the top row of Table 2.

The hypothesised model was tested against seven alternative models. This procedure was followed to test whether job crafting was actually the optimum antecedent condition that is associated with the motivational mediation process—psychological need satisfaction—which, in turn, predicts well-being. A plausible alternative model, for example, could place need satisfaction as the antecedent (motivating) variable in the model – where psychological need satisfaction predicts job crafting activities, which, in turn, predict well-being. Yet another alternative model could place well-being as the antecedent variable. Hence, a model with three constructs can be tested in six different ways by interchanging the three constructs as antecedents, mediators, and outcome variables. If the hypothesised model were to fit the data better than these alternative models, it provides increased confidence that the ordering of the hypothesised interrelationships is correct. Moreover, as an empirical consensus about whether PWB actually leads to SWB has not yet been reached, we tested the hypothesised model against another alternative model (M6_{alternative}) with no specified relationship between PWB and SWB. Finally, the hypothesised model was tested against the null model, which assumes that all the observed variables in the model—and hence all the latent variables—are

uncorrelated (Byrne, 2010). Table 2 shows the hypothesised model compared to the alternative models.

Table 2

The SEM fit indices of the hypothesised model against the alternative models and the null model

Model	χ^2	<i>df</i>	χ^2/df	NNFI	IFI	CFI	RMSEA
Hypothesised model	438.22***	215	2.04	.92	.93	.93	.06
JC to WB to Needs	457.50***	212	2.16	.91	.93	.92	.07
Needs to JC to WB	477.66***	214	2.23	.90	.92	.92	.07
Needs to WB to JC	481.80***	217	2.22	.90	.92	.92	.07
WB to Needs to JC	470.26***	220	2.14	.91	.92	.92	.07
WB to JC to Needs	506.01***	216	2.34	.90	.91	.91	.07
M6 _{alternative}	504.13***	216	2.33	.90	.91	.91	.07
Null	3476.45***	253	13.74	-	-	-	.22

Note: χ^2 = Chi square, χ^2/df = normed chi square, NNFI = Non normed fit index, IFI = Incremental fit index, CFI = Comparative fit index, RMSEA = Root mean square error of approximation, JC = Job Crafting, WB = Well-Being, Needs = Psychological Need Satisfaction.

* $p < .05$

** $p < .01$

*** $p < .001$

As can be observed in Table 2, although the chi-square statistic was significant, on the whole the fit of the hypothesised structural model was good. The NNFI and IFI were both above the criterion values of .90, and the CFI was above .93. The χ^2/df ratio was less than 3, and the RMSEA was less than .08. Table 2 also shows that although the alternative models generally provided a reasonable fit to the data, the hypothesised model fit the data better on every fit index. The only exception was the IFI, which indicated a level of fit to the data that was either equivalent or superior to the alternative models. Moreover, the hypothesised model fit the data substantially better than the null model. Taken together, these results offer support for the hypothesised relationships predicted in the model. Importantly, these fit statistics were produced without the need for model respecification. The modification indices suggested that some error terms could be co-varied to enhance the model fit, however, as there was no robust theoretical rationale for correlating the error terms in this analysis, an *a priori* decision was made not to use this approach to enhance the model fit.

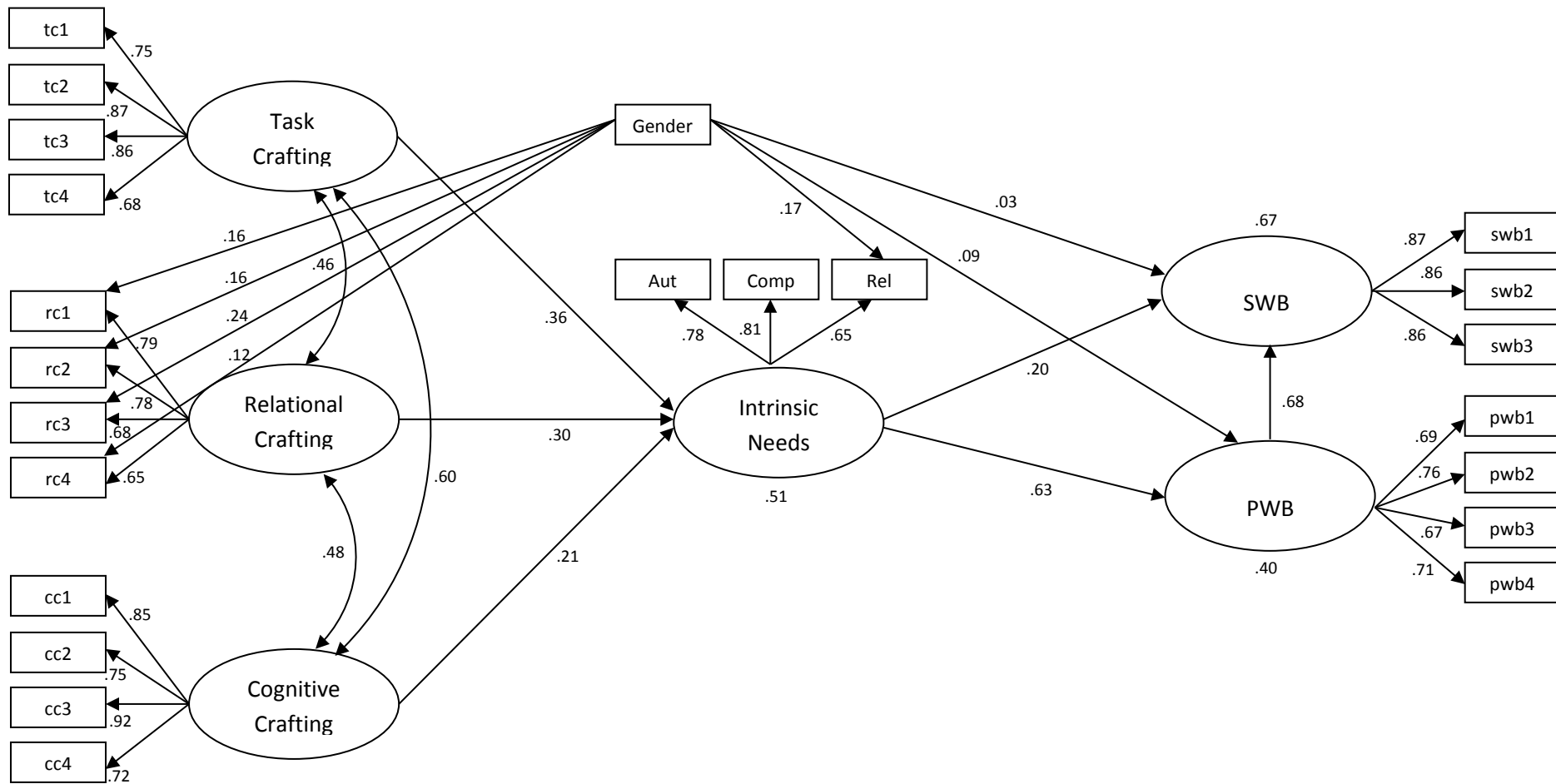


Figure 2. Standardised parameter estimates for the full structural model using AMOS.

Note: Measurement error terms are not shown. All path and measurement coefficients are significant at $p < .001$, except the paths from cognitive crafting to intrinsic needs ($p < .01$), Gender to rc4 ($p < .05$), and Gender to PWB and SWB (both p 's $> .05$); Chi square = 438.22 ($p < .001$), $\chi^2/df = 2.04$, non-normed fit index = .92, incremental fit index = .93, comparative fit index = .93, and root mean square error of approximation = .06; Aut = Autonomy, Comp = Competence, Rel = Relatedness, SWB = Subjective Well-Being, PWB = Psychological Well-Being.

Figure 2 presents the full structural model deemed to fit the data. Ovals represent latent variables and rectangles represent observed variables. An inspection of the direct effects shows that task crafting had the strongest relationship with need satisfaction (.36), followed by relational crafting (.30) and cognitive crafting (.21). Intrinsic need satisfaction had the strongest relationship with PWB (.63) and had a weak to moderate correlation with SWB (.20). The direct relationship between PWB and SWB was strong (.68). All relationships were statistically significant at $p < .001$, except the path between cognitive crafting and intrinsic need satisfaction, which reached significance at the $p < .01$ level.

Gender exhibited weak to moderate relationships with the relational crafting observed variables (from .12 to .24), weak relationships with the relatedness composite variable (.17), and weak relationships with PWB (.09) and SWB (.03). All of these paths are significant at $p < .001$, except for Gender to rc4 ($p < .05$), and Gender to PWB and SWB both failed to reach statistical significance (p 's $> .05$).

The effect of intervening variables was examined using the standardised indirect effects matrices. Cognitive crafting exhibited indirect effects on PWB and SWB through need satisfaction (both .13). Relational crafting exhibited indirect effects on PWB and SWB through need satisfaction (both .19). Task crafting also exhibited indirect effects on PWB and SWB through need satisfaction (.23 and .22 for PWB and SWB respectively). Also of interest here was the indirect effect of need satisfaction on SWB, through PWB. The matrices showed that need satisfaction predicted SWB through PWB (.43), which is moderately strong. These indirect effects statistics support the intervening variables in the model by showing that increases in the antecedent variables are associated with corresponding increases the outcome variables, through increases in an indirect, mediating variable.

Overall, the analyses indicated that the data fit the model well. Task, relational, and cognitive forms of job crafting predicted intrinsic need satisfaction, which, in turn, predicted SWB and PWB. Moreover, need satisfaction predicted SWB both directly and through changes in PWB.

Discussion

There has been a dearth of empirical research seeking to understand the relationships between individual outcomes and job crafting in organisations, and hence little research into the theoretical mechanisms that underlie these relationships. The aim of the present study was to address this gap by testing a model of job crafting, self-determination, and employee well-being in work organisations. Specifically, it was hypothesised that job crafting would predict psychological need satisfaction, which, in turn, would predict employee well-being.

The data revealed that the hypothesised structural model fit the data well in a sample of working adults, even without the need for model re-specification. Moreover, the hypothesised model fit the data better than all of the alternative models. This indicates that the extent to which employees engaged in job crafting predicted the extent to which their psychological needs were satisfied on the job, which, in turn, predicted their level of SWB and PWB. Also as predicted, SWB was enhanced both directly through the three needs and indirectly through changes in PWB. This supports the arguments of, for example, Ryan and Deci (2001; Ryan, Huta, & Deci, 2008; Ryff, 1989; Ryff & Singer, 1998) that eudaimonic living, as represented by PWB, affects the pleasurable, hedonic component of well-being through strivings toward optimal functioning, self-actualisation and, more broadly, a life well lived. The present study thus suggests that although the pursuit of positive functioning is sometimes not pleasurable in itself, it ultimately results in enhanced meaning and fulfilment, and hence predicts an enhanced state of subjective well-being.

The results of this study should be interpreted in light of some limitations. First, the sample was relatively homogenous in terms of education, nationality, and income. This is probably because most participants worked in the white collar sector in Australia where the average salary and level of education are typically higher than the blue collar sector or public service. Hence, the mean income and level of education of the participants was higher than the average found in most industrialised societies. This impedes the external validity of the findings to more diverse groups of workers, such as those in the traditional blue collar sector and those from other cultures. Moreover, the measures were circulated primarily throughout the human resources departments in two of the three organisations (accounting for 12.4% of the total sample) – a sector that generally attracts and contains higher numbers of female than male employees (Pichler, Simpson, & Stroh, 2008; Sayce, 2012). Females also generally respond with greater frequency to survey research (Gosling et al., 2004), which may account for the higher number of females in the present study.

Second, the sample, although large enough to use SEM methods for the analysis, was not large enough to conduct an invariance test on a separate sample of participants. An invariance test would help to determine whether the model is sustainable across the wider adult working population. One further avenue for potential research would be to test the invariance of the model against working adults from a different culture. There is a body of research to suggest that the intrinsic needs are universal across cultures (e.g., Deci et al., 2001; Deci & Ryan, 2000; Sheldon, Abad, & Omoile, 2009; Sheldon, Elliot, Kim, & Kasser, 2001; Vansteenkiste, Lens, Soenens, & Luyckz, 2006), however, it remains unknown whether the relatively individual act of crafting ones work will predict need satisfaction, and, in turn, well-being in other cultures where work groups, dynamics, and expectations of employees are different to Australia. Although this would not confirm the universal

significance of the model, it would provide valuable evidence of its generalisability beyond the work culture in corporate Australia.

Third, the job crafting measure used in this analysis is in the early stages of development and only preliminary tests of its construct validity have been conducted. Nonetheless, preliminary testing has shown promising results for the measure's internal consistency, as well as its factor structure, convergent, and discriminant validity (Slemp & Vella-Brodrick, 2012).

Fourth, there is the problem of shared method variance – variance attributed to the measurement method rather than the constructs the measures represent (Podsakoff, Mackenzie, & Podsakoff, 2003). Although the order of presentation of questionnaires was counterbalanced in this study to reduce this problem, future research could go a step further by using a different methodology, such as the multitrait-multimethod approach, or to statistically control for it directly.

Fifth, the data here are cross-sectional and hence do not allow for inferences to be made about job crafting behaviours over time. It is possible, for example, that the accumulation of job crafting experiences over time will exhibit stronger relationships with employee needs and well-being. We were not able to test this longitudinal hypothesis with our cross-sectional data and future research should examine the effect of job crafting over time to address this gap. Finally, the outcome measure used in this study consists solely of well-being, which is a subjective measure. Future research would benefit from the analysis of objective measures in their research that are indicative of well-being or performance, such as absenteeism or turnover.

Despite these limitations, the present study furthers job crafting research in two important ways. First, the data established an association between job crafting activities and the important employee outcome of employee well-being. Other than the work of Tims et al. (2012) and Petrou et al. (2012), previous research on job crafting lacked an empirical basis, and the effect of job crafting activities for employees remained nothing more than theoretical predictions. The data here shows empirically that the extent to which employees craft their jobs predicts indices of well-being. Lyubomirsky, Sheldon, and Schade's (2005) 'architecture of sustainable change' model purports that well-being is governed by three important antecedents: genetics and heritability, life circumstances, and intentional activities, which account for 50%, 10%, and 40% of the variance in well-being, respectively. The present study suggests that job crafting represents another form of intentional activity that people can adopt to improve their well-being. In contrast to the intentional activities identified by Lyubomirsky et al., however, job crafting is more specific to the workplace and thus constitutes a unique form of activity that people can use in a work specific setting to potentially improve their well-being.

The second way the present study extends job crafting research is by identifying that job crafting activities predict changes in employee well-being through changes in satisfying intrinsic human needs; needs purported to be universal to all humans (Deci et al., 2001; Deci & Ryan, 2000; Sheldon, Abad, & Omoile, 2009). This suggests that job crafting allows employees to internalise their work behaviours so as to form a congruence between their work-related activities and their intrinsic desires, interests, and values. Hence, job crafting allows employees to shape their work experience within the boundaries of their jobs to increase their enjoyment or satisfaction, connect with more people at work, and to appreciate the effect their work is having on the success of the organisation, community, or society.

These experiences align closely with the needs for autonomy, relatedness, and competence, respectively. The present study supports these relationships by showing that the extent to which employees engage in job crafting predicts the extent to which their intrinsic needs are satisfied at work.

The present study also supports research showing need satisfaction to be related to well-being (e.g., Illardi, Leone, Kasser, & Ryan, 1993; Reis et al., 2000; Sheldon & Elliot, 1999; Sheldon, Ryan, & Reis, 1996). However, this study extends this research by also including a measure of PWB, which has been largely neglected in the operationalisation of well-being in prior empirical research, particularly in work contexts. Moreover, the relationships obtained here show that need satisfaction is more strongly related to PWB than SWB. This makes sense given that PWB is concerned with strivings towards optimal functioning and self-actualisation, whereas SWB is concerned with the pursuit and attainment of happiness and pleasure. Need satisfaction, similarly to PWB, is concerned with the human trajectory toward vitality, integration, and health (Deci & Ryan, 1985, 2000). Insofar as one's intrinsic needs are satisfied, they will move towards these pursuits, and hence towards PWB. The model also shows that the extent to which one enhances their PWB will produce corresponding increases in SWB. Ultimately, by satisfying one's needs at work, one will move towards an enhanced state of mental health that is characterised by both positive functioning and happiness. Job crafting, as discussed, is one important way by which employees may satisfy their needs at work.

It should be noted that males and females responded differently to several variables under investigation. Namely, females reported higher levels of relational crafting, greater satisfaction of the need for relatedness, and higher SWB and PWB than male participants. However, neither path from gender to SWB or PWB was statistically significant when

considered in light of other relationships in the model using the standardised parameter estimates. Nonetheless, although hypotheses about the temporal sequencing of events cannot be tested with the present cross-sectional data set, it is possible that a direct consequence for the higher levels of relational crafting in females is a contributing factor to their increased satisfaction for their need for relatedness, and consequently, their heightened well-being. This is an interesting finding that warrants further examination using longitudinal methods, which may ultimately shed light on whether this possibility is correct.

In conclusion, the present study provides empirical evidence for a relationship between job crafting and employee mental health. More specifically, the results suggest that the extent to which employees engage in job crafting predicts the satisfaction of their intrinsic needs, which, in turn, predicts employee well-being. Job crafting, then, appears a promising concept upon which an intervention aimed at enhancing employee well-being could be based. Wellman and Spreitzer (2011) recently published an incubator article in the *Journal of Organizational Behavior* to encourage organisational scholars to use job crafting activities to enhance the meaning they attain from their work. A job crafting intervention could use a similar procedure, and hence focus on encouraging employees to think about the range of opportunities, techniques, and applications they might use to engage in job crafting activities at work. Given the regrettable state of the current global economic climate, such an intervention may provide employees with a welcome tool they can use to potentially enhance their mental health.

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7.0 CHAPTER 7
DISCUSSION AND CONCLUSIONS

Discussion and Conclusions

The main purpose of this thesis was to generate empirical insight into the construct of employee job crafting, with a particular emphasis on exploring its association with employee well-being. The lack of a suitable scale with which to measure job crafting meant that it was first necessary for a new job crafting scale to be developed. This was the first focus of the thesis, and a new, theory driven yet statistically sound measure on job crafting was developed and validated. Subsequently, the measure was used to examine the relationship between job crafting and employee well-being, with the added focus of examining the theoretical mechanisms that mediate this relationship. Hence, this thesis comprises some of the first empirical inquiries into employee job crafting and its relationship with important individual and organisational outcomes.

This chapter includes a discussion of the broader implications for the two empirical studies included within this dissertation, and integrates the findings with broader theory and previous literature. It will end with some suggestions for future research, as well as an overall conclusion.

The Contribution of a New Job Crafting Measure

The first component of this thesis was focused on the development and validation of the JCQ. This was necessary for two important reasons. First, an empirical measure of job crafting was necessary in order to complete the second study, which was focused on investigating the relationship between job crafting, employee intrinsic need satisfaction, and employee well-being. As stated throughout, previous measures of job crafting were not suitable as they were designed for highly specific target populations and therefore did not allow for the accurate measurement of *general* adult working populations. Similarly, the

Tims, Bakker, and Derks (2012) general JCS was not used because it does not allow for inquiry into the cognitive component of job crafting. It was also not available at the time the present studies were conceptualised and designed.

The second reason as to why it was necessary to develop a new scale on job crafting was to provide organisational scholars with a new and theoretically driven tool they can use to gauge the extent to which employees in general working contexts engage in job crafting activities. Hence, it opens empirical inquiry into the relationship between all three types of job crafting and other important individual and organisational outcomes, such as performance, retention, extra-role behaviours and well-being.

There is already some evidence to suggest that job crafting is associated with valued outcomes, such as enhanced performance. Leana, Appelbaum, and Shevchuk (2009), for example, investigated the relationship between job crafting, at both the individual and group level, with performance, job satisfaction, commitment, and turnover intentions across employees (i.e., teachers and childcare workers) in 62 childcare centres. These authors found that job crafting at the group level was significantly related to performance, particularly for less experienced teachers, as well as job satisfaction and commitment. Job crafting at the individual and group level was positively related with workplace autonomy, which the authors referred to as perceived discretion. This research provides some of the first insights into the practical utility of job crafting for both employees and organisations. The JCQ that was developed as a part of this dissertation will assist with generating similar insights into samples beyond those working in childcare or teaching, and as stated, will also allow for empirical inquiry into the cognitive dimension of job crafting – a component that offers practical insight into alternative pathways to enhance employee well-being.

Broader Implications for Individuals

The findings of this thesis suggest that job crafting is a method by which employees can enhance the experience of work, and, in turn, their PWB and SWB. The relationship between job crafting, need satisfaction, and PWB suggests that job crafting is a method by which employees can internalise and integrate their work behaviours so that they align with their intrinsic interests and values, and hence, enhance the sense of personal meaning and fulfilment they attain from work. Similarly, the positive, albeit weaker, relationship with SWB suggests that job crafting is a way in which employees enhance the pleasure and satisfaction that they derive from work, likely by shaping the tasks, relationships, or work cognitions to suit their individual work style, needs, or values. Together, the hedonic and eudaimonic components of mental health reflect the ideal state of optimal functioning and employee flourishing. This dissertation suggests, then, that job crafting is a practical, work-specific, and effective process that employees can use to move toward this ideal state of flourishing by enhancing both the meaning and enjoyment that they attain from their work.

Both theory and evidence suggest that enhancing employee well-being may result in a range of broader life outcomes for individuals due to a ‘spillover’ effect. Spillover Theory (Staines, 1980; Zedeck, 1992) posits that satisfaction in one domain of life varies as a function of the level of satisfaction in another. For example, satisfaction in one’s work life may influence one’s satisfaction in other domains such as family, social, leisure, or finance due to work demands (e.g., shift work, travel, overtime) creating demands that place limits on the amount of time and energy one can invest in other domains. This process inevitably produces lower satisfaction in areas to which less attention has been paid. Spillover Theory has received empirical support in the literature. For example, research has generally found a reciprocal relationship between job satisfaction and life satisfaction (e.g., Judge & Watanabe,

1993; Lambert, 1990; Rain, Lane, & Steiner, 1991; Sirgy et al., 2001). Kosseck and Ozeki (1998) conducted a meta-analysis on the relationship between work-family conflict, job satisfaction, and life satisfaction. Their results showed a consistent negative relationship between work-family conflict and job-satisfaction ($\rho = -.31$) and life satisfaction ($\rho = -.36$). These findings show how experiences in one domain (e.g., work-family conflict) can spillover into another domain (e.g., one's general life satisfaction).

Based on Spillover Theory, it is reasonable to suggest that enhancing employee well-being will have a positive 'spillover' effect into broader life domains, an assumption that is supported by empirical evidence. First, there is strong evidence to suggest that high well-being is associated with enhanced physical well-being, health and longevity. Cross-sectional research (see Diener & Chan, 2011; Lyubomirsky, King, & Diener, 2005 for a review) shows strong evidence for a correlation between SWB and physical health. Moreover, meta-analyses of longitudinal studies (e.g., Howell, Kern, & Lyubomirsky, 2007; Lyubomirsky, King, & Diener, 2005) indicate that well-being *leads to* these positive physical health outcomes. Hence, an increase in the psychological experience of well-being is likely to result in an enhanced state of physical health and longevity. These findings have further implications for organisations, with recent research suggesting that physical health indices are positively associated with job performance and inversely associated with absenteeism (Merrill et al., 2013).

Meta-analyses also support other individual life benefits from enhanced well-being. Lyubomirsky et al.'s (2005) meta-analysis summarizes the results of happiness studies across a broad range of possible outcomes. Their results suggest that well-being leads to positive outcomes across a range of life domains, including higher income, increased social support and friendships, as well as an increase in the likelihood of getting married. Moreover, happy

individuals are less likely to suffer from mental health symptoms or disorders, are less likely to experience sustained periods of unemployment, and are more likely to have a greater degree of autonomy, meaning, and variety in their work. Such findings are evidence for the broader benefits of well-being for individuals. Hence, unearthing unique and practical ways to enhance employee well-being at work is an important and worthwhile goal to potentially enhance the broader life outcomes for employees, and ultimately, enhance the global sense of satisfaction, enjoyment, and fulfilment that people attain from their lives. Although the responsibility to make these changes rests largely with employees, support from management and the broader organisation will facilitate this process more efficiently. For example, management can put in place the right systems, frameworks, and programs to support employees' ability to engage in these potential well-being enhancing activities. The literature on the relationship between healthy and happy employees and employee productivity (Cropanzano & Wright, 2001; Wright & Cropanzano, 2000, 2007) also attests to the potential benefits for organisations.

Broader Implications for Organisations

The implications of enhanced employee well-being for organisations is less obvious, but nonetheless important for the successful operation and performance of organisations today. Indeed several scholars acknowledge the role of employee well-being for the bottom-line. The happy-productive worker thesis has generally received support from systematic review and meta-analytic studies over the last several decades (e.g., Cropanzano & Wright, 2001; Iaffaldano & Muchinsky, 1985; Judge et al., 2001; Petty, McGee, & Cavender, 1984), and indicates that the correlation between job satisfaction and employee productivity ranges from .17 to .31. Although these correlations range from small to moderate, it nonetheless suggests that enhancing employee wellness may have a corresponding impact on employee

performance and productivity. As well, had these studies measured the more complete construct of employee well-being (defined with both hedonic and eudaimonic components), it is likely that these relationships would be higher and additional variance would have been explained. Indeed the present findings suggest that the eudaimonic component of employee well-being is the strongest predictor of workplace behaviour, and hence, it represents a potentially more promising yet neglected area of research in the industrial and organisational psychology literature.

Conceptual evidence suggests a range of further benefits of improving employee well-being for organisations. A workplace where employees are high in PWB and SWB will increase the frequency and intensity of the experience of positive emotions at work. Fredrickson's Broaden and Build Theory (Fredrickson, 1998, 2001, 2003a, 2003b; Fredrickson & Cohn, 2008) would suggest that these experiences, in turn, potentially increase individual and organisational performance through an upward spiral effect that enhances other commercially valuable outcomes in individuals.

This thesis shows that job crafting activities predict employee well-being through the satisfaction of the three intrinsic needs for autonomy, competence, and relatedness. With targeted interventions that focus on increasing the intensity and salience of need satisfying experiences in employees, organisations may benefit from not only enhancing the mental health and happiness of their workforce, but may engender a range of additional positive consequences, such as increased levels of employee resilience, creativity, and problem solving. Indeed, previous literature on Broaden and Build Theory suggests that positive emotions elicit these similar positive experiences. Two decades of research dominated by Isen and colleagues (Fredrickson, 2003a; for a review, see Fredrickson, 2001; 2003b) attest to a range of positive outcomes that result from the experience of positive emotions. Earlier

research showed, for example, that positive emotions are related to unique and diverse thought patterns which aid creativity. Similarly, Isen et al. (1985) used word associations to induce positive affect in participants and found that participants were able to generate more unusual and diverse word associations with words that were affectively valenced and positive. Similarly, by showing participants a few minutes of comedy film or providing them with a small bag of candy to induce positive affect, Isen, Daubman, and Nowicki (1987) enhanced performance on tasks that required creative ingenuity. Further studies supported the enhancing effect of positive emotions on problem solving (Isen, Rosenzweig, & Young, 1991). More recent research has also shown that the experience of positive emotions speeds recovery from negative emotional arousal (Fredrickson & Levenson, 1998), predicts increases in resilience and life-satisfaction (Cohn et al., 2009), and predicts broad-minded coping (Fredrickson & Joiner, 2002).

The Broaden and Build literature bodes well for the benefits of job crafting for organisations. Ultimately, job crafting is a promising means by which employees can internalise their work experiences and, in turn, potentially enhance their experience of work. The Broaden and Build research suggests that the extent to which employees engage in job crafting may therefore affect the extent to which organisations benefit from the positive correlates of employee well-being, such as enhanced creativity, problem solving, workplace relations, and resilience. It is plausible to expect, then, that job crafting activities will result in these further positive outcomes that will enhance the performance and financial success of organisations.

Future Research

Although the new JCQ provides another research tool that aligns with a specific conceptual perspective and may provide additional insight to previous measures on the

concept of job crafting, this is only a small addition to a growing literature. Future research should continue to explore the validity of the JCQ in different employee populations, countries, and across larger samples. The participants in this dissertation—although recruited across several organisations—were highly educated and primarily from a white-collar, corporate background. This limits the generalisability of the findings to similar population groups. Hence, exploring the validity of the JCQ in more diverse employee populations would provide increased confidence in the validity of the JCQ, and would also provide valuable insights about whether job crafting activities hold similar relationships with employee well-being in cultures and contexts beyond corporate Australia.

Future research should also use this new measure to explore the range of possible outcome variables to which job crafting may be correlated. First, it is necessary to explore the relationship between the three dimensions of job crafting and a range of different outcome variables that have tangible commercial value for organisations and thus arouse interest in managers, business and other commercial practitioners. This includes, but is not limited to, variables such as employee, team, and organisational performance, organisational commitment, employee retention, absenteeism, presenteeism, intention to turnover and actual turnover. Based on the data reported in this dissertation, as well as the data available from previous job crafting measures (e.g., Leana et al., 2009; Petrou et al., 2012; Tims et al., 2012), it is expected that the three types of job crafting will predict these important outcomes. If so, practitioners will be in a stronger position to communicate the potential value of job crafting interventions to enhance organisational performance, which will have further positive ramifications for employee well-being. Future research should also extend beyond self-report data and include objective occupational data, such as actual performance data, absenteeism, or turnover statistics. Should a relationship be found between job crafting and

these more concrete indicators, it would provide increased confidence supporting its efficacy as a means to enhance these employee outcomes. In addition, beyond conventional cross-sectional data, an interesting avenue for future research on job crafting would be to explore these relationships using an ‘in the moment’ sampling methodology, such as the experience sampling method (ESM; Larson & Csikszentmihalyi, 1983) – a research method that requests participants to respond to a series of questions at random points of the day as prompted. Using ESM, employees could at various times throughout the day register their job crafting activities and record data about whether these activities impact important employee outcomes and emotional states. Ultimately, this will provide a deeper level of insight into employees’ psychological response to job crafting that cuts across their immediate and global experience of work.

Second, it is important to explore the plausibility, effectiveness, and suitability of specific types of job crafting activities in particular jobs, occupational groups, or industries. It may be the case, for example, that people working in jobs that require the development of closer, more nurturing relationships for successful performance may benefit more from the act of relational crafting than they would from either task or cognitive crafting. By engaging in relational crafting, these employees may be able to attain a heightened sense of closeness with others by developing more meaningful and positive relationships, an opportunity that would be less abundant in occupations where individuals work in more isolated settings.

Third, another important area of future research is to design and test a job crafting intervention based on the three types of job crafting activities identified by Wrzesniewski and Dutton (2001). Although this dissertation showed job crafting to predict need satisfaction, and in turn, employee well-being; the cross-sectional nature of the research restrains the ability to infer causality. It is therefore inappropriate, based on this evidence, to suggest that

job crafting causes need satisfaction, which in turn, causes employee well-being. It is possible that other mechanisms are able to explain the variations in employee well-being as a function of job crafting and employee needs. For example, it is possible that job crafters tend to be more prosocial in the workplace, and hence receive from their colleagues elevated levels of support and assistance in return, which could result in enhanced need satisfaction and well-being. Such an explanation cannot be ruled out with cross-sectional data. An experimental design with random sampling is the only way in which causality can be inferred and confirmed, and should be a focus of future job crafting research. A causal association between job crafting and employee well-being will provide another important incentive and strong evidence for the design and implementation of broader job crafting interventions aimed at enhancing employee well-being.

An intervention study may also generate insight about the most effective methods to use in the design and delivery of workplace well-being interventions based on employee job crafting. Interventions can potentially use a range of different activities to increase the frequency and salience of job crafting at work. One possible method may be to invite employees to think about novel ways to integrate job crafting activities into their existing daily activities. Employees could, for example, place greater emphasis on those tasks that they consider most enjoyable or meaningful at work, or those tasks which allow them to leverage their strengths. Similarly, a highly sociable employee may strive to participate in more team-based projects or increase the opportunity to interact with other people in the workplace. Yet another way job crafting interventions could be designed is to raise consciousness of the *current* activities in which employees participate at work that would constitute some form of job crafting. Many employees are likely to engage in some form of job crafting activities at work already, and given the positive relationships between job

crafting and employee well-being provided in this dissertation, increasing the salience of these activities for employees may aid their ability to satisfy their intrinsic needs and, in turn, their well-being. Although these forms of interventions could be facilitated with a form of group based training program, individual training or coaching may also prove effective. Indeed scholars have intuitively offered Self-Determination Theory as a useful framework to guide coaching practice (e.g., Spence & Oades, 2011), and the findings that have emerged in this dissertation suggest that there is utility in this approach. Ultimately, both group-based and individual forms of intervention could shed light on the effective methods to enhance employee mental health and wellness.

Conclusion

The primary role of this dissertation was to generate empirical insight into the construct of employee job crafting, with a particular emphasis on exploring its relationship with employee well-being. At a broader level, this dissertation also sought to contribute to the field of positive psychology and therefore seek to redress the historical focus on employee problems and deficiencies, and alternatively, provide insight into new and innovative approaches that employees can use to function optimally and flourish in the workplace. The data presented here suggests that job crafting may be a useful method by which employees can achieve this objective. The studies presented here suggest that job crafting is a method by which employees can internalise their work tasks so that they align with their intrinsic needs for autonomy, competence, and relatedness, which, in turn, predicts the meaning and fulfilment (i.e., PWB) as well as the enjoyment and satisfaction (i.e., SWB) that they derive from their work.

Today's organisations need to develop innovative ways to create and sustain a competitive advantage. Given the relationships between employee performance and

employee well-being (e.g., Wright & Cropanzano, 2000; Wright, Cropanzano, & Bonnet, 2007; Wright & Staw, 1999) as well as the Broaden and Build evidence which highlights the broader positive implications of enhancing employee well-being at work, it makes sense that looking for ways to enhance employee well-being will likely benefit organisations. Moreover, given the broader mental health outcomes that are influenced by work factors (e.g., Kelloway & Barling, 1991; Lyubomirsky et al., 2005), there is a fundamental ethical imperative to ensure employees are both happy and healthy at work. Taken together, the findings of this thesis present some of the first empirical insights into employee job crafting and indeed suggest that it represents a promising underpinning for interventions aimed at achieving sustainable increases in employee well-being.

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Appendix A

The Job Crafting Questionnaire (JCQ)

Employees are frequently presented with opportunities to make their work more engaging and fulfilling. These opportunities might be as simple as making subtle changes to your work tasks to increase your enjoyment, creating opportunities to connect with more people at work, or simply trying to view your job in a new way to make it more purposeful. While some jobs will provide more of these opportunities than others, there will be situations in all jobs where one can make subtle changes to make it more engaging and fulfilling.

Please indicate the extent to which you engage in the following behaviours using the following scale: 1 = Hardly Ever, to 6 = Very Often. (Note: 'Very Often' means as often as possible in your workplace)

1. Introduce new approaches to improve your work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

2. Change the scope or types of tasks that you complete at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

3. Introduce new work tasks that better suit your skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

4. Choose to take on additional tasks at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

5. Give preference to work tasks that suit your skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

6. Think about how your job gives your life purpose

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

7. Remind yourself about the significance your work has for the success of the organisation

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

8. Remind yourself of the importance of your work for the broader community

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

9. Think about the ways in which your work positively impacts your life

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

10. Reflect on the role your job has for your overall well-being

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

11. Make an effort to get to know people well at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

12. Organise or attend work related social functions

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

13. Organise special events in the workplace (e.g., celebrating a co-worker's birthday)

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

14. Choose to mentor new employees (officially or unofficially)

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

15. Make friends with people at work who have similar skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

Note: Items 1 to 5 reflect task crafting, items 5 to 10 reflect cognitive crafting, and items 11 to 15 reflect relational crafting.

Appendix B

Job Crafting Questionnaire Original Item Bank

Employees are frequently presented with opportunities to make their work more engaging and fulfilling. These opportunities might be as simple as making subtle changes to your work tasks to increase your enjoyment, creating opportunities to connect with more people at work, or simply trying to view your job in a new way to make it more purposeful. While some jobs will provide more of these opportunities than others, there will be situations in all jobs where one can make subtle changes to make it more engaging and fulfilling.

Please indicate the extent to which you engage in the following behaviours using the following scale: 1 = Hardly Ever, to 6 = Very Often. (Note: 'Very Often' means as often as possible in your workplace)

1. Take on additional tasks at work to attain a greater wealth of experience

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

2. Change the scope or types of work tasks that you complete to increase your enjoyment or learning

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

3. Introduce new approaches at work to increase your enjoyment

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

4. Introduce new work tasks that you think better suit your skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

5. Give preference to work tasks that suit your skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

6. Change the way you do your job to make it more enjoyable for yourself

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

7. Change minor procedures that you think are not productive

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

**8. Increase the quality of the relationships you have with co-workers,
customers, or clients**

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

9. Create additional relationships with co-workers, customers, or clients

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

10. Engage in networking activities to establish more relationships

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

11. Make an effort to get to know people well at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

12. Organise or attend work related social functions

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

**13. Organise special events in the workplace (such as celebrating a co-worker's
birthday)**

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

**14. Make an effort to increase the number of people who you share your time
with at work**

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

15. Introduce yourself to co-workers, customers, or clients who you have not met

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

16. Choose to mentor new employees (officially or unofficially)

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

17. Make friends with people at work who have similar skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

18. Reflect on your job as a meaningful whole rather than a collection of separate tasks

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

19. Change the way you view your job to make it more meaningful for yourself

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

20. Try to understand the effect that your job has on the success of the organisation

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

21. Try to understand the significance of your work on the community

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

22. Think about how your job makes your life meaningful

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

23. Remind yourself about the significance your work has for the success of the organisation

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

24. Remind yourself of the importance of your work for the broader community

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

25. Think about the ways in which your work positively impacts your life

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

26. Reflect on the role your job has for your overall well-being

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

27. Think about how your job gives meaning to your life

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

Appendix C

Other Measures

Strengths Use Scale (Govindji & Linley, 2007)

The following set of questions ask you about your strengths, that is, the things that you are able to do well or do best.

Please list what you believe are your three biggest strengths. For example, if you believed your three biggest strengths were 'critical thinking', 'generosity', and 'friendliness', you would list them in the boxes below.

Everyone has different strengths, so be creative.

Strength 1:

Strength 2:

Strength 3:

The following questions concern the extent to which you *use* your strengths. Indicate the degree to which you agree with each statement using the following scale: **1 = Strongly Disagree, to 7 = Strongly Agree.**

1. I am regularly able to do what I do best

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

2. I always play to my strengths

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

3. I always try to use my strengths

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

4. I achieve what I want by using my strengths

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

5. I use my strengths everyday

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

6. I use my strengths to get what I want out of life

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

7. My work gives me lots of opportunities to use my strengths

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

8. My life presents me with lots of different ways to use my strengths

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

9. Using my strengths comes naturally to me

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

10. I find it easy to use my strengths in the things I do

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

11. I am able to use my strengths in lots of different situations

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

12. Most of my time is spent doing the things that I am good at doing

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

13. Using my strengths is something I am familiar with

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

14. I am able to use my strengths in lots of different ways

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

Govindji, R., & Linley, P. A. (2007). Strengths use, self-concordance and well-being: Implications for strengths coaching and coaching psychologists. *International Coaching Psychology Review*, 2, 143–153.

Intrinsic Goal Strivings (Work) (Emmons, 1986; Sheldon & Elliot, 1999)

We are interested in the things that you typically are trying to do and achieve in your everyday behaviour. Think about the objectives that you're trying to accomplish right now. We call these personal strivings.

For example, a student might have the following personal striving: "to get good grades this semester".

Please list a personal striving of your own, which is work related.

Goal:

People do things for many different reasons. Please rate why you think you're pursuing the personal striving you listed above, using the following scale: **1 = Not at all for this reason, to 7 = Completely for this reason.**

1. Because somebody else wants me to, or because my situation will force me to

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

2. Because I would feel ashamed, guilty, or anxious if I don't do it; I will force myself

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

3. Because I value and identify with doing it; I will do it freely even when it is not enjoyable

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

4. Because I will really enjoy doing it; I will find it to be interesting and challenging

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology*, 51, 1058–1068. doi: 10.1037/0022-3514.51.5.1058

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, 76, 482–497. doi: 10.1037/0022-3514.76.3.482

Intrinsic Goal Strivings (General life) (Emmons, 1986; Sheldon & Elliot, 1999)

Please list a personal striving of your own, which is related to your life in general.

Goal:

People do things for many different reasons. Please rate why you think you're pursuing the personal striving you listed above, using the following scale: **1 = Not at all for this reason, to 7 = Completely for this reason.**

1. Because somebody else wants me to, or because my situation will force me to

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

2. Because I would feel ashamed, guilty, or anxious if I don't do it; I will force myself

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

3. Because I value and identify with doing it; I will do it freely even when it is not enjoyable

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

4. Because I will really enjoy doing it; I will find it to be interesting and challenging

1 (not at all for this reason) 2 3 4 5 6 7 (Completely for this reason)

Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology*, *51*, 1058–1068. doi: 10.1037/0022-3514.51.5.1058

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, *76*, 482–497. doi: 10.1037/0022-3514.76.3.482

Intrinsic Need Satisfaction Scale (Baard, Deci, & Ryan, 2004)

The following questions concern your feelings about your job during the last year. (If you have been on this job for less than a year, this concerns the entire time you have been at this job.) Please indicate how true each of the following statements is for you given your experiences on this job. Remember that your boss will never know how you responded to the questions. Please use the following scale from **1 = not at all true**, to **7 = Very true**, in responding to the items.

1. I feel like I can make a lot of inputs to deciding how my job gets done

1 (not at all true) 2 3 4 5 6 7 (very true)

2. I really like the people I work with

1 (not at all true) 2 3 4 5 6 7 (very true)

3. I do not feel very competent when I am at work

1 (not at all true) 2 3 4 5 6 7 (very true)

4. People at work tell me I am good at what I do

1 (not at all true) 2 3 4 5 6 7 (very true)

5. I feel pressured at work

1 (not at all true) 2 3 4 5 6 7 (very true)

6. I get along with people at work

1 (not at all true) 2 3 4 5 6 7 (very true)

7. I pretty much keep to myself when I am at work

1 (not at all true) 2 3 4 5 6 7 (very true)

8. I am free to express my ideas and opinions on the job

1 (not at all true) 2 3 4 5 6 7 (very true)

9. I consider the people I work with to be my friends

1 (not at all true) 2 3 4 5 6 7 (very true)

10. I have been able to learn interesting new skills on my job

1 (not at all true) 2 3 4 5 6 7 (very true)

11. When I am at work, I have to do what I am told

1 (not at all true) 2 3 4 5 6 7 (very true)

12. Most days I feel a sense of accomplishment from working

1 (not at all true) 2 3 4 5 6 7 (very true)

13. My feelings are taken into consideration at work

1 (not at all true) 2 3 4 5 6 7 (very true)

14. On my job I do not get much of a chance to show how capable I am

1 (not at all true) 2 3 4 5 6 7 (very true)

15. People at work care about me

1 (not at all true) 2 3 4 5 6 7 (very true)

16. There are not many people at work that I am close to

1 (not at all true) 2 3 4 5 6 7 (very true)

17. I feel like I can pretty much be myself at work

1 (not at all true) 2 3 4 5 6 7 (very true)

18. The people I work with do not seem to like me much

1 (not at all true) 2 3 4 5 6 7 (very true)

19. When I am working I often do not feel very capable

1 (not at all true) 2 3 4 5 6 7 (very true)

20. There is not much opportunity for me to decide for myself how to go about my work

1 (not at all true) 2 3 4 5 6 7 (very true)

21. People at work are pretty friendly towards me

1 (not at all true) 2 3 4 5 6 7 (very true)

Baard, P. B., Deci, E. D., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34, 2045–2068. doi: 10.1111/j.1559-1816.2004.tb02690.x

Organisational Citizenship Behaviour (OCB) Scale (Podsakoff, Ahearne, & MacKenzie, 1997)

Please indicate how true the following statements are for you using the scale provided, **from 1 = Strongly Disagree, to 5 = Strongly Agree**. Think about each statement in relation to your job.

1. I help out others if they fall behind in their work

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

2. I willingly share my expertise with other members of the organisation

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

3. I try to act as a peacemaker when other employees have disagreements

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

4. I take steps to try to prevent problems with other employees

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

5. I willingly give my time to help other employees who have work-related problems

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

6. I “touch base” with other employees before initiating actions that might affect them

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

7. I encourage others when they are down

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

8. I provide constructive suggestions about how my organisation can improve its effectiveness

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

9. I am willing to risk disapproval to express my beliefs about what is best for my organisation

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

10. I attend and actively participate in team meetings

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

11. I always focus on what is wrong with a situation, rather than the positive side

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

12. I consume a lot of time complaining about trivial matters

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

13. I always find fault with what other employees are doing

1 (Strongly Disagree) 2 3 4 5 (Strongly Agree)

Podsakoff, P. M., Ahearne, M., & MacKenzie, S. B. (1997). Organizational Citizenship

Behavior and the quantity and quality of work group performance. *Journal of Applied*

Psychology, 82, 262–270. doi: 10.1037/0021-9010.82.2.262

Mental Health Continuum (Keyes, 2007; Keyes et al., 2008)

This questionnaire concerns your mental health. Please answer the following questions about how you have been feeling in the past month. Place a check mark in the box that best represents how often you have felt each feeling.

In the past month, how often did you feel...

1. Happy

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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2. Interested in life

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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3. Satisfied

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
-------	---------------	-------------------	---------------------	-----------------	----------

4. That you had something important to contribute to society

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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5. That you belonged to a community (like a social group, your neighbourhood, your city)

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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6. That our society is becoming a better place for people

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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7. That people are basically good

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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8. That the way our society works makes sense to you

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
-------	---------------	-------------------	---------------------	-----------------	----------

9. That you liked most parts of your personality

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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10. Good at managing the responsibilities of your daily life

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
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11. That you had warm and trusting relationships with others

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
-------	---------------	-------------------	---------------------	-----------------	----------

12. That you have experiences that challenge you to grow and become a better person

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
-------	---------------	-------------------	---------------------	-----------------	----------

13. Confident to think or express your own ideas and opinions

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
-------	---------------	-------------------	---------------------	-----------------	----------

14. That your life has a sense of direction or meaning to it

Never	Once or twice	About once a week	2 or 3 times a week	Almost everyday	Everyday
-------	---------------	-------------------	---------------------	-----------------	----------

Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, 62, 95–108. doi: 10.1037/0003-066X.62.2.95

Keyes, C. L. M., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., & van Rooy, S. (2008). Evaluation of the Mental Health Continuum – Short Form (MHC-SF) in Setswana-speaking South Africans. *Clinical Psychology & Psychotherapy*, 15, 181–192. doi: 10.1002/cpp.572

Affective Well-Being Scales (Warr, 1990)

Think about THE PAST FEW WEEKS, how much of the time has YOUR JOB made you feel each of the following?

1. Tense

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

2. Uneasy

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

3. Worried

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

4. Calm

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

5. Contented

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

6. Relaxed

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

7. Depressed

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

8. Gloomy

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

9. Miserable

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

10. Cheerful

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

11. Enthusiastic

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

12. Optimistic

Never	Occasionally	Some of the time	Much of the time	Most of the time	All of the time
-------	--------------	------------------	------------------	------------------	-----------------

Warr, P. (1990). The measurement of well-being and other aspects of mental health. *Journal of Occupational Psychology*, 63, 193–210. doi: 10.1111/j.2044-8325.1990.tb00521.x

Michigan Organizational Assessment Questionnaire (Cammann et al., 1979)

We are interested in how you would rate your overall level of job satisfaction. Please indicate the extent to which you agree with the following statements from **1 = Strongly Disagree**, to **7 = Strongly Agree**.

1. All in all, I am very satisfied with my job

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

2. In general, I don't like my job

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

3. In general, I like working here

1 (Strongly Disagree) 2 3 4 5 6 7 (Strongly Agree)

Cammann, C., Fichman, M., Jenkins, D., & Klesh, J. (1979). *The Michigan Organizational Assessment Questionnaire*. Unpublished manuscript, University of Michigan, Ann Arbor.

Human Ethics Certificate of Approval

Date: 21 December 2010

Project Number: CF10/3451 - 2010001830

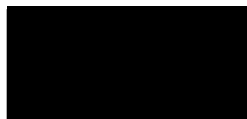
Project Title: Employee well-being and self-determination: Does a spillover effect occur for psychological need satisfaction?

Chief Investigator: Dr Dianne Vella-Brodrick

Approved: From: 21 December 2010 To: 21 December 2015

Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to MUHREC before any data collection can occur at the specified organisation. **Failure to provide permission letters to MUHREC before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research.**
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must contain your project number.
6. **Amendments to the approved project (including changes in personnel):** Requires the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.



Professor Ben Canny
Chair, MUHREC

cc: Mr Gavin Slemph