

A Pilot Study Exploring the Efficacy of an Acceptance and Commitment Therapy
Intervention for Emotional Eating and Weight Loss Maintenance

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ERRATA

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ADDENDUM

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Abstract

Weight loss maintenance has emerged as a significant challenge in efforts tackling overweight and obesity, and their associated risks of morbidity and mortality (Colagiuri et al., 2010; NHMRC, 2013; Stubbs & Lavin, 2013). The antidote to the health risks associated with overweight and obesity is weight loss; however, only successful weight loss maintenance results in sustained health benefits (NHMRC, 2013).

The statistics show that, while most people can lose weight using traditional behavioural based weight loss strategies, most people regain this lost weight (Wing & Phelan, 2005). Limited, yet cumulative, evidence suggests that the hitherto under explored variable of emotional eating, along with its theoretical underlying mechanism of action, avoidance, may explain significant unaccounted for variance within the weight loss maintenance puzzle (Bryne, 2002; Kayman, Bruvold & Stern, 1990; van Strien, Herman, & Verheijden, 2012).

Within the literature addressing overweight and obesity there has been a limited, yet collective, call for researchers to explore novel psychological treatment interventions targeting emotional eating in the context of weight loss maintenance (Koenders & van Strien, 2011; Neve, Morgan & Collins, 2011; Teixeira et al., 2010). An aim of this thesis is to answer this call.

In reviewing the problem of emotional eating and weight loss maintenance, as well as the theoretical understanding that avoidance develops and maintains this behaviour, it was reasoned that the psychological treatment intervention Acceptance and Commitment Therapy (ACT) would be best suited to tackling this challenge (Hayes, Strosahl, & Wilson, 2012). This was reasoned because ACT explicitly targets avoidance and related psychological processes within its therapeutic treatment interventions. Consequently, this thesis constitutes the first treatment intervention study to quantitatively bring together ACT and its two core

processes of experiential avoidance and cognitive fusion with emotional eating in the context of weight loss maintenance.

The global aim of the study was to evaluate the efficacy of a 1-day ACT group workshop treatment intervention for people who had recently lost weight targeting emotional eating to facilitate weight loss maintenance, using a randomised controlled trial design comparing a treatment group to a wait-list control group.

Participants ($N = 111$) volunteered after responding to research advertisements inviting people who struggle with emotional eating and weight loss maintenance to participate. Participants were randomly assigned to the 1-day ACTing on Weight group workshop which was the treatment group, or to the wait-list condition (i.e., the control group). Pre and post-treatment data was collected. The number of people who completed the pre-measures was $n = 43$ for the treatment group and $n = 56$ for the control group, and for the post-measures at three months the number of participants was $n = 28$ and $n = 32$ respectively. The following variables were psychometrically measured and analysed using multivariate statistics including mediation analyses: emotional eating, weight, weight loss maintenance, body mass index (BMI), waistline, experiential avoidance, weight related experiential avoidance, cognitive fusion, satisfaction with life, positive and negative affect, general health and obesity related well-being.

The results show that the participants who attended the 1-day ACTing on Weight group workshop were significantly more likely than the control group to maintain their weight and report decreases in emotional eating, as well as report more weight loss. They were also more likely to report significant improvements in weight related experiential avoidance, cognitive fusion, negative affect, general health and obesity related well-being while satisfaction with life, positive affect, and general experiential avoidance showed non-significant improvements. Further to these main effects, mediational analyses revealed that

weight related experiential avoidance was found to serve as a mediator of the effect of the 1-day ACTing on Weight group workshop on 10 of the 13 outcome variables including weight, BMI, five emotional eating scales, satisfaction with life, positive affect and obesity related well-being. In addition, cognitive fusion was found to serve as a mediator of the effect of the 1-day ACTing on Weight group workshop on 9 of the 13 outcome variables including four emotional eating scales, satisfaction with life, general health, positive affect, negative affect and obesity related well-being.

The practical implications of the findings are simple. They show that a 1-day ACT group based workshop can decrease emotional eating and improve weight loss maintenance, and related outcomes. The relative brevity of the treatment intervention compared to the previous intervention research also suggests that this approach could be a time and cost effective way to augment weight loss maintenance (Forman, Butryn, Hoffman, & Herbert, 2009; Forman & Butryn et al., 2012; Niemeier, Leahey, Palm Reed, Brown, & Wing, 2012). The theoretical implications are more remarkable for both the relatively distinct domains of the literature of weight loss maintenance and ACT which have been amalgamated through this research.

In terms of the weight loss maintenance literature, this study shows that when avoidance, as the theorised common mechanism of action underlying emotional eating is explicitly targeted in a psychological intervention, it can be significantly decreased, which in turn significantly decreases emotional eating. This finding was not surprising given the extent to which all the emotional eating theories purport this to be the case, the finding is however empirically novel (Evers, Stok, & de Ridder, 2010; Kaplan & Kaplan, 1957; Kayman et al., 1990). Also novel is that this study revealed a yet to be published finding showing that cognitive fusion is also a mechanism of action underlying emotional eating. This shows that weight related experiential avoidance and cognitive fusion both increase emotional eating.

The practical implication is that future treatment refinement should consider both of these variables in order to optimise successful weight loss maintenance treatment.

Through the paradigm of ACT theory and research, these findings support ACT's therapeutic and unified model of behaviour change. Specifically the findings confirm the theory that experiential avoidance and cognitive fusion serve as mediators of change in ACT treatment interventions. In addition, the results add to the growing list of treatment intervention studies showing that ACT is likely to be helpful for the spectrum of unhelpful eating behaviours as found in recent research (Barnes & Tantleff-Dunn, 2010; Juarascio, Forman, & Herbert, 2010; Lillis & Kendra, in press). Further, this research contributes evidence that supports the proposition that ACT is a transdiagnostic treatment intervention that can be applied to a wide range of health concerns because it targets common underlying mechanisms of action responsible for the development and maintenance of problems as opposed to targeting symptom specific content (Smout, Hayes, Atkins, Klausen, & Duguid, 2012).

The primary rationale for this study stems from the continuing rise in the prevalence of overweight and obesity both within Australia and the developed world. As prevalence rises, so to do the adverse health and financial consequences of morbidity and mortality related to overweight and obesity. Finding ways to facilitate improvements in the rates of successful weight loss maintenance to in turn improve morbidity and mortality is presently an unsolved problem. The findings of this research provide some novel answers and direction for future treatment refinement for the problem of emotional eating and unsuccessful weight loss maintenance.

General Declaration

In accordance with Monash University Doctorate Regulation 17/ Doctor of Philosophy and Master of Philosophy (MPhil) 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.

The core theme of the thesis is investigating the relationship between emotional eating, weight loss maintenance and Acceptance and Commitment Therapy. 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 Psychological Sciences under the supervision of Dr. J. Sabura Allen, Dr. Cate Bearsley-Smith, and Professor Paul R. Martin.

Signed:

Date:

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Chapter 1

Introduction and Thesis Overview

1.1 Introduction

There is now little debate that the rise in the prevalence of overweight and obesity has far reaching and formidable consequences related to mortality and morbidity. The percentage of adults in Australia who are considered overweight or obese is now over 60% (Australian Bureau of Statistics, 2011-2012). Although the etiological factors may differ amongst individuals, the adverse consequences of overweight and obesity significantly impact not only individuals, but also their families and society: the costs of overweight and obesity in both health and monetary terms are high.

The antidote to being overweight or obese is weight loss, and even modest weight loss can improve health outcomes (NHMRC, 2013). However, only weight loss that is maintained produces sustained improvements in health outcomes. Weight loss maintenance, however, remains elusive to many and has emerged as a crucial problem that needs to be solved.

It is possible that a focus on hitherto under explored psychological factors, together with a novel psychological treatment intervention, may play an important role in providing a solution to the problem of low rates of successful weight loss maintenance.

1.2 Thesis Overview

Chapter Two begins by highlighting the prevalence of overweight and obesity in Australia, then outlines the significant social and financial costs associated with these figures, before moving on to explore the research which suggests that, successful weight loss maintenance is one of, if not the greatest challenges facing the field of weight treatment today (Kiernan et al., 2013; Krashnewski et al., 2010; Niemeier, Phelan, Fava, & Wing, 2007). With previous research suggesting that new solutions are needed to help solve the problem of weight loss attained, but not maintained, emotional eating is identified as being a potential

psychological variable that may account for yet to be identified variance in the weight loss maintenance equation. The relationship between emotional eating and avoidant style coping, or simply avoidance, is then elucidated with Acceptance and Commitment Therapy identified as an innovative psychological treatment intervention that explicitly targets avoidance. Acceptance and Commitment Therapy is then identified as psychological intervention approach that may help to solve the problem of unsuccessful weight loss maintenance.

Chapter Three describes Acceptance and Commitment Therapy.

Chapter Four provides a global summary of Chapters Two and Three, concluding with the current research study's global aim, specific research questions, and hypotheses.

Chapter Five describes the methodology of the study, including the procedure, recruitment methods and activities, data collection methods and measures, and a summary of the 1-day ACTing on Weight group workshop treatment protocol.

Chapter Six presents the results.

Chapter Seven provides a discussion of the results that were presented in Chapter Six, paying particular attention to the meaning of findings. It contextualises the pattern of results with previous research, commenting on expected and unexpected results, and lists the strengths and limitations of this research study. To end, the theoretical and practical implications of the findings are discussed, finishing with a final conclusion.

Chapter 2

Overweight and Obesity, Weight Loss Maintenance, and Emotional Eating

Overweight and obesity are a problem because of the associated increased health risks of morbidity and mortality. Only weight loss that is maintained produces sustained increases in health benefits. This chapter highlights the prevalence and costs of overweight and obesity, showing that weight loss maintenance is a problem yet to be solved and that emotional eating may provide an answer to help solve the problem.

2.1 Overweight and Obesity in Australia: The Prevalence and Cost

Currently over half of Australian adults fulfil the criteria for being overweight or obese (Australian Bureau of Statistics: ABS, 2011-2012; NMHRC, 2013). According to the Australian Bureau of Statistics 2011-12 Australia Health Survey, 63% of Australian adults had a body mass index (BMI: a measure of body fat, based on calculating mass in kilograms, as divided by height squared) that classified them as either overweight or obese (ABS, 2011-2012). This result marks a 10.1% increase in the prevalence of overweight and obesity in Australia since 2007-08. Australia is not alone, and many, including the World Health Organisation (WHO), describe the rise in overweight and obesity as a global epidemic (WHO, 2000). The increasing prevalence of individuals who are overweight or obese is problematic because being overweight or obese is recognised as a risk factor in mortality and morbidity, and because the social and economic costs are also high (NMHRC, 2013). In 2005 it was estimated that the cost of obesity related health care in Australia was \$3.8 billion; this figure was revised in 2010 with the actual annual total direct cost of the overweight and obesity burden on Australians in 2005 totalling \$21 billion, which is well over the original estimate (Colagiuri et al., 2010). As well as direct health care related costs, there are also indirect costs, including “loss of productivity, early retirement, premature death and carer costs,” thereby decreasing individual involvement in societal activities which in turn

decreases the wider social equity (Colagiuri et al., 2010, p. 263). As Colagiuri et al. (2010) highlight, weight gain is associated with increased care costs while sustained weight loss is associated with decreased costs.

2.2 The Main Cause of Overweight and Obesity

A number of reasons have been identified as contributing to the rise in developed nations of individuals who are overweight or obese including biological, psychological and social etiological explanations (Sharma & Padwal, 2010). Despite the complexity of the explanations generated over the last few decades, the simple explanation of overeating, or the over consumption of food, is still upheld as one of the most significant contributing factors in the rise of overweight and obesity (Kemp, Bui, & Grier, 2013; Sharma & Padwal, 2010). This over consumption of food is seen in the context of, and thought to be related to, the current obesogenic environment (van Strien, Herman, & Verheijden, 2009). Van Strien et al. (2012) describe the obesogenic environment as “abundant availability of food, coupled with declines in physical activity in interaction with genetic susceptibility, encourage positive energy balance, weight gain, and ultimately overweight” (p. 782). As outlined by Sharma and Padwal (2010), overweight and obesity are “characterised by the accumulation of excess body fat and can be conceptualised as the physical manifestation of chronic energy excess” (p. 362), or more simply they state that “obesity is a sign [and] over eating is a symptom” where the energy or dietary intake is not balanced by energy output or physical activity (p. 362). Similarly, van Strien, Frijters, Bergers and Defares (1986) state that “the development and maintenance of obesity is attributable to overeating” (p. 296). It would be remiss not to mention that the simplicity of this equation has been challenged by some who argue that weight loss “is far more complex than eating less and exercising more” and cite “genetic, environmental, socio-cultural and psychological factors as contributing factors” (Thomas & McLeod, 2011 p. 1). However even those that endeavour to highlight the complexities of the

causes of obesity concede that at the most basic level the ‘energy in and energy out’ equation is true (Thomas & McLeod, 2011). To that end, a focus on overeating and eating behaviour is still central to the problem of overweight and obesity. The antidote to overweight and obesity is weight loss. When weight loss is achieved however, that does not automatically ameliorate the adverse health outcomes of overweight and obesity. It is only through successful weight loss maintenance that improved health outcomes are realised. However, evidence shows, that while most people can lose weight, maintaining weight loss remains a considerable challenge, and unsuccessful weight loss maintenance is the norm (Wing & Hill, 2001; Wing & Phelan, 2005; Stubbs & Lavin, 2013). Finding ways to improve weight loss maintenance is important because of the high morbidity and mortality associated with being unsuccessful.

The health risks associated with overweight and obesity are briefly reviewed in the next section of this thesis along with the health benefits associated with weight loss maintenance. Following that, the current knowledge about successful and unsuccessful weight loss maintenance is presented in detail.

2.3 Overweight and Obesity Health Risks, and Weight Loss Maintenance Benefits

Overweight and obesity, as indicated by elevated BMI levels, have consistently been associated with poorer health outcomes for the individual, including increased risk of morbidity and mortality (Bray, 2013a; NMHRC, 2013). Overweight is defined as a BMI of 25.0-29.9 and obese is a BMI greater than 30 (WHO, 2000). Being overweight is a necessary precursor to becoming obese. NMHRC (2013) explains that excess weight is a result of prolonged energy imbalance with excess energy stored as adipose tissue, usually referred to as fat, and that BMI measurements are essentially accounting for the weight of excess fat. Despite some criticism about BMI as a measurement tool both within the general population and within academia, it remains the most widely used tool in assessing weight and is endorsed by most expert groups (Bray, 2013b). Overweight and obesity, as measured by

BMI, are strongly associated with developing, maintaining or exacerbating several health problems or chronic diseases, including type 2 diabetes, cardiovascular disease, some cancers, and mental health and eating disorders (NHMRC, 2013, p. ix). Given the consistent empirical findings associating BMI with poorer health outcomes, a reluctance to accept BMI as a useful measure of physical health is contestable (Willet, 2012). Where people's BMI exceeds the healthy weight range, and they fulfil the criteria of overweight or obese, it is usually medically advised that they lose the excess weight, and maintain this weight loss to improve their health outcomes. The current 2013 National Health and Medical Research Council (NMHRC, 2013) guidelines for the clinical management of overweight and obesity in Australia outlines that even small amounts of weight loss can produce health benefits and state that a weight loss of 5% of initial body weight reduces health risks (Bray, 2013a; NMHRC, 2013). The NMHRC (2013) provides a detailed list of the health benefits even small amounts of weight loss can bring, including reduced cardiovascular risk and reduced systolic blood pressure, prevention and improved control of type 2 diabetes, improvements in chronic kidney disease, reduction in obstructive sleep apnoea, reduced knee pain related to osteoarthritis and improvements in mental health (p. 36). For a more in depth account of health risks of overweight and obesity, and the health benefits of losing modest amounts of weight, see Bray (2013a) and Bray (2013b). To facilitate improved health outcomes through sustained weight loss it seems prudent to consolidate what we know about successful and unsuccessful weight loss maintenance, and the following section details this.

2.4 Successful and Unsuccessful Weight Loss Maintenance

Although weight loss itself can be difficult to achieve, weight loss maintenance is proving to be an even more significant challenge facing the field of obesity treatment (Kiernan et al., 2013; Kraschnewski et al., 2010; Niemeier et al., 2007; Stubbs & Lavin, 2013; Willett, 2012; Wing & Hill, 2001; Wing & Phelan, 2005).

A significant amount of the research that aims to differentiate between successful and unsuccessful weight loss maintainers comes from the work of Dr Rena R. Wing and Dr James O. Hill who in 1994 established the American National Weight Control Registry (NWCR). The NWCR is the largest prospective investigation to identify characteristics of long-term successful weight loss maintenance. The data extracted from the NWCR is consistent with the broader research findings that show that it is dietary intake and physical activity-based behavioural strategies that are overt and objectively measurable, that appear to help people lose weight, and that also dominate the weight loss treatment arena and the empirical literature (Wing & Phelan, 2005; Moreno & Johnston, 2012). Despite people being able to lose weight initially, most people (about 80%) regain the lost weight. To improve the maintenance rate of weight loss, the factors contributing to unsuccessful weight loss maintenance need closer attention, especially in the context of the current overweight and obese prevalence trajectory (Kraschnewski et al., 2010; Niemeier et al., 2007; Ohsiek & Williams, 2011). McGuire, Wing, Klem, Lang and Hill (1999) and Wing and Phelan (2005) have suggested that a substantial part of unsuccessful weight maintenance can be attributed to an individual's inability to maintain the healthy overt behavioural strategies of balanced eating and exercise that they used in their initial weight loss efforts. This then begs the question: "How do successful weight maintainers adhere to these overt objectively measurable behavioural strategies when most other people cannot?" This question has led researchers working in the area of overweight and obesity to call for the exploration of psychological factors, that is, an individual's covert internal thoughts and emotions which may have the potential to explain yet to be accounted for variance in the weight loss maintenance equation. A question drawn from Byrne (2002) is: "What are the underlying psychological mechanisms that motivate or drive an individual to adhere to workable behavioural strategies to facilitate successful weight loss maintenance?" The variance that

psychological factors may contribute to the weight loss maintenance equation is a hitherto under explored area with these factors largely overlooked in most treatment programs, as well as in empirical treatment trial research and the empirical literature generally (Byrne, 2002; Elfhag & Rossner, 2005; Ohsiek & Williams, 2011; Sharam & Padwal, 2010; Wing & Hill, 2001). Given the long standing academic and public interest shown toward understanding people's psychology in terms of their relationship with food, eating and weight, this under investigation is surprising. Further, given the impact that overweight and obesity are having on the individual, familial and societal levels, it is imperative these under investigated psychological factors are explored so new solutions can be found to help improve both prevention and treatment outcomes beyond what is already known (Pidgeon, Lacota, & Champion, 2013).

In the next section a detailed overview of the empirical literature pertaining to the psychological factors contributing to weight loss maintenance is provided. Before moving on however, here is a brief overview of the differentiation between behavioural factors and psychological factors as found within the literature pertaining to weight loss and weight loss maintenance. As mentioned earlier, most treatments and empirical research focus on factors described as behavioural factors or strategies and include overt and objectively measureable factors including dietary intake, engagement in exercise, self-monitoring and changing environmental cues. These behavioural strategies are helpful for both weight loss and weight loss maintenance if they are adhered to (Bray, 2013c). It could be argued that differentiating between behavioural factors and psychological factors is a false dichotomy because within contemporary theories of psychology all behaviour is psychological in nature, be it overt or covert. This literature review is however, grounded in the paradigms set by the existing literature that differentiates between overt behavioural factors as described above and covert behavioural factors which are referred to as psychological factors. As referred to in the

literature within this area, psychological factors are individuals' internal stimuli such as thoughts and emotions. It is these covert psychological factors that may provide insight into how people adhere to the efficacious overt behavioural strategies that facilitate both initial weight loss and successful weight loss maintenance.

2.5 Weight Loss Maintenance and Psychological Factors

The first comprehensive review of the empirical literature that explored the psychological factors associated with weight loss maintenance was published by Byrne (2002). Although comprehensive, Byrne acknowledged that the findings are limited as a direct consequence of the small number of papers ($N = 16$) published addressing this area. This limitation has not greatly improved since 2002, and “very little literature exists addressing how psychological interventions affect weight loss maintenance” (Ohsiek & Williams, 2011, p. 600). Byrne (2002) concluded that there were six broad factors that might provide variance within the weight loss maintenance equation: (a) weight loss goal; (b) coping strategies and problem solving skills; (c) self-efficacy; (d) vigilance with regard to weight control; (e) effort versus benefits of adhering to weight maintenance regime; (f) binge eating, dietary restraint, disinhibition and hunger (p. 1032). Of these categories ‘coping strategies and problem solving skills’ had the most contributing evidence with four publications. Byrne (2002) concluded that the evidence within this category reflected “a tendency for regainers to use food or eating to moderate negative mood states, rather than apply more appropriate coping strategies” that did not involve eating (p. 1033). The limited number, as well as the heterogeneity of the publications, reviewed by Byrne restricted her conclusions. She cites the issues of retrospective designs, small sample sizes, unrepresentative sample populations, and the reliance on correlational data analysis as also limiting her conclusions especially in relation to causal explanations. Despite the limitations one of the key messages from Byrne (2002) was the apparent relationship between eating, or

using food as an unhelpful coping strategy, and unsuccessful weight loss maintenance. More broadly, Byrne's review highlighted a substantial gap within the weight loss maintenance literature and showed the need to further explore psychological factors.

Recognising the gap in the research pertaining to the psychological factors predicting successful weight loss maintenance Byrne, Cooper and Fairburn (2003) conducted a study to further investigate the potential psychological predictors. Formal qualitative research methods were employed and included individual interviews and group interviews to identify characteristics that differentiated successful weight maintainers and unsuccessful weight maintainers or weight regainers ($N = 76$). In total, they extracted five psychological factors that differentiated unsuccessful weight maintainers from successful weight regainers. Four of these factors were characterised as 'cognitive factors' and reported as (a) failure to achieve weight goals and dissatisfaction with the weight achieved, (b) the tendency to evaluate self-worth in terms of weight and shape, (c) a lack of vigilance with regard to weight control, (d) a dichotomous (black-and-white) thinking style (p. 955). One of the five factors was defined as an 'affective factor' and was reported as "the tendency to use eating to regulate mood" (p. 955). More specifically, Byrne et al. (2003) reported that regainers were more likely "to report using eating to regulate their mood ('comfort eating') or to distract themselves from unpleasant thoughts and mood ('avoidance eating')" (p. 960). These findings are consistent with Byrne's (2002) earlier conclusion that showed "a tendency for regainers to use food or eating to moderate negative mood states, rather than apply more appropriate coping strategies" (p. 1033). Taken together Byrne (2002) and Byrne et al. (2003) suggest that eating to moderate emotional states in the context of weight loss maintenance may be a psychological predictor worthy of more rigorous, prospective and quantitative research.

In reviewing the literature pre and post Byrne (2002) and Byrne et al. (2003) little research attention in the context of weight loss maintenance has been paid to eating as a

means of affect regulation, eating as an emotion regulation strategy or eating in response to emotion. Conversely, eating as an avoidance strategy in response to negative emotional states is a common finding within the literature that explores the causes of obesity where results show that people who are overweight or obese use eating to avoid emotion (Andrews, Lowe, & Clair, 2011; Blair, Lewis, & Booth, 1990; Canetti, Bachar, & Berry, 2002; Ganley, 1989; Ozier et al., 2008). In fact, since Ganley's seminal review published in 1989, eating in response to emotion has regularly been found to be associated with overweight and obesity (Koenders & van Strien, 2011; Konttinen, Männistö, Sarlio-Lähteenkorva, Silventoinen, & Haukkala, 2010; Konttinen, Silventoinen, Sarlio-Lähteenkorva, Männistö, & Haukkala, 2010). Given that eating in response to emotion is a result regularly found within the overweight and obesity literature, it is surprising that it has not translated into research exploring its predictive value within the arena of weight loss maintenance, an area which is in need of innovative thinking to improve weight loss maintenance rates. Eating in response to emotion is a factor subsumed within the broadly ignored psychological factors in the weight loss maintenance equation, and so is itself under investigated. Given the ever present importance of finding new solutions to solve the problem of unsuccessful weight loss maintenance, exploring the contribution that eating in response to emotion contributes to the weight loss maintenance equation is a worthwhile endeavour (Evers, et al., 2010). The next section of this thesis presents a brief review of the literature that explores the concept of eating in response to emotion. Following that, a brief review of the recent empirical evidence linking this with overweight and obesity is provided, which is then followed by amalgamating these areas with the available literature specifically addressing weight loss maintenance.

2.6 Eating in Response to Emotion: Emotional Eating

Emotional eating is an umbrella term commonly referred to in the literature that includes eating to avoid emotion, eating as a coping strategy, eating as a means of affect regulation, eating as an emotional regulation strategy, or eating in response to emotion. Popular culture uses the terms ‘emotional eating’ and ‘comfort eating’ interchangeably (Ganley, 1989; Lowe & Fisher, 1983; NMHRC, 2013). Emotional eating can be defined as ‘the tendency to eat in response to emotional distress’ (Canetti, Berry, & Elizur, 2009, p. 109). Ganley’s (1989) review of emotions and eating concluded that the significant function of emotional eating is its ability to reduce negative affect such as ‘anger, depression, loneliness, boredom and anxiety’ (p. 358). Kayman, et al. (1990) labelled eating in response to emotion as escape-avoidance coping, and stated that eating this way is used to avoid or moderate negative mood or emotional distress instead of using more adaptive coping strategies that do not involve food. There are a number of theories that purport to explain emotional eating.

2.6.1 Theories of emotional eating. In their classic article published in 1957, Kaplan and Kaplan presented their *psychosomatic theory of obesity* suggesting that people eat for reasons other than hunger (i.e., the physiological need to eat), because eating temporarily alleviates negative emotions, primarily anxiety. The theory proposed that the physical act of eating is physiologically incompatible with feeling intense emotions and as a result negative emotion ameliorates through the act of eating. Consequently, eating to reduce anxiety increases the likelihood of becoming overweight because eating occurs in the absence of genuine physiological hunger and regardless of energy requirements, resulting in the overconsumption of food. *Bruch’s theory* of emotional eating is also a psychosomatic theory and purports that people learn to overeat to reduce negative affect because they have not learnt to differentiate between the unpleasant feelings of hunger and other unpleasant or

negative emotions, and/or unpleasant sensations (Bruch, 1973 as cited in Canetti et al. 2002). Bruch states that, as a result, people who are overweight are likely to be eating in response to emotional tension and uncomfortable sensations and feelings because they confuse these uncomfortable feelings with the uncomfortable sensation of hunger. Both Kaplan and Kaplan (1957) and Bruch (1973) concur that people who are overweight are so because they are most likely eating in response to unpleasant or negative emotional states in an attempt to reduce and avoid them, instead of only eating for physiological hunger, or nutritional reasons. Similarly, more recent affect regulation models state that emotional eaters eat as a result of learning that eating alleviates unpleasant mood. Here eating acts as a negative reinforcement; it acts to take away unpleasant or negative internal states (Hawkins & Clement, 1984). The *escape theory* presented by Heatherton and Baumeister (1991) can be viewed on a similar continuum with the psychosomatic and affect regulation theories; however this theory goes further by postulating that overeating functions as an escape mechanism which is used to shift attention away from, or to avoid, stimulus that is threatening to the ego due to its ability to precipitate aversive self-awareness. In the escape theory, food is used to avoid threatening realisations of self-awareness and the associated negative mood state that such awareness is likely to induce. Despite their individual nuances, taken as a whole, all these theories recognise emotional aspects of eating and explain that eating in the absence of genuine physiological hunger is used and maintained because it functions to reduce, regulate, or help people cope with or avoid experiences of negative or aversive internal emotional states. In addition to these widely documented theoretical accounts of emotional eating, more recently Levitan and Davis (2010) published a review detailing the application of *attachment theory* and the *addiction model* to emotional eating. Attachment theory explains how helpful early interpersonal dynamics, labelled as secure attachment, fosters optimal development of emotion regulation skills and capacity. Secure attachment is developed when a child

experiences being able to rely on a predictive, available and responsive caregiver. Helpful and adaptive coping capabilities also known as emotion regulation skills are learnt in a secure attachment relationship. Conversely, insecure attachment styles lack interpersonal experiences that provide safe opportunities to learn and develop helpful emotion regulation skills. As a consequence individuals with insecure attachment styles find compensatory behaviours to offset deficits in helpful regulation skills. Levitan and Davis (2010) explain that it is likely that emotional eating, like other behaviours, “can take on the function of regulating affect when more adaptive, attachment based strategies are not available” (Levitan & Davis, 2010, p. 788). Levitan and Davis (2010) highlight that although insecure attachment styles have consistently been found to be associated with eating disorders, there is a “significant gap in both research and theoretical exploration applying attachment theory to the area of emotional eating and obesity requiring more work to be done” (p. 787). As with the aforementioned theories, the central premise underlying this theory is that eating occurs for emotional reasons and in the absence of genuine physiological reasons. In addition, Levitan and Davis (2010) also indicate that “newer models of overeating based on addiction science are also of great interest when thinking about emotional eating” (p. 793). Here emotional eating is presented within the *addiction model*, and food as an ingestible substance that can be overused or misused is conceptualised as a drug, and that like any psychotropic substance activates natural brain reward pathways and “like other addictive substances, may be used for comfort or to improve mood” (p. 790). Levitan and Davis (2010) also cite evidence that shows that “high-caloric foods can perturb the brain in a manner similar to addictive drugs” (p. 790). Stubbs et al. (2011) also highlight that obesity has also been labelled as a “chronic relapse condition that requires lifelong management” in the same way as addictions require strategies for coping to avoid relapse (Stubbs et al., 2011, p. 704). Again overall, analogous to the aforementioned theories, here eating is used to avoid aversive mood states.

Although not regarded as emotional eating per se, it would be remiss not to mention the *restraint/disinhibition* theory of obesity. First introduced by Herman and Mack (1975) it was further developed by Herman and Polivy (1983). According to this theory some individuals are constantly trying to restrict or restrain their eating, i.e. dieting/eating less than they would like to, in an effort to lose or maintain their weight. It is postulated that this restraint involves a considerable amount of cognitive effort and that under conditions of negative emotion the cognitive load is overwhelmed and results in restrained eaters becoming distracted from their eating goals, and in turn they become disinhibited with their eating which results in overeating or lost control over eating. Although this definition is overly simplified, for the purposes of this paper it shows that this theory somewhat overlaps with the psychosomatic theories of emotional eating because it also recognises that the presence of emotions change eating behaviour and induce over consumption of food. Similarly, although not emotional eating per se, the construct of *external eating* is also being noted here because it is well documented in the obesity literature. The construct of external eating comes from the external theory of obesity as presented by Schachter, Goldman and Gordon (1968, as cited in van Strien et al., 1986). As defined by van Strien et al. (2012) external eating refers to “the overeating tendency from susceptibility to tempting food cues” within the environment (p. 783). Despite some findings that external eating may account for variance in increase in BMI recently, van Strien et al. (2012) found that external eating was not associated with BMI change and that this finding adds “to the cumulating evidence that external eating may not be a good predictor of BMI change” (p. 787). Others have also recently found that external eating is not a significant predictor of overweight and obesity (Butryn, Thomas, & Lowe, 2009; Koenders & van Strien, 2011; Niemeier et al., 2007; van Strien et al., 2009). It is also important to acknowledge that emotional eating or “comfort eating may overlap with binge eating” (Gibson, 2012, p. 442). A review of the binge eating literature is beyond the scope of

this research but a simple differentiation is warranted. Gibson (2012) eloquently differentiates between the two by stating that binge eating “requires clear evidence of excessive and frequent intake” (p. 442) and can be viewed in clinical terms and is linked to a clinical diagnosis. Comparatively, emotional eating can be “considered a phenomenon that may be common in nonclinical populations and may not necessarily involve episodes of excessive consumption” (p. 442). Despite being different they do share a common element and that is that they “both share an important outcome that the foods eaten provide some alleviation of negative affect, even if primarily by distraction from the thoughts and threats that may be engendering the negative affect” (Gibson, 2012, p. 452).

In reviewing the theories and empirical evidence pertaining to food and emotion, Canetti et al. (2002) concluded by stating that it has been confirmed that “obese people engage in significantly more emotion eating than the non-obese... in line with the psychosomatic theories of obesity” (p. 162). The theories and empirical evidence also show that eating is occurring in the absence of physiological needs, and it is for this reason emotional eating adversely affects individuals’ health and leads to overweight and obesity. The next section provides a review of the association between emotional eating and overweight and obesity and weight loss maintenance.

2.6.2 Emotional eating, overweight and obesity and weight loss maintenance.

Stated simply, emotional eating is not conducive to successful weight loss maintenance because eating occurs in the absence of genuine physiological hunger. As a consequence emotional eating is most likely to result in the overconsumption of food or overeating, leading to excess energy stored within the body, promoting the development and maintenance of overweight and obesity (e.g. Canetti et al., 2009; Heatherton, Herman, & Polivy, 1991; Kaplan & Kaplan, 1957; Laitinen, Ek, & Sovio, 2002; Leon & Chamberlain, 1973; van Strien et al., 1986). Between 2009 and 2012 there were six empirical studies published that together

confirm an association between higher rates of overeating with emotional eating and higher BMI (Kemp, Bui, & Grier, 2011; Koenders & van Strien, 2011; Konttinen & Mannisto, et al., 2010; Konttinen & Silventoinen et al., 2010; van Strien et al., 2012; van Strien, et al., 2009). The conclusions in the study by van Strien et al. (2012) are representative of the cumulative findings and state that “high emotional eaters seem at risk for developing overweight because overconsumption seems to be more strongly related to weight gain in people with high degrees of emotional eating” (p. 782). Despite the limitations of each individual study, as a group the heterogeneity of the studies strengthen the cumulative findings because emotional eating is found to be predictive of overweight and obesity under a variety of research design conditions and data analysis techniques. Specifically, both retrospective and prospective methods were used, small and large sample sizes were realised ($N = 4986$, Konttinen & Silventoinen et al., 2010), broad community based samples were attained, simple correlational analyses through to structural equation modelling were employed and covariates were often controlled. Within these diverse research approaches, all essentially found that “high emotional eaters seem at risk for developing overweight” (van Strien et al., 2009, p. 386). As a whole the conclusions from each study concur with Kemp et al. (2011) who state that emotional eating is impacting the overweight and obesity epidemic and that interventions need to target emotional eating to teach alternatives for managing emotions concluding that “continued research on emotional eating appears to be a worthwhile path in addressing ... obesity” (p. 225). These recent cumulative findings and conclusions provide compounding evidence that emotional eating is associated with overweight and obesity and at the same time act to further highlight the gap that exists in the research when it comes to the amalgamation of this factor within the context of weight loss maintenance. Although presented in brief, this section provides the evidence to show that emotional eating and overweight and obesity are

empirically associated. The empirical literature as it pertains specifically to emotional eating and weight loss maintenance is presented next.

2.6.3 Emotional eating and weight loss maintenance. In this section the empirical evidence explicitly investigating emotional eating and weight loss maintenance is presented in detail. Throughout the evidence presented there are various terms that are used to describe successful or unsuccessful weight loss maintenance. Unsuccessful weight loss maintainers, regainers or relapsers are defined as people who have lost weight, but have regained the lost weight. Successful weight loss maintainers or maintainers are defined as people who have lost weight and not regained the weight. Controls are defined as people in the healthy weight range who have never been overweight or obese. The definition of weight loss maintenance is mixed throughout the research, and Wing and Hill (2001) observed that there is no consistent criteria in the empirical literature that define successful weight loss maintenance. The most common definitions include maintaining a loss of the initial weight loss of between 5-10% or maintaining a discrete minimum pound or kilogram loss amount which is usually 5lb or 2.3 kilograms (Wing & Hill, 2001; Wing & Phelan, 2005; Byrne 2002; Lillis, Hayes, Bunting, & Masuda, 2009; McGuire et al., 1999; St Jeor et al., 1997; Stevens, Truesdale, McClain, & Cai, 2006). Conversely, the definition of successful weight loss is clearer and is in line with the cumulative knowledge that a 5% weight loss of initial weight can have health benefits (NIMHRC, 2013). These mixed definitions cannot be avoided when reviewing the literature, and because of the limited amount of literature pertaining to emotional eating, together with weight loss maintenance, the gamut of definitions have been accepted as relevant to this research. To begin exploring the relationship between emotional eating and weight loss maintenance four of the very first publications to report on this area are presented, followed by the presentation of more recent evidence.

Leon and Chamberlain (1973) provide one of the earliest insights into the relationship between weight loss maintenance and emotional eating, or as they conceptualised it, eating in response to emotional arousal. This study compared regainers, maintainers, and control participants on 40 questions ($N = 85$). Chi-square analysis was employed to the questionnaire items according to group membership. Leon and Chamberlain (1973) found that 29.4% of regainers were more likely to choose several arousal states as being related to eating, including being angry, lonely, bored, frustrated, anxious or nervous, and also being happy, excited and celebratory. Comparatively, 22.7% of maintainers and only 7.7% of controls related these emotions to eating. Furthermore, in response to the question 'Why do you eat?' multiple arousal states were listed by 50% of regainers compared to 27.3% of maintainers. They also found that only 8.8% of regainers reported eating when they were hungry, compared to nearly half of controls 48.7%. Leon and Chamberlain (1973) concluded that there is a relationship between unsuccessful weight loss maintenance and more eating in response to emotional arousal, and stated that eating in response to emotion is unhelpful because it is not related to reports of hunger, so is more likely to cause weight gain. They also concluded that one potential area for further research was to clarify whether regainers can learn how to limit eating in response to emotional arousal which appears to be a characteristic of maintainers. Limitations of the study include the retrospective design, the use of unique multiple choice questionnaires as opposed to psychometrically validated measures, and the inability to extract any strength of associations from the data. The most significant limitation of this study is that the results are unable to provide any insight into the participant's baseline levels of emotional eating and the impact that this has on their categorisation as maintainers or regainers. More specifically, it is possible that at baseline both maintainers and regainers reacted to emotions by eating at the same rate, but maintainers somehow learnt to limit their eating in response to emotion. Or conversely, the categorisation process may show that

people who at baseline had the capacity to limit their eating in response to emotion are the ones who maintained their weight loss and therefore were categorised as maintainers. It is important to consider limitations like this in research design and analysis, however for the purposes of this line of enquiry this limitation is not as impactful as it might be for other purposes. The reason for this accommodation is that both possibilities point to the usefulness of people being able to reduce their emotional eating to facilitate weight loss maintenance. Despite its flaws this publication is important because it is one of the first of a limited number of studies aiming to explore this area.

In 1981 Gormally and Rardin published a study in which the primary aim was to compare a behavioural counselling treatment intervention to a nutrition education approach. Participants ($N = 112$) were recruited through local papers and were randomly assigned to either group condition. Participants in both of the conditions attended 16 x 1.5 hour group sessions each. The behavioural counselling condition focused on changing habits and did not mention caloric intake and de-emphasised this factor if introduced by participants, while the nutrition education procedure emphasised the caloric deficit equation and de-emphasised behaviour modification principles. The results showed that there was no difference in the amount of weight lost between the conditions; however the behaviour modification condition produced better weight loss maintenance outcomes. To explore factors influencing weight loss maintenance, maintainers and regainers from each group were interviewed ($n = 38$). Both maintainers and regainers were successful at losing weight; however, at follow-up, regainers had regained an average of 5.5kg compared to maintainers who had regained 1.6kg. Several factors emerged as differentiating maintainers from regainers. Maintainers were more likely to monitor their weight and eating and engage in regular and vigorous planned exercise, use effective problem solving skills and were less likely to eat in response to emotion. The results showed that 82% of regainers “reported eating in response to emotions, although none of the

maintainers reported such problems” (p. 301). It is noteworthy that both maintainers and regainers reported a similar number of unpredictable major life events. This study is valuable because it provides confirmative evidence for the assertions emerging in Leon and Chamberlin (1973) that regainers are more likely to eat to deal with their emotions. A strength of this study is that it used a prospective design and randomised control design methods. Generalisability of the results is limited due to the homogeneous sample that consisted of mainly married women (81%) aged between 24-55 years. Overall these findings are important because they contribute to the base knowledge about the differences attributable to successful and unsuccessful weight loss maintenance, but more importantly provide substantial early evidence that regainers appear “to deal with emotions by eating” (p. 302).

Another early insight into the relationship between eating in response to emotion and weight loss maintenance comes from Marston and Criss (1984) who explored predictive variables of successful weight loss maintenance. Participants ($N = 47$) were people who had been 15% or more overweight and had recently reached their goal weight. The research constituted a tracking project where participants completed a self-report questionnaire every four months for one year. Eight factors were extracted as being able to predict unsuccessful weight loss maintenance with 95% being able to be categorised correctly. The authors concluded that two factors especially relevant for intervention implications were results that showed “maintainers were more likely to exercise several times per week and less likely to eat for emotional reasons” (p. 435). Similarly to Leon and Chamberlain (1973) this research is important as it shows early findings about the relationship between weight loss maintenance and emotional eating. It nonetheless has limitations, including a small sample size especially once participants were grouped into categories, and the dichotomous chi square analyses where continuous data was subjected to a median split which means nuances

in the data may have been overlooked including, for example, strengths of associations between variables. A strength is that this study is prospective rather than retrospective; however it is possible that the “tracking procedure was itself a maintenance treatment” (p. 439). Further, similarly to Leon and Chamberlain (1973), the data does not allow insight into the participants’ baseline levels of emotional eating, and the impact this has on their categorisation as maintainers or regainers. In addition, the research did not include any previously psychometrically validated measures which, if included, could have strengthened the findings drawn from the research. Notwithstanding the limitations, this study contributes to the early indications suggesting that emotional eating could be a good target for a treatment intervention to enhance weight loss maintenance. After these three early studies, Kayman et al. (1990) can be categorised as a seminal article and is the study most often cited in reference to the exploration of factors that differentiate successful and unsuccessful weight loss maintainers. Kaymen et al. (1990) found that “relapsers did not deal with their problems directly ... and reported that they used food to make themselves feel better when upset” (p. 805).

Kayman et al. (1990) explored variables associated with weight loss maintenance and relapse, or regain, after initial weight loss. Participants were randomly selected from a pool of 700 female volunteers. The final participant pool ($N = 108$) consisted of 30 formerly obese women who had been successful at maintaining their weight loss within the healthy weight range for at least the last two years, 44 obese women who had been unsuccessful in their weight loss maintenance effort, having previously lost at least 20% of their weight but regaining it all back, and 34 women with no history of being overweight or obese who had been successful in maintaining their weight within 3.6 kg of their current weight. The study’s explicit aim was to generate hypothesis about the factors that impact weight loss maintenance. It was reported that they used the ‘*Joint Method*’ to qualitatively explore, using

individual and group interviews, the factors each group thought contributed to their weight loss maintenance outcomes. After all verbal results were analysed and distilled, a questionnaire was developed. Participants were then asked to provide written responses for quantitative data analysis. Kayman et al. (1990) found that escape-avoidance style coping responses significantly ($p < .001$) differentiated successful weight loss maintenance from unsuccessful weight loss maintenance. Specific escape-avoidance behaviours were “eats, smokes, takes tranquilizers, sleeps more, wishes problems would go away”. Significantly more regainers (70%) used “emotion-focused or escape-avoidance ways of coping, such as eating” than either successful weight loss maintainers (33%) or controls (35%). The function of this escape-avoidance eating was reported by participants as making “themselves feel better when upset” (p. 805). Alongside this finding it was reported that there were no significant differences between the type and/or number of stressful or troubling issues or events present in the lives of all the women in the study. There was however a significant difference found in coping and problem-solving styles. Only 10% of regainers reported using direct ways of coping or problem-solving, compared to 95% of maintainers and 60% of controls. These findings suggest that it is not the amount or type of stress or emotion that people experience that impacts successful weight loss maintenance, but how people deal or cope with emotion and the extent to which eating is employed as a coping strategy to deal with such emotion. This study is important because it provides early cumulative evidence that emotional eating is associated with unsuccessful weight loss maintenance. The main strength of the study is that the final questionnaire is informed by people representative of the target population and the questionnaire development started with open-ended interviews to gain the greatest number of differentiating factors possible. The research design appears to be sound for the explicit purpose of the research, i.e. hypothesis generating. Limiting the findings however, was that there is no hypothesis testing or hypothesis confirmation. The

generalisability of the findings are also limited to the characteristics of the participant sample which was predominantly Caucasian, married and middle-aged women and all were recruited from the same health service organisation. Also limiting the findings is that no previously validated psychometric measures were included in the study. Although understandable given the overall aim of the study, including even a limited number of these types of measures could have strengthened the findings. A further limitation of the paper which has implications for subsequent citings of its findings, is that the Abstract states that most relapses (70%) “ate unconsciously in response to emotions” (p. 800). When the results section is reviewed carefully however it is reported that 70% of relapses use an escape-avoidance coping style which subsumes the acts of ingestion including eating, as well as sleeping and wishing problems would go away. It is possible that through the abstract of this paper the results pertaining to the association between weight loss maintenance and emotional eating have been overstated, and possibly subsequent references to the publication have perpetuated this overstatement. Regardless of this anomaly Kayman et al. (1990) nonetheless provides confirmatory evidence to Marston and Criss (1984), Gormally and Rardin (1981), and Leon and Chamberlain (1973) and together these four publications provide impetus for the further exploration of emotional eating in the context of weight loss maintenance. Despite what was emerging as a worthwhile line of investigation there appeared to be a relative hiatus in the literature addressing emotional eating and weight loss maintenance until Byrne (2002) and colleagues (Byrne et al., 2003; Byrne, Cooper, & Fairburn, 2004) reinvigorated investigations. The next section will detail the work of Byrne and colleagues followed by a review of the more recent empirical evidence associating emotional eating and weight loss maintenance.

2.6.4 Emotional eating and weight loss maintenance: the recent empirical

publications. As outlined earlier, Byrne's (2002) review of the literature found cumulative evidence suggesting a significant relationship between emotional eating and weight loss maintenance where eating is used to "moderate negative mood states, rather than apply more appropriate coping strategies" (p. 1033). Driven by the results of the review study two subsequent studies by Byrne and colleagues (2003, 2004) found that emotional eating labelled as 'eating to regulate mood' is a predictor in the weight loss maintenance equation. The 2003 study was briefly introduced earlier. In this study formal qualitative methods were used to find differentiating characteristics between maintainers and regainers ($N = 76$). One of the five factors as detailed earlier was "eating used to regulate mood or act as distraction" (p. 958). Byrne stated that "when faced with a stressful situation regainers reported that they habitually overate", and that regainers were more likely "to report using eating to regulate their mood ('comfort eating') or to distract themselves from unpleasant thoughts and mood ('avoidance eating')" (Byrne et al., 2003, p. 960). More specifically the results showed that 90% of regainers used eating to regulate their mood or used food to act as a distraction; only 20% of maintainers endorsed this factor and 0% of healthy weight individuals endorsed this factor. Furthermore, 91% of regainers also indicated that they responded to adverse life events by eating; conversely, only 20% of maintainers and 11% of healthy weight individuals reported this behaviour. Byrne et al. (2003) described eating to regulate mood as 'comfort eating' and eating as a distraction as 'avoidance eating' and included verbatim quotes from two participants classified as regainers which described the function of eating as it relates to them. The participants said "Food is like a sedative to me. It knocks me out, like a drug. When I feel any little bit of sadness or anger, I eat" and "Eating stops the process of my brain going. It offers relief from thoughts that might actually be quite uncomfortable" (p. 960). In conclusion, Byrne et al. (2003) suggested that weight regain is likely inevitable when eating

is repetitively used to regulate mood, avoid negative affect, and cope with stress. The limitations of this study are similar to those listed for Kayman et al. (1990). In addition, given the thoroughness of Byrne's (2002) original review it is possible that some hypothesis confirmation measures or analysis could have been included despite the main aim of the study being hypothesis generating. Again, similar to the previous studies reviewed, this study is also retrospective with no prospective elements. The generalisability of the results are also worth noting as the sample was predominantly middle-aged, married women. The main strength of this study is that it employed comprehensive formal qualitative methods that generated specific hypothesis that can be tested in prospective research designs. Despite its limitations the findings of this study are important because firstly they contribute to this broadly ignored research area, and secondly they provide the impetus for contemporary research exploring the quantitative association between emotional eating and weight loss maintenance.

In 2004 Byrne, Cooper and Fairburn published a quantitative follow-up study to Byrne et al. (2002; 2003) to further explore the association between psychological factors and weight loss maintenance, including emotional eating. Despite the evidence found in Byrne et al. (2003) that there was an association between emotional eating and unsuccessful weight loss maintenance, this follow-up study did not support this earlier finding. In critically analysing the follow-up study however, significant limitations exist that may have contributed to the null finding. The study design constituted a prospective study. The measures included traditionally measured behavioural factors such as dietary intake and activity level as well as demographic and weight history information including maximum lifetime weight, and weight at the beginning of their current weight loss attempt and current weight. Eighteen psychological variables were measured and included satisfaction with weight, importance of shape and weight, goal achievement, priority of weight control,

vigilance, perception of deprivation and dietary restraint, effort versus benefit payoff, self-efficacy, adverse life events, and dichotomous thinking. Comfort eating, the “tendency to use eating to regulate mood”, and avoidance eating, used to “avoid negative affect or to cope with adverse life events” were also included as psychological factors (p. 1342). Participants ($N = 53$) were women who had recently lost at least 10% of their initial weight and were recruited by the researches who attended community slimming classes of two major organisations in the United Kingdom. Data was collected via face-to-face structured interviews and a number of subsequent semi-structured interviews occurred via phone over a one year follow-up period. Results of logistic regression analysis showed that only two factors, one historical and one psychological, were identified to be prospective predictors of unsuccessful weight loss maintenance: maximum weight and dichotomous thinking. Higher maximum weights and higher dichotomous thinking uniquely and significantly predicted weight regain. Byrne et al. (2004) describe dichotomous thinking to be a “form of cognitive rigidity whereby individuals tend to ‘place all experience in one of two opposite categories’ instead of on a continuum” the style being characterised by thinking that is “absolutist, categorical, all-or-nothing” (Byrne et al., 2004, p. 1352). It is not surprising that dichotomous thinking was found to be associated with unsuccessful weight loss maintenance; however, taken in the context of Byrne and colleagues (2002, 2003) earlier findings that point to a strong relationship between emotional eating and weight loss maintenance, the non-significant result for the avoidance eating and comfort eating factors *is* surprising. Specifically, in the earlier study by Byrne et al. (2003) both dichotomous thinking *and* “eating to regulate mood, avoid negative affect, or cope with stressful circumstances” (p. 961) were found to be related to weight regain. This surprise is however ameliorated when the way the emotional eating factor was measured is compared to the way the dichotomous thinking factor was measured. In fact, all the psychological factors were measured in an inferior way to the dichotomous thinking factor.

Specifically, all the psychological factors bar dichotomous thinking were measured via participants' verbal responses to a series of questions that were subsequently coded by the researchers using a 4-6 point scale. Comparatively dichotomous thinking was measured via a psychometrically designed scale, a new scale designed specifically for the study called the Dichotomous Thinking Scale (DTS). It consisted of 16 self-report questions to be answered on a 4-point Likert scale, and a subsequent study found it to be a reliable and valid psychometrically based scale (Byrne, Allen, Dove, Watt, & Nathan, 2008). On critical review of this research it can be argued that there is a significant discrepancy between how Byrne et al. (2004) measured the psychological factor of dichotomous thinking, the only factor to be measured using a formal psychometric technique, compared to all the other psychological factors they measured including the emotional eating factors of avoidance eating and comfort eating. As a consequence it could be argued that the underlying psychometric proprieties of the discrepant measurement techniques as opposed to the real predictive power of the other psychological factors produced the result which was not consistent with earlier findings.

Given the strength of the study's overall design it is possible that Byrne et al. (2004) might have found additional significant relationships between psychological factors and weight loss maintenance, if more psychometrically reliable and valid measures had been employed. Specifically, in terms of exploring the predictability of emotional eating this study represents an opportunity lost because reliable and validated psychometric measures of emotional eating were available at the time this research was executed, for example the widely used Dutch Eating Behaviour Questionnaire (DEBQ: van Strien et al., 1986). With such compelling prior findings regarding the potential predictive value of emotional eating reported in Byrne (2002) and Byrne et al. (2003), the Byrne et al. (2004) study provided an ideal opportunity to measure emotional eating using a previously validated psychometrically sound measure of emotional eating. In fact Teixeira, Going, Sardinha and Lohman (2005)

cited in their review paper that the underemployment of psychometrically sound measures within the literature pertaining to predictors of weight control is a problem.

In addition to this significant flaw, other limitations that are analogous to those mentioned for the earlier studies reviewed are present and include the generalisability of the findings as the participant sample was characterised by middle-aged, married, Caucasian women. The sample was also restricted to women who attended one of two commercial weight loss clubs and so were not representative of a broad community-based sample. The sample size is also relatively small for a project that received funding from several sources. It is also noteworthy that the follow-up weight measurement was self-report weight, and although previous research has shown that actual and self-report weight are highly correlated, considering that weight was the primary outcome measure, it would have strengthened the research if the researchers or a third party had weighed participants. In spite of its limitations, Byrne et al. (2004) provides invaluable information regarding the predictors of successful weight loss maintenance, and importantly the flaws in the research provide direction for improvements in future research designs. Most significantly, the results taken within the context of the study's flaws indicate that the potential predictive value of emotional eating cannot be discarded, but instead remains a viable factor to be evaluated as a factor within future research exploring yet to be explained variances within the weight loss maintenance equation. Taking the findings of Byrne et al. (2004) in the context of the limited subsequent research engaged in within this specific area since 2004, there is a possibility that the results of Byrne et al. (2004) were under critiqued by other researchers and that the potential predictive value of emotional eating in the weight loss maintenance equation were accepted as insignificant and not worthy of further attention. This claim is evidenced by there being only one study, and that is a review, that in any way addresses this area between 2004 and 2009. The amount of research improves somewhat from 2009. Between 2009 and the final

writing of this thesis in 2014, three intervention studies, four papers from or affiliated with the NWCR, and three review articles were published that provide evidence of an association between emotional eating and weight loss maintenance. These publications are reviewed next and provide validity to the idea first articulated in 2009, and explicated here, that further exploration of emotional eating and weight loss maintenance is a worthwhile research endeavour.

2.6.4.1 *Emotional eating and weight loss maintenance: empirical publications since 2004.* In 2005, Elfhag and Rossner published a conceptual review of the literature and attempted to synthesise a variety of potential factors that predict successful and unsuccessful weight loss maintenance. They concluded that successful weight loss maintenance was associated with adherence to healthy behavioural strategies such as healthier eating, eating breakfast and having a physically active lifestyle. They also concluded that successful weight loss maintenance was associated with “overall more psychological strength and stability” (p. 67). Conversely, unsuccessful weight loss maintenance was impacted by the factors of “eating in response to negative emotions and stress and more passive reactions to problems” (p. 67). They concluded by stating that “it seems that approaching the issue of weight control from a psychological viewpoint could give a better understanding of obesity behaviours” (p. 78). A strength of the review is that it appears to be very comprehensive and factors extracted are consistent with previous publications. A limitation is that there are no real decisive conclusions or clear recommendations about treatment avenues or options to improve weight loss maintenance, with the reason cited being that “there is too much complexity to allow simplified recommendations” (p. 77). Whilst this explanation is acceptable, it could be argued that it is time for clearer recommendations to be extracted from the literature so that treatment options can be improved. It seems that within this area there is an emphasis on

hypothesis generation without much hypothesis confirmation being attempted. The next three publications reviewed are an exception to this observation.

In 2009, Keranen et al. conducted a randomised follow-up study called the Life Style Intervention Treatment Evaluation (LITE), the primary aim of comparing two weight loss programs: 1) an intensive counselling intervention, 2) a short-term counselling intervention. Simple randomisation without block design was used to randomise participants to either group with $N = 49$ included in the data analysis. The study duration was 18 months with follow-up visits at 6, 12 and 18 months. Both interventions contained similar dietary and traditional behavioural strategies based content. The intensive counselling intervention included both individual and group sessions presented bi-weekly for 20 weeks and was facilitated by a clinical nutritionist. The short-term counselling consisted of two individual sessions conducted by a nurse. The measures included height, weight and waistline circumference measured by a nurse, binge eating, emotional eating, cognitive restraint and uncontrolled eating, as measured by the Three Factor Eating Questionnaire 18 item revised version (R-18) a psychometrically validated measure (Karlsson, Persson, Sjostrom, & Sullivan, 2000). Initial data analysis showed that both groups showed improvements in eating behaviour and weight loss with no significant differences between the two interventions. As a result the data was pooled and successful and unsuccessful weight loss maintenance differences were explored instead. Participants were grouped into four categories:

- 1) successful weight loss maintenance (sustained at least 5% of initial weight loss,
- 2) moderate success (sustained at between 0.5% - 4% of initial weight loss, 3) no maintenance, 4) no weight loss or maintenance.

The results revealed that at the 18 month follow-up, the successful group was significantly differentiated from the other groups by higher cognitive restraint, and lower binge eating, uncontrolled eating and emotional eating. The inverse was true for unsuccessful weight loss maintenance. With specific regard to

emotional eating, the data revealed that it was able to significantly differentiate unsuccessful weight loss maintainers from the other groups. Strengths of the study are that it was a randomised control trial (RCT), it included psychometric measures and it had a substantial follow-up period. The results however, are again, hypothesis generating not confirming and the sample size is modest. The results do, however, contribute to the growing knowledge about weight loss maintenance, and specifically add to the evidence that emotional eating can differentiate successful and unsuccessful weight loss maintenance. As an aside, the results also show that short-term interventions may be a viable option for interventions, although further work needs to be done to confirm this.

In the next study, Teixeira et al. (2010) conducted a study to identify mediators of change at 12-month and 24-month follow-up in previously overweight and obese women who engaged in a 12-month behavioural based treatment program ($N = 225$). Participants were randomised to 1) the intervention condition which consisted of 30 group sessions over 12 months and was based on Self-Determination theory of change, 2) the control condition which received a general health education program (length not reported). The eating behaviours measured were cognitive restraint, defined as “conscious attempts to monitor and regulate food intake”, disinhibition, defined as “uncontrolled eating in response to cognitive or emotional cues”, perceived hunger, defined as the “extent to which respondents experience feelings of hunger in their daily lives”, flexible cognitive restraint, defined as “associated with low emotional and disinhibited eating”, and rigid cognitive restraint, defined as “associated with a more dichotomous, all-or-nothing eating pattern and with higher disinhibition” (Teixeira et al., 2010, p. 726). These constructs were all measured using the 51-item Eating Inventory, also known as the Three-Factor Eating Questionnaire (Stunkard & Messick, 1985). In addition emotional eating and external eating were measured using the Dutch Eating Behaviour Questionnaire (van Strien et al., 1986). Seven exercise variables and

four body image variables were also measured. At the end of the intervention, at 12 months, all 19 variables except one, exercise self-efficacy, changed in the expected direction for the intervention group and were significantly different to the control group. Regarding emotional eating specifically the intervention group experienced a significant improvement compared to the control group at the $p < .001$ level. Further, partial correlation analyses showed that “cognitive restraint and emotional eating, as well as several body image variables remained the most predictive factors of weight change, regardless of group membership” (Teixeira et al., 2010, p. 730). Two multiple regression analyses were also conducted, one for eating related variables and one for exercise related variables. Twelve month weight change was regressed on the eating related variables; the only significant and independent predictors were flexible cognitive restraint ($\beta = -.24, p < .001$) and emotional eating ($\beta = 0.21, p = .001$). One of the major strengths of this research is that mediation analysis was conducted. With regard to the 12-month weight change model mediation analyses showed that together “lower emotional eating, increased flexible cognitive restraint, and fewer perceived exercise barriers mediated 12-month weight loss ($r^2 = 0.31, p < 0.001$; effect ratio: 0.37)” (p.725), although perceived exercise barriers were not independently significant. The effect ratio can be interpreted as meaning that 37% of weight change can be attributed to these three variables. The 24-month follow-up analyses showed that flexible cognitive restraint and exercise self-efficacy mediated 24-month weight loss maintenance ($r^2 = 0.17, p < 0.001$; effect ratio: 0.89).

The authors concluded by saying that “weight loss interventions in women should focus on reducing emotional eating and promoting a flexible, non-dichotomous eating self-regulation approach” (p. 734) but qualifies that exercise self-efficacy seems to be the best predictor of longer-term weight loss maintenance according to their results. As highlighted by the authors, a novel finding within these results is that flexible cognitive restraint was found to be important within the weight loss maintenance equation. The authors describe flexible

cognitive restraint as involving less internal pressure to diet, and a more balanced approach to diet and exercise as compared to the traditionally measured cognitive restraint or rigid cognitive restraint factors which respectively are characteristic of more persistent and “conscious attempts to monitor” and are “associated with a more dichotomous, all-or-nothing eating pattern and with higher disinhibition” (p. 726). The authors provide a brief review of the emerging cumulative literature showing that flexible cognitive restraint may be an underlying psychological mechanism that may provide variance within the weight loss and weight loss maintenance equation. They also articulated that flexible cognitive restraint is likely to be advantageous to longer term weight loss compared to rigid and restrained eaters who have a tendency to be unable to accommodate lapse in weight loss behaviours and so decompensate and abandon workable weight loss behaviours getting stuck in dichotomous all or nothing thinking and behavioural patterns resulting in relapse. People with flexible cognitive restraint are more likely to be able to accommodate a lapse and avoid relapse by recommitting to workable weight loss maintenance behaviours. Their finding that flexible cognitive restraint is helpful within the weight loss maintenance equation is analogous to the earlier finding by Byrne (2004) that the inverse of this, a dichotomous thinking style, adversely impacts individuals’ weight loss maintenance efforts. The study by Teixeira et al. (2010) has a number of strengths including that it is a prospective RCT that used psychometrically developed measures with a respectable sample size. The study also included a control group, a one year follow-up period and also employed sophisticated data analyses. There are some limitations of the study however. A significant limitation is that the original 51-item version of the Three Factor Eating Questionnaire was employed which was developed in 1985 as opposed to the revised 18 item revision published in 2000 (Karlsson et al., 2000). Karlsson et al. (2000) were unable to replicate the original three factor structure (cognitive restraint, disinhibition, hunger) and three new factors were validated: emotional

eating; cognitive restraint; and uncontrolled eating. There is no information provided as to why the original version was used as opposed to the revised version. Conversely, the inclusion of a psychometrically validated scale that specifically measures emotional eating is a significant strength. This is because often emotional eating is not measured using a psychometrically valid measure, or it is subsumed within a scale that measures related yet distinct constructs which result in conceptual and measurement overlap and act to obscure the opportunity to find unique variance that emotional eating may add to the weight loss maintenance equation. For example emotional eating is often only measured using the commonly used disinhibition scale of the Three Factor Eating Questionnaire as found in this study. This measure is problematic however as it has been described as including “emotional eating items” and also including items that “describe dichotomous thinking” (Niemeier et al., 2007, p. 2490). This anomaly is discussed in more detail when the work of the NWCR is reviewed below. With specific regard to Teixeira et al. (2010) however, measuring emotional eating separately suggests an unstated understating that emotional eating and disinhibition are related yet distinct psychological constructs. More generally, and again similar to earlier research presented, the generalisability of the results are restricted to the sample population, i.e. women aged between 25-50 years old. It is also noteworthy that the intervention was one year long and although the financial costs of the program were not reported, common sense would imply that such an intervention would involve high costs and in turn limit the practical implications for public health settings. Despite its limitations this study is important because it is a recent intervention that included a specific emotional eating measure that was shown to be predictive of weight loss maintenance.

The third publication using a prospective design saw Neve et al. (2011) use data from the commercial web-based weight loss program The Biggest Loser Club Australia to explore behavioural factors that are associated with long-term weight loss success. Participants in this

study were people already subscribed to the 12-week program who agreed to be contacted for enrolment in the study when they joined the program ($N = 5625$). Participants paid membership subscriptions in durations of either 1, 3, 4, 12 months. The intervention content was reported to be based on “key evidence-based weight management strategies with features that align with social cognitive theory including self-management, social support, self-efficacy, outcome expectations and expectancies and perceived barriers” (p. 1300). Follow-up occurred at 15 months ($N = 677$). The measures included dietary intake, eating behaviours, physical activity, self-monitoring socio-demographic characteristics, self-report height and weight, and geographic location. The Three Factor Eating Questionnaire – R18 (Karlsson et al., 2000) was employed to measure uncontrolled eating and emotional eating. Overall 22 factors were analysed; 19 of them can be classified within the aforementioned paradigm of traditional behavioural strategies with only dietary restraint, uncontrolled eating and emotional eating constituting psychological factors. At follow-up people who lost and maintained at least 5% of their initial body weight were classified as successful weight loss maintainers and constituted 37% of the participants. The initial analysis constituted simple comparisons between successful and unsuccessful weight loss maintenance groups. T-tests and the nonparametric equivalents were used to find significant comparisons at the $p < .01$ level. The results showed that compared to unsuccessful weight loss maintainers, successful weight loss maintainers were characterised by more self monitoring of weight, dietary intake and exercise, and more fruit and vegetable consumption. The characteristics that were significantly lower for successful weight loss maintainers compared to unsuccessful maintainers were (a) less skipping of meals, specifically breakfast; (b) less snack food kept at home; (c) less consumption of takeaway food and soft drink. Further, successful weight loss maintainers elicited significantly lower scores for dietary restraint, uncontrolled eating and emotional eating compared to unsuccessful maintainers. To find associations between the

factors measured and successful weight loss maintenance stepwise univariate logistical regression analyses were employed with 8 variables controlled for in the first step and were (a) gender, (b) age, (c) baseline BMI, (d) total membership days and days since last membership, (e) number of other weight loss strategies (f) satisfaction with the intervention. After this six factors were found to significantly predict successful weight loss maintenance at $p < .002$. Four factors described as behavioural strategies and were (a) self monitoring of weight more than monthly but less than weekly, (b) eating less takeaway food, (c) no skipping of meals, (d) and no snack food stored in the house. Two factors were classified as psychological strategies and were (a) higher dietary restraint, and (b) less emotional eating, odds ratio .84, $p < .001$. More specifically it was reported that “for each 1 point increase in the emotional eating score, the likelihood of being successful [in weight loss maintenance] decreased by 16 %” (p. 1307).

There are a number of strengths of this study. First it accesses a commercial weight loss intervention which is perhaps more indicative of real world implementation and compliance than research trials. Conversely, it seems that a heterogeneous subgroup within the population agreed to participate and is consistent with those who participate for weight related research trials; the sample was predominately female (88%), Anglo-Saxon, and lived in major cities (73%), and the mean age was $m = 38.3$. The most significant strength of the study was that it was a prospective study and despite not being a RCT the sample is representative of people who have difficulties with their weight and self-refer to commercial weight loss programs which are the most widely available and accessible form of treatment for the majority of the population in Australia. It also used some psychometrically validated measures. The authors also employed robust statistical analysis techniques and controls for numerous variables. One limitation is that of the 5625 people who agreed to participate in the research there was only a 15% response rate at follow-up which means that the sample may

not be a true representation of successful or unsuccessful weight loss maintenance. Another limitation is that all measures including height and weight were self-reported. As highlighted earlier, although self-report weight has been found to be correlated with actual weight, self-report weight is likely not to be as accurate as researcher measured weight. Despite strong statistical techniques employed, data at 15 months was analysed cross-sectionally with no pre-post analyses of the factors found to be associated with successful weight loss analysed. This means that the researchers were unable to determine if success could have been predicted at baseline; for example, it is possible that people scoring lower on the emotional eating scale at baseline were more likely to be categorised as successful weight loss maintainers or conversely, during the intervention people learnt to change their level of emotional eating which saw them move into the successful weight loss maintenance category. By not including pre-post analyses the interpretive implications about the interventions mechanisms of action act to limit future research treatment refinements to improve outcomes. Despite the limitations however this study provides further details about the behavioural factors that influence weight loss maintenance and are consistent with the broader evidence base (Thomas, Bond, Hill, & Wing, 2011). It also provides evidence that emotional eating is a psychological factor associated with weight loss maintenance within a large Australian sample and given its recency it is a current representation of an Australian sample, within the context of limited Australian samples. Neve, et al. (2011) concluded in part that strategies to assist individuals to manage emotional eating are required. This is a sentiment echoed by the cumulative evidence coming out of the NWRC, which is detailed next.

As mentioned earlier, the NWCR is the largest prospective investigation of long-term successful weight loss maintenance. The cumulative empirical evidence from the NWCR does support the empirical link between emotional eating and weight loss maintenance. However, in its academic publications, the NWCR rarely uses the term ‘emotional eating’.

Conversely, affiliates do use the term ‘emotional eating’ in less formal publications; for example in an interview conducted by ScienceDaily, NWCR author Heather Niemeier stated that “amongst successful weight losers, those who report emotional eating are more likely to regain weight” (ScienceDaily, 2007). Similarly in a short article in American College of Sports Medicine’s Health and Fitness Journal, NWCR authors Thomas et al. (2011) state that successful weight loss maintainers exhibit “higher levels of control over their eating and they rarely overeat in response to internal (e.g. emotional) or external (e.g. availability of highly palatable food) cues” (p. 10). In the NWCR academic publications, the terms that are used instead of ‘emotional eating’ are ‘internal disinhibition’ or before 2007 ‘disinhibition’ (Niemeier et al., 2007, p. 2485). In 2007, Niemeier et al., consolidated the available NWCR data and found that internal disinhibition predicted weight regain where internal disinhibition was defined as “eating in response to internal cues such as feelings and thoughts” (p. 2485). The specific findings disclosed in Niemeier et al. (2007) contribute to the evidence of a relationship between emotional eating and weight loss maintenance for example “higher levels of internal disinhibition on entry into the registry predicted more weight regain in the first year of membership” (p. 2490). They also reported that “each additional point on the internal disinhibition scale predicted an increase of 0.26 kg over the year” (p. 2490); and “importantly, baseline internal disinhibition predicted weight change over time above and beyond other psychological constructs including depression, binge eating, and perceived stress in the NWCR” (p. 2492). The analyses of the data by Niemeier et al. (2007) also confirmed their colleagues earlier findings. For example McGuire et al. (1999) reported that “those who gained weight by the 1-year follow-up had, at initial assessment, reported a higher level of dietary disinhibition” (p.180). Similarly, Wing and Phelan (2005) found that “participants who had fewer problems with disinhibition were 60% more likely to maintain their weight over 1 year” (p. 224s). In considering the NWCR data as contributing to

explicating the relationship between emotional eating and weight loss maintenance, it needs to be acknowledged that their measurement of internal disinhibition and disinhibition probably do not provide a pure measure of the emotional eating construct. This observation is based on the description in Niemeier et al. (2007) of the internal disinhibition scale where they say it includes “emotional eating items” and also includes items that “describe dichotomous thinking” (p. 2490). This disclosure suggests the NWCR measures of internal disinhibition/disinhibition may be confusing the measurement of two related yet distinct psychological constructs in emotional eating and dichotomous thinking. This line of thought is supported by the recent findings of Teixeira et al. (2010), as outlined earlier, showing that when measured separately emotional eating and flexible cognitive restraint, the inverse of dichotomous thinking, account for unique significant variance within the weight loss maintenance equation. This means that the disinhibition scale may be obscuring interpretations of the unique variance these related yet distinct variables may have to offer. This observation does not render the NWCR findings as irrelevant; instead it acts to emphasise the importance of acknowledging that there may be conceptual and measurement overlap within the internal disinhibition and disinhibition measures and that emotional eating may be a stronger predictor in the weight loss maintenance equation than currently thought. Further limiting the evidence from the collective NWCR literature is that the original Three Factor Eating Questionnaire-R51 (also called the Eating Inventory: Stunkard & Messick, 1985) has continued to be employed after the revised scale became available in 2000 which elicited new factors. The reasons for this are not explained but can be assumed to be related to the continuity of data comparison that would be complicated if the measure were changed. Again this does not disqualify the NWCR findings it just means that researchers need to be cognisant of nuances in the research that are not overtly present on a brief review of the literature. Notwithstanding these anomalies, the NWCR research findings and the findings by

authors associated with the NWCR contribute further to the evidence that emotional eating may provide predictive value in the weight loss maintenance equation. Presented next is a summary of the more recent NWCR affiliated findings.

Firstly, Wing et al. (2008) reported a “particularly strong association between increases in disinhibition and weight regain”. Wing et al. (2008) conducted an 18-month controlled trial called STOP Regain with a control group and a self-regulation intervention group divided into face-to-face or internet delivery methods involving people who had lost >10% of initial body weight within the last 2 years via non-surgical methods. The intervention group engaged in one session each week for a month and then monthly sessions. The control group received a quarterly newsletter. Behavioural and psychological measures were recorded at 6, 12 and 18 months and included energy expenditure, dietary intake, self-weighing frequency, depressive symptoms measured by the Beck Depression Inventory (Beck & Steer, 1987), and restraint, disinhibition, and hunger measured by the original Three Factor Eating Questionnaire (Stunkard & Messick, 1985). Weight was objectively measured by the researchers on calibrated scales. It is noteworthy to highlight that objectively measured weight is a strength of this research in the context of association with the NWCR because the NWCR usually uses self-report weight. Overall both interventions elicited significant and superior weight change results compared to the control condition, with no significant difference found between each of the intervention conditions. The association models were analysed using linear mixed models. A significant association was found showing that across each group decreases in physical activity were related to weight regain, and within the combined intervention groups increases in self-weighing frequency was related to less weight regain. Heavier baseline weight and more weight lost before entering the program were also associated with weight regain. The face-to-face group showed increases in resistance over time and this was associated with less weight regain. The results for the psychological factors

showed that increases in depressive symptoms, hunger and disinhibition were associated with weight regain. Specifically, a standard unit decrease in disinhibition was associated with less weight regain of “1.07kg” (p. 1019). This was described by Wing et al. (2008) as a “particularly strong association between increases in disinhibition and weight regain”, and as a result it was concluded in part that “negative affect and tendencies to uncontrolled eating may be associated with problems of long-term maintenance of weight loss” (p.1020). The strengths of this study include the prospective nature of the study and the analysis that compares baseline to follow-up measure to show changes in factor scores that can then inform treatment refinement of future studies. It thus provides evidence for hypothesis confirmation as opposed to hypothesis generation which characterises much of the previous research within this area. Importantly it includes an objective measure of weight. Note that the findings need to be interpreted knowing which version of the Three Factor Eating Questionnaire was used, which was the original (Stunkard & Messick, 1985). Limitations include the generalisability of the results as again the sample was predominately female (82%), and Caucasian (98%) with a mean age of 51.2 years, and that 10% less people completed the survey than agreed to be weighed at follow-up. However the 83% response rate is respectable. Overall the findings are important because they show that “future programs for weight loss maintenance should focus on modifying these behavioural and psychological variables” (p. 1021).

The next study recognised that the data from the NWCR can only elicit within group comparisons based on successful weight loss maintainers to generate knowledge about factors associated with weight loss maintenance. As a result Phelan et al. (2009) conducted a cross-study collaboration to compare successful weight loss maintainers with treatment-seeking obese individuals ($N = 473$). The aim was to find discriminating factors between successful weight loss maintainers and the treatment-seeking obese on behavioural (e.g.

exercise, eating breakfast), environmental (availability of food and exercise options) and psychological factors (e.g. disinhibition, depressive symptoms). To be eligible participants in the weight loss maintenance category had to have a history of overweight and be currently within the healthy weight range having lost at least 10% of their body weight and maintained at least 5% of that. Participants fulfilling the criteria for the treatment-seeking obese were drawn from two ongoing clinical trials. Measures included dietary intake, physical activity, household food inventory, exercise environment, social support, depressive symptoms, dietary restraint and disinhibition as measured by the original Three Factor Eating Questionnaire (Stunkard & Messick, 1985). Weight measurements were self-reported for the maintainers and researcher measured for the treatment-seeking obese. Univariate analysis showed a number of variables significantly differentiated weight loss maintainers from the treatment-seeking obese and they were higher dietary restraint, higher total number of calories expended per week, more family encouragement of healthy eating and friends participating in healthy eating and less TV watching and lower disinhibition. The findings are consistent with previous research results. The limitations include the self-report weight measurement for the maintenance group and the overall generalisability of the results due to the sample being predominantly female and Caucasian. The cross-sectional nature of the data also precludes any prospective analyses and lends itself more to hypothesis generation than confirmation. In terms of emotional eating, the results showing that lower disinhibition is associated with successful weight loss maintenance does provide cumulative evidence that emotional eating is associated with weight loss maintenance because this scale includes emotional eating items. The most significant strength of the study is the inclusion of behavioural, psychological and environmental factors and acts to consolidate the call for researchers to move beyond only measuring the behavioural factors known to contribute to weight loss maintenance.

Another paper moving beyond what is traditionally explored within this area is the study published by Bond, Phelan, Leahey, Hill and Wing (2009). Using data available from the NWCR, Bond et al. (2009) compared weight regain along with behavioural and psychological characteristics to explore differences between individuals who lost weight via bariatric surgical or non-surgical behaviour change methods. Participants from each group were matched on weight on entry, weight lost and maintained, duration and gender. Measures were analysed at baseline and 1 and 2 year follow-up. Measures included demographics and weight history, dietary intake and physical activity and depression. In addition cognitive restraint, disinhibition and hunger were measured by the original Three Factor Eating Questionnaire (Stunkard & Messick, 1985). The results showed that the groups did not differ in the amount of weight regain over 2 years. There were significant differences in behavioural factors between the groups with the surgical group reporting “less physical activity, more fast food and fat consumption, less dietary restraint, more night eating, and higher depression and stress at entry and 1 year” (p. 173) leading the authors to conclude that non-surgical weight loss maintainers need to work harder to maintain their weight losses. The multivariate regression model showed that regardless of weight loss group, individuals with higher levels of disinhibition, which includes emotional eating, at entry into the study were significantly more likely to regain weight, and in addition the greater the increase in disinhibition over one year, the greater the amount of weight regain at one year follow-up. The results highlight that disinhibition was the only factor predictive of weight regain and that it was equally detrimental to weight loss maintenance in both groups. Strengths of the study include a novel comparison which had not been studied before in the context of weight loss maintenance. Strengths also included the matched participants and the prospective design including the analysis of baseline and follow-up data. Limitations of the study include the self-reporting of weight, and again the generalisability of the sample due to the predominance

of Caucasian females (92%) with the average age of 42 years. A further limitation, which could also be applied to the studies reviewed earlier, is that, despite results showing that emotional eating and analogous factors including disinhibition are related to weight loss maintenance, the findings generally do not provide insight into why and how some people are able to change or limit these behaviours while others are not. This situation makes it hard to implement recommendations such as those outlined by Bond et al. (2009) which include “designing methods to increase resistance to cues that trigger overeating...to assist in prevention weight regain” (p. 179) because the mechanism of actions underlying these behaviours have not actually been elucidated as part of the research. This is where more sophisticated statistical methods could be employed, such as mediation, to drill down to the underlying causes of unhelpful behaviours such as emotional eating. Researchers at the NWCR are in a unique position in being able to access a large data set to facilitate such statistical analyses yet to date mediation analyses has not been a focus of NWCR publications.

Similarly to Bond et al. (2009), Butryn et al. (2009) concluded in part by saying that “teaching strategies for reducing eating in response to internal cues” may improve weight loss maintenance (p. 1101). The Butryn et al. (2009) study was designed to extend the research of Niemeier et al. (2007), as detailed earlier, by extracting the two sub-factors found to be subsumed within the original disinhibition scale of the original Three Factor Eating Questionnaire (Stunkard & Messick, 1985). The aim of the study was to find if changes in internal and external disinhibition found in the “initial phase of weight loss treatment are predictive of subsequent weight loss maintenance” (p. 1101) so to inform refinements in the treatment of obesity. Participants were drawn from a 12 month long weight loss intervention study where behavioural strategies were taught. Between 1-3 months all participants received the same weight loss intervention which was a weekly 15-minute long individual telephone

call. At 4 months participants were randomised to one of four groups for the remaining time (a) standard calorie control, (b) reduced energy density eating, (c) one liquid meal replacement per day, (d) a combination of (a) and (b). At the completion of treatment, attrition was 66% with $N = 81$ available for analyses. The measures included were weight, BMI, demographics, depression and internal and external disinhibition as measured by the original disinhibition scale of the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) and analysed according to the factor structure described in Niemeier et al. (2007). It was found that change in internal disinhibition between 1-3 months significantly predicted weight change for the remainder of the intervention where there was a significant correlation between decreases in internal disinhibition and weight ($r = 0.36, p = .002$). This finding remained significant after controlling for treatment group, baseline weight, depression, internal disinhibition and initial weight loss ($\beta = 0.32, t = 2.17, p = .03$). Conversely, external disinhibition was not a significant predictor.

A strength of this study is that the NWCR affiliated researchers recognised that the original total disinhibition factor as measured by the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) may not be the best measure to help refine knowledge and treatment of obesity. Instead they used a more recently validated factor and in their discussion noted that the internal disinhibition factor of the total disinhibition scale might be responsible for the significance of previous findings. Despite this improvement as already highlighted the internal disinhibition factor as described by Niemeier et al. (2007) transverses two related yet distinct psychological constructs as it includes “emotional eating items” and also includes items that “describe dichotomous thinking” (p. 2490). So again, findings need to be interpreted with this in mind. The conclusion offered by Butryn et al. (2009) that “teaching strategies for reducing eating in response to internal cues” may improve weight loss maintenance is consistent with the research previously reviewed here and with the

current broad NWCR findings (p. 1101). Further to this research the NWCR has also more recently published “Seven Habits of Successful Weight Loss Maintainers” from the cumulative NWCR data, it includes six traditional behavioural factors and one psychological factor and that is emotional eating (Thomas et al., 2011) and they are: “1) high levels of physical activity, 2) limited television watching, 3) low-calorie, low-fat diet, 4) consistent diet; 5) breakfast consumption, 6) high dietary restraint and low disinhibition [NWCR members report exerting high levels of control over their eating, and they rarely overeat in response to internal (e.g., emotional) or external (e.g., availability of highly palatable food) cues], and 7) self-monitoring” (p.10). Over and above the individual studies reviewed here, three recent review papers aim to provide an overview of the current state of the literature regarding weight loss maintenance. These papers are reviewed next.

In 2010, Barte et al., conducted a systematic review ($N = 22$) that focused on the relationship between short-term weight loss and the maintenance of this weight loss at a one year unsupervised follow-up. As a whole what made this review interesting was that the authors reported having difficulty making any decisive conclusions and cited the heterogeneity of available data as limiting the conclusions. For example, the authors found it difficult to delineate why there was considerable variation in percentages of weight loss maintenance reported between studies. One factor they cited as attributing to this was the “poor description of intervention content in different articles” (Barte et al., 2010, p. 903). An important research priority that emerged from the review was “identifying intervention-related predictors and mediators of long-term weight maintenance in behavioural intervention studies with adequate control groups” (Barte et al., 2010, p. 903). It was also recommended that “more research is needed to further elucidate the association between weight loss and maintenance on an individual level...and to establish best practices for an optimal maintenance of weight loss” (Barte et al., 2010, p. 904). The central message from this

review is that more knowledge needs to be developed about the predictors of successful weight loss maintenance, because the current heterogeneity of study methods and outcomes make it difficult to draw definitive conclusions. This general sentiment is echoed in the two other recent review papers.

Stubbs et al. (2011) and Stubbs and Lavin (2013) reviewed the available evidence pertaining to successful weight loss and weight loss maintenance. Initially Stubbs et al. (2011) focused on identifying the predictors and correlates of weight loss and weight loss maintenance, and subsequently Stubbs and Lavin (2013) reviewed the challenges to implementing behaviour changes that lead to sustained weight management. Similar to Barte et al. (2010), Stubbs et al. (2011) found that identifying predictors of successful weight loss maintenance was difficult due to heterogeneous research methods and analyses within the empirical literature. Both of these reviews relied heavily on the evidence provided by the various NWCR or affiliated publications to describe the attributes of successful and unsuccessful weight loss maintainers. Both reviews reiterated that weight loss maintenance remains a challenge for most individuals and that the contributing factors responsible for this involve biopsychosocial reasons. Similar to the NWCR publications these reviews echo the findings that highlight the importance of behavioural strategies for successful weight loss maintenance, for example the monitoring of dietary intake and energy expenditure through physical activity that are also key to initial weight loss. In addition, emotional eating was identified as one factor that is associated with greater relapse or unsuccessful weight loss maintenance. Specifically, Stubbs and Lavin (2013) found that the group of people who “constantly struggled to maintain their weight...struggled more with their emotions” (p. 14). Stubbs and Lavin (2013) also identified that a lapse in behavioural strategies can become a relapse in weight loss maintenance because people “can become trapped in a chaotic emotional cycle which derails strategies of planned behaviour” (p. 15). Stubbs et al. (2011)

concluded in part that “to avoid relapses one has to develop skill and coping strategies in the domains of behaviour and emotion” including “food as a means to cope with emotional perturbations” (p. 700).

A significant part of both these reviews highlight the global limitations of the research pertaining to the predictors of weight loss and weight loss maintenance. The limitations listed by Stubbs et al. (2011) include generalisability of findings because of the samples consisting of either university students or individuals involved in clinic settings and thus do not represent the broader general population. They cite that there is little standardisation of constructs and corresponding operationalised measurements which as a consequence fracture the global understanding of the predictors of successful and unsuccessful weight loss maintenance. It was also observed that empirical measures change over time resulting in the identification of pattern of results more difficult. Overall it appears that often univariate analyses are used which limits practical interpretations and where multivariate analyses have been used often the sample size is too small to employ such statistical techniques. It was also noted that often studies are under-powered, meaning that potential predictors are lost to Type II error. Further attrition is also a significant problem in obesity trials and Stubbs et al. (2011) cite that 37% is the average attrition rate attained in reviewing 121 studies. Despite these limitations psychological factors have emerged as important factors worthy of further investigation and overall the findings that emotional eating may provide variance in the weight loss maintenance equation are limited but consistent. In combination Stubbs et al. (2011) and Stubbs and Lavin (2013) conclude that people need better individualised support to build the capacity to maintain what they know to be healthy choices that facilitate weight loss and weight loss maintenance, and part of this involves addressing emotional eating.

2.7 Interim Summary of the Emotional Eating and Weight Loss Maintenance

Empirical Literature

The research presented in this section highlights that there is limited, yet growing, cumulative evidence showing that emotional eating is significantly related to unsuccessful weight loss maintenance and that this evidence acts to accentuate that emotional eating may be able to explain yet unaccounted for variance within the weight loss maintenance equation. Although as a whole the evidence presented shows a significant association between weight loss maintenance and emotional eating, the overall heterogeneous nature of research, including the methods, measures, and data analysis techniques employed, act to limit any decisive conclusions about emotional eating's predictive ability in the weight loss maintenance equation. One significant limitation is the use of measures that may measure related, yet distinct psychological constructs, and thus conspire to obstruct the variance that emotional eating may account for in the weight loss maintenance equation. For example, an important, yet tangential, finding that emerged whilst exploring emotional eating's association with weight loss maintenance was that the related, yet distinct, psychological construct of dichotomous thinking, and its inverse flexible cognitive restraint, may also account for yet to be explained variance within the weight loss maintenance equation and is worthy of a future review. The limitations observed about each individual study, as well as the limitations listed by Barte et al. (2010), Stubbs et al. (2009) and Stubbs and Lavin (2013) provide a long list of considerations for future research within the weight loss maintenance arena. In no particular order, these include the need for more (a) prospective designs, (b) hypothesis confirming research instead of more hypothesis generating research, (c) controlled treatment intervention trials, (d) pre and post data analyses, (e) researcher measured weight instead of self-report weight, (f) complex data analyses using multivariate techniques to find underlying mechanisms of action, (g) better explanations about the psychometric measures

chosen, (h) standardisation and consensus of the constructs measured, (i) delineation of related yet distinct psychological constructs especially to find the unique variance that emotional eating may account for, (j) Australian samples, (k) homogeneous samples with more power, (l) improved descriptions of treatment intervention content and underlying philosophies, (m) more inclusion of psychological factors in study measures. These points show that there is a lot of work to be done within this area. Despite the collective limitations however, it could be argued that the heterogeneous nature of the research actually acts to strengthen the likelihood that there is a significant relationship between emotional eating and weight loss maintenance because the association consistently emerges as a significant despite the different methods, designs, measures and data analyses employed. Given that emotional eating emerges as a significant factor under many different conditions it is argued here that future research should explicitly measure emotional eating in the context of weight loss maintenance. This notion draws support from the cumulative conclusion made by authors who have ventured into this area of research, for example

- psychological interventions “should focus on reducing emotional eating” (Teixeria et al., p. 2010);
- “continued research on emotional eating appears to be a worthwhile path in addressing...obesity” (Kemp et al., 2011, p. 225);
- “to prevent obesity in the long run, psychological treatment strategies have to be developed to overcome emotional eating and thereby end the weight gain epidemic” (Koenders & van Strien, 2011 p. 1292);
- psychological interventions “should focus on reducing emotional eating” and increasing flexible instead of rigid cognitive restraint (Teixeria et al., 2010, p. 733);

- “there is a need for treatment strategies that not only promote initial weight loss, but also facilitate long-term maintenance of lost weight” (Neve et al., 2011, p.1299);
- “there is a need for maintenance programs that specifically target people who have lost substantial amounts of weight, regardless of how they lost it, and that teach skills specific to the maintenance of weight loss” (Wing, Tate, Gorin, Raynor, & Fava, 2006, p. 1564);
- interventions that teach adaptive coping for weight maintenance may be helpful, and more specifically “that fostering mastery experiences of coping with more adaptive strategies could be a focus for helping emotional eaters” (Andrews et al., 2011, p. 212);
- “the development of unexplored, novel strategies to promote weight loss maintenance is also imperative so that individuals are able to sustain weight loss they work so hard to achieve” (Turk et al., 2009, p. 77);
- “one has to develop skill and coping strategies in the domains of behaviour and emotion” including “food as a means to cope with emotional perturbations” (Stubbs et al., 2011, p. 700);
- “teaching strategies for reducing eating in response to internal cues (Butryn, et al. 2009, p. 1101);
- “design methods to increase resistance to cues that trigger overeating... to assist in preventing weight regain” (Bond et al., 2009, p. 179).

Despite the calls for psychological treatment interventions to target emotional eating one significant shortcoming of the cumulative research which acts as a barrier to treatment refinement is the limited exploration of the mechanisms of action that underlie emotional

eating that would constitute the treatment target. As highlighted in Section 2.6.1, despite the idiosyncrasies of the various theories of emotional eating, collectively avoidance of emotion can be seen as the underlying mechanism of action. This is explored next.

2.8 Elucidating Underlying Mechanisms of Action

Elucidating underlying mechanisms of action are important because they point to tangible targets for treatment refinement. The theoretical assertion that eating is used to avoid emotion has been made throughout this review; however until now limited empirical evidence has been presented elucidating avoidance as the mechanism of action underlying emotional eating. The next two publications reviewed provide compelling empirical support to validate earlier published conclusions including that of Kayman et al. (1990) which state that it is not the amount or type of stress or emotion that people experience that impacts successful weight loss maintenance, but *how* people deal or cope with emotion and the extent to which eating is employed as a coping strategy to deal with emotion that is central to weight loss maintenance. The evidence from these two publications act to inform treatment refinement, which forms the discussion to follow.

2.8.1 Emotional eating: a result of avoidant and unhelpful emotion regulation and coping strategies. The cumulative evidence suggests that people who engage in emotional eating are doing so because more helpful, adaptive or functional emotion regulation and/or coping strategies have eluded them in the face of aversive emotional arousal, and instead they use avoidant types of coping involving eating. Two publications explicate this empirically.

The exploration of the relationship between negative affect, coping and emotional eating by Spoor, Bekkerb, van Strien and van Heck (2007) resulted in the finding that “negative affect did not have a unique contribution to emotional eating over and above emotion-oriented coping and avoidance distraction” (p. 373). In plain language that means

that the experience of negative affect does not predict emotional eating and instead unhelpful avoidant style coping does predict emotional eating. They concluded that “emotional eating is related to reliance on emotion-orientated coping and avoidance strategies” (p. 396). The study constituted a cross-sectional design. Participants ($N = 157$) were eating-disordered women ($n = 125$) drawn from Dutch mental health clinics and a community sample of non-disordered eating women ($n = 132$). Measures included negative affect, as measured by the Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988), and emotion-orientated coping, task-orientated coping and avoidance-orientated coping where avoidance had two subscales social diversion and avoidance distraction as measured by the Coping Inventory of Stressful Situations (de Ridder & van Heck, 2004). Emotional Eating was measured by the Emotional Eating Scale of the Dutch Eating Behaviours Questionnaire (DEBQ: van Strien et al., 1986). Hierarchical regression analyses showed that “emotion-oriented coping and avoidance distraction were strongly related to higher levels of emotional eating” in both groups (p. 372) and that when these variables were included in the model negative affect was not related to emotional eating. In their discussion it was proposed that the relationship between negative affect and emotional eating may be indirect through coping, however mediation analysis was not conducted. Spoor et al. (2007) conclude by stating that their results confirm the psychosomatic theories of emotional eating and stated that “overeating results from inadequate affect regulation and escape from negative emotions” (p. 373) and that “the findings suggest that emotional eating is related to reliance on emotion-orientated coping and avoidance distraction” (p. 368). The limitations of the study include the cross-sectional method and simple data analyses. The strengths of the study include the use of a specific reliable and valid emotional eating scale and attaining a heterogeneous sample group. The main strength within the context of this literature review is that this study is one of few studies to show empirically that emotional eating may be a result of avoidant type coping and

that avoidance may be the mechanism of action underlying emotional eating. This is important because identifying underlying mechanisms of action point to factors that can be targeted in research treatment trials, and in this case it points to avoidance as a therapeutic treatment target. The experiential study published by Evers et al. (2010) provides support for Spoor et al. (2007) and for the theory that avoidance underlies emotional eating and is detailed next.

Evers et al. (2010) hypothesised that it is the “way in which negative emotions are regulated that affect food intake rather than negative emotions per se” (p. 794). To test their hypothesis, they conducted three consecutive and interrelated experimental studies that compared food intake and adaptive and maladaptive emotional regulation strategies in conjunction with emotion induction. Emotions were induced by participants recalling recent emotional autobiographical life events (Study 1) or by watching an emotional film excerpt (Studies 2 & 3). Bogus taste tests were used to assess actual food intake, both comfort foods (caloric and highly palatable food) and non-comfort foods were also included. Across the three studies participants were asked to use one of three types of emotional regulation strategies 1) reappraisal was employed as the adaptive emotion regulation strategy, 2) suppression was employed as the maladaptive emotion regulation strategy, and 3) spontaneous expression was the control condition.

Study 1 explored simple individual differences in the use of suppression and cognitive reappraisal on food intake after emotion induction to test the hypothesis that “emotion regulation strategies predict increased food intake” (p. 796) and food intake is not related to the experience of emotion per se. Participants ($N = 37$) were female university students who were divided into two groups; 1) emotion condition ($n = 19$), 2) control condition ($n = 18$). Participants in the emotion condition were asked to recall a personal event that made them feel sad, and participants in the control group received similar instructions but were asked to

recall a regular daily event. The measures included actual food consumption and sadness after the emotion induction, emotional, external and restrained eating as measured by the Dutch Eating Behaviors Questionnaire (van Strien et al., 1986), and expressive suppression and cognitive reappraisal as measured by the Emotional Regulation Questionnaire (Gross & John, 2003). Hierarchical regression analyses were employed and showed that at step 3 after age, BMI and condition were entered in Steps 1 and 2, the only significant result was the interaction between suppression and condition ($\beta = .64, p = .021$). Post hoc simple slopes were generated and showed that higher scores on suppression were associated with increased food intake in the emotion condition. This result acted to confirm that individual differences in emotion regulation strategies impact food intake, and more specifically unhelpful regulation strategies are associated with increased food intake. This result formed the basis for more complex exploration in Studies 2 and 3.

Study 2 extended Study 1. All participants ($N = 44$) watched a film excerpt that induced emotion, however before they commenced watching they were given instructions about how to watch the excerpt so as to include a manipulation of suppression and reappraisal. Participants ($n = 22$) in the suppression condition were instructed to hide any emotional responses in a way that no one would be able to tell they were watching something emotion inducing. Participants ($n = 22$) in the reappraisal condition were instructed to watch from an objective stance and pay attention to technical details remembering that what they were watching was a story. The measures included were assessment of negative affect pre and post emotion induction, actual food intake of comfort and non-comfort type foods, emotional, external, and restrained eating. The results showed that there was no difference between the groups in terms of emotion induction with both groups experiencing an increase in negative emotion. The results also showed that each group used the regulation strategy they were instructed to use, and that the suppression group consumed more comfort food.

There was no difference for non-comfort food. The authors conclude that “there was no effect of emotions per se on food intake” (p. 798), but that the results suggest that the unhelpful emotion regulation strategy of suppression is responsible for increased food intake compared to reappraisal. Study 3 extends this study by including a control condition.

In Study 3 a ‘no regulation’ control condition was added to test “whether suppression promotes or reappraisal dampens increased eating” (p. 798). Participants were 62 female university students divided into three groups: 1) suppression ($n = 21$), 2) reappraisal ($n = 20$), 3) no regulation/control ($n = 21$). Participants in the control condition were simply instructed to watch the film. Measures mirrored Study 2. The results showed that all three groups similarly experienced increases in negative emotion after emotion induction. With regards to food intake the results showed that those subjected to the suppression condition ate significantly more comfort food than the other two conditions. The reappraisal and control conditions did not differ. Hierarchical regression showed that negative emotions did not predict any of the consumed food. In summarising the results of Study 3, the authors state that the results “indicate that applying maladaptive emotion regulation strategies is responsible for increased eating. Again, emotions per se did not affect food intake” (p. 800). Overall, the study by Evers et al. (2010) is extremely important in furthering empirical knowledge about the potential mechanisms of action underlying emotional eating. As highlighted by the authors this study represents a “promising first step regarding emotion regulation strategies as an explaining mechanism behind emotional eating” (p. 801) and in addition “implies that emotional experience per se is not necessarily associated with overeating” (p. 801). The findings have significant practical implications for treatment because they point to unhelpful avoidant style strategies as a therapeutic target. The main strengths of this study is its experiential design and the aim of exploring the mechanisms of action underlying emotional eating so as to inform treatment refinement. Limitations of the

study are not dissimilar to aforementioned studies; specifically only females were included and they were university students. The sample size was also small, especially for the hierarchical analyses that were employed. Notwithstanding the limitations of this study the findings act to inject hope into the emotional eating and weight loss maintenance equation because as the authors explain “although it may sometimes be impossible to avoid experiencing negative emotions, it may be possible (though perhaps complicated) to change the way we regulate emotions and thereby remove an important instigator of emotional eating” (p. 801).

Together the findings from Spoor et al. (2007) and Evers et al. (2010) act to provide empirical evidence that supports the a prior theoretical knowledge that emotional eating is a result of avoidant and unhelpful emotion regulation and coping strategies. Coupling these findings with the previous knowledge conspires to produce strong support for the targeting of avoidance through a psychological treatment intervention to improve emotional eating and weight loss maintenance. In early 2009, at the time that this line of investigation was articulated, there was only one intervention treatment trial published that used a novel psychological treatment to explicitly target avoidance as an unhelpful strategy in the context of weight management including the measurement of weight loss maintenance (Lillis et al., 2009). This treatment trial is reviewed in detail next.

2.8.2 Avoidance as an explicit psychological treatment target for weight: toward a treatment intervention for emotional eating. Lillis et al. (2009) constituted a randomised trial exploring the effectiveness of a 1-day Acceptance and Commitment Therapy (ACT, said as one word not as separate letters A-C-T) treatment intervention targeting a reduction in avoidance to in part augment weight control efforts. The impetus for the study came from the recognition that psychological factors in the context of weight were under researched, and that the cumulative research showed “that individuals who are unable to

maintain weight loss tend to have a narrow range of coping skills” and that “when exposed to stress of negative emotions they tend to use avoidant or impulsive styles of coping”, and conversely people who are able to maintain weight losses tend to be more active and “flexible” in their adjustment style (p. 59). Lillis et al. (2009) proposed that instead of using traditional behavioural based treatment interventions, psychological treatment methods “designed to teach acceptance and mindfulness skills for difficult thoughts and feelings may be more helpful, perhaps particularly so for those who are generally avoidant and psychologically inflexible” (p. 59). To test their proposition Lillis et al. (2009) conducted an exploratory RCT to examine whether a 1-day psychological treatment intervention using an ACT workshop “using obesity stigma as the focus, could improve obesity stigma, general health, and quality of life, while also augmenting weight control efforts by increasing acceptance, mindfulness, and values-based action” (p. 60). Participants ($N = 84$) were individuals who had engaged in a structured weight loss program within the last 6 months. They were randomly assigned to 1) the treatment condition, 1-day, 6-hour, ACT workshop intervention ($n = 40$), or 2) to the wait-list control condition ($n = 44$). Lillis et al. (2009) described the ACT treatment intervention as targeting experiential avoidance through focusing on acceptance, mindfulness and values and to teach people how to “reduce patterns of avoidance and increase psychological flexibility” with the goal of the workshop presented to participants as learning to “live more fulfilling lives consistent with their chosen values” (p. 61). By targeting experiential avoidance, Lillis et al. (2009) hypothesised that avoidant behaviours would reduce and psychological flexibility would increase, which would augment weight control efforts. The intervention purposely and explicitly did not involve any focus on behavioural weight control strategies because the proposed mechanism of action was via the level of experiential avoidance, instead of direct improvement in weight control strategies per se. Lillis et al. (2009) cited support for their rationale from earlier studies that show that ACT

has been shown to be effective through targeting experiential avoidance for a broad range of health concerns (Hayes, Luoma, Bond, Masuda, & Lillis et al., 2006; Hayes et al., 2012). The outcome measures included were: weight, BMI, distress, quality of life and obesity related stigma measured respectively by the General Health Questionnaire (GHQ: Goldberg & Williams, 1988), the Obesity Related Well-being Questionnaire (ORWELL: Mannucci et al., 1999), and the Weight Stigma Questionnaire which was designed specifically for this study. The process measures, or underlying mechanism of action, was experiential avoidance which was operationalised using two separate questionnaires 1) the Acceptance and Action Questionnaire (AAQII: Bond et al., 2011); and 2) the Acceptance and Action Questionnaire for Weight (AAQW: Lillis & Hayes, 2008). In addition, a measure of breath-holding was used as an objective measure of distress tolerance. Baseline (pre) and 3-month follow-up (post) measurements were taken.

The results show that at 3-month follow-up those who received the ACT treatment intervention showed significant improvements on all outcome variables. In comparison, the control group did not show any significant improvements at 3-months except for breath-holding. Lillis et al. (2009) used mediation analysis to explore their hypotheses that experiential avoidance fulfilled the underlying mechanism of action role in the improved outcomes for those who received the ACT intervention. These results show that weight related experiential avoidance (AAQW) mediated the change in all outcomes. General experiential avoidance (AAQII) only mediated changes in psychological distress, quality of life, and stigma. Notably, 35% of people who received that ACT intervention lost 5 pounds (2.3 kg) or more, and only 7% gained 5 pounds (2.3kg) or more. Comparatively, 25% of people in the control condition gained 5 pounds or more and only 11% lost 5 pounds or more. These differences were statistically significant and unexpected as weight maintenance, not weight loss, was targeted. As such Lillis et al. (2009) conducted statistical analysis to identify

whether the significant positive results for the ACT condition were an artefact of actual weight loss. They found that unexpected weight loss was not responsible for the positive results in other outcome variables, and the significant mediation of the weight related experiential avoidance remained. Lillis et al. (2009) conclude by stating that even a brief ACT intervention, that does not focus on weight control per se, appears to be efficacious in targeting avoidance and that the results show that further research is warranted in exploring ACT and weight maintenance.

This study includes limitations that are mentioned for most of the earlier studies reviewed and include the generalisability of the findings due to the homogeneity of the sample, including middle-aged, Caucasian (91%), females (90.5%). A major strength of the research is the inclusion of mediation analyses to measure the proposed underlying mechanism of action. This is important in the context of this literature review because the results of this research show that a 1-day ACT intervention was able to change scores on avoidance to augment weight control efforts. An interesting limitation of the study is that it mentions that eating in response to emotions is related to obesity; however it does not measure it. Including an emotional eating measure into this study could have provided valuable insight into the association between emotional eating and weight loss maintenance including insights into the underlying psychological mechanisms of action. Despite this omission the results nonetheless provide a foundation to explore ACT's effectiveness in decreasing emotional eating. Overall the results of Lillis et al. (2009) suggest that it is possible that a 1-day ACT treatment intervention that targets emotional eating's theoretical underlying mechanisms of action, avoidance, may be effective in decreasing emotional eating and improving weight loss maintenance.

2.9 Chapter Summary: Overweight and Obesity, Weight Loss Maintenance and Emotional Eating

The rise in the prevalence of overweight and obesity throughout developed nations including Australia is problematic because together they are recognised as risk factors in mortality and morbidity, and have significant consequences for individuals, their families and society more broadly. The antidote to overweight and obesity is weight loss. When weight loss is achieved, however, that does not automatically ameliorate the adverse health outcomes of overweight and obesity. It is only through successful weight loss maintenance that improved health outcomes are realised. Evidence shows that while most people can lose weight, maintaining weight loss remains a considerable challenge and unsuccessful weight loss maintenance is the norm, with some researchers stating that unsuccessful weight loss maintenance after weight loss is one of the greatest challenges facing the field of obesity treatment. Finding ways to improve weight loss maintenance is vital because of the high morbidity and mortality associated with being unsuccessful.

Exploration of overt behavioural strategies of balanced dietary intake and physical activity dominate the empirical research and literature and yet a gap still remains pertaining to knowledge about why approximately 80% of people are unable to succeed with their weight loss maintenance. This gap has led some researchers to call for the exploration of psychological factors, that is, an individual's covert internal thoughts and emotions, which may have the potential to explain yet to be accounted for variance in the unsuccessful weight loss maintenance equation above and beyond that explained by overt and objectively measureable behavioural factors. The variance that psychological factors may contribute to the weight loss maintenance equation is a hitherto under explored area with these factors largely overlooked in most treatment programs, as well as in empirical treatment trial research and the empirical literature generally.

Despite the limited research exploring the psychological factors within the weight loss maintenance arena one factor that emerges from the cumulative literature as having the potential to provide variance within the weight loss maintenance equation, is emotional eating. *Emotional eating* is an umbrella term used to describe eating to avoid emotion. Defined as the tendency to eat in response to emotional distress, the function of emotional eating is its ability to help individuals avoid, reduce, regulate or moderate negative affect, emotional distress, or aversive internal emotional states instead of using more helpful and adaptive coping strategies that do not involve food.

Since the initial articulation of this thesis' underlying purpose to explore the variance emotional eating may be able to account for within the weight loss maintenance equation, a number of studies have been published that act to confirm that this line of investigation is worthwhile. As noted earlier six recent publications show that people scoring high on emotional eating are at greater risk of becoming overweight and obese, and evidence of eleven publications has been presented that together provide cumulative evidence of a significant association between emotional eating and weight loss maintenance. The evidence presented is not without its limitations and is characterised by heterogeneous research methods and data analyses, homogeneous samples, and also includes some issues with the psychometric measurements used including conceptual overlap being a problem with some scales. Despite this, within the limited literature exploring the potential of psychological variables in the context of weight loss maintenance when emotional eating is included in the research it is consistently shown to be significantly associated with weight loss maintenance. It is noteworthy that other related yet distinct psychological constructs, such as dichotomous thinking and its inverse flexible cognitive restraint, may also provide variance yet to be accounted for within the weight loss maintenance equation.

Given the limited yet cumulative evidence showing an association between emotional eating and weight loss maintenance there has been a sustained call for treatment studies and interventions alike to target emotional eating for weight loss maintenance to improve outcomes. However there is one significant shortcoming of the cumulative research that until recently has acted as a barrier in refining treatment interventions, and that is the limited empirical exploration of the mechanisms of action that underlie emotional eating. Elucidating underlying mechanisms of action are important because they point to tangible targets for treatment refinement. This gap has recently been addressed however, with empirical experimental results providing confirmative evidence that avoidance style coping, or simply avoidance, is most likely the mechanism of action underlying emotional eating (Evers et al., 2010; Spoor et al., 2007). These findings are significant because they confirm the a priori theoretical understanding that emotion eating *is* driven by avoidance of emotion. The results of Spoor et al. (2007) and Evers et al. (2010) together suggest that it is the application of avoidance-based strategies that are responsible for emotional eating and that emotional eating is not related to the actual experiencing of emotions per se. The cumulative findings have significant practical implications for treatment of emotional eating because all point to *avoidance* as the therapeutic target. Presently the psychological treatment most significantly associated with targeting avoidance is ACT (Hayes, Strosahl, & Wilson, 1999; 2012).

In 2009 Lillis et al. showed that a 1-day ACT treatment intervention that targeted avoidance, as experiential avoidance, significantly improved health related outcome measures and more importantly showed that weight related experiential avoidance mediated the change in all outcomes including weight. In the context of this review a significant limitation of Lillis et al. (2009) which is otherwise a novel and progressive study was the omission of a psychometric measure of emotional eating. This omission however provides an explicit gap in the research and lays the foundation for a study that explores the effectiveness of an ACT

intervention targeting emotional eating for improvements in weight loss maintenance by targeting avoidance which is an explicit treatment target of ACT.

This review will now move onto defining ACT and its treatment targets, or underlying mechanisms of action, including avoidance known as experiential avoidance. After this the empirical literature detailing various ACT related treatment trials will be presented.

Chapter 3

Acceptance and Commitment Therapy

3.1 What is Acceptance and Commitment Therapy?

Emerging some 30 years ago, Acceptance and Commitment Therapy (ACT) is a novel therapy based on behavioural psychology principles. It is grounded in the pragmatic philosophy of functional contextualism and is extended by a comprehensive scientific account of human language and cognition labelled Relational Frame Theory (RFT) (Hayes et al., 1999; Hayes et al., 2012). A detailed account of functional contextualism and RFT are beyond the scope of this review. For the most recent, extensive review in the context of ACT see Hayes et al. (2012). It is broadly recognised within the ACT and, more broadly, the Contextual Behavioural Science (CBS) communities, that an understanding of the theoretical underpinnings of functional contextualism and RFT is desirable, however is not *necessary* for clinical practitioners to understand the minutiae of these theories to efficiently and effectively implement ACT interventions (Hayes et al., 2012). In the next few paragraphs ACT as a psychological therapy and treatment model will be described, and reviewed in relation to earlier behaviour and cognitive therapies including the similarities and differences.

ACT is widely referred to as a ‘third wave’ behaviour therapy and can be defined as an experiential approach to behaviour change that uses acceptance, mindfulness, and values based strategies (Hayes et al., 2012; Hayes, Villatte, Levin, Hildebrandt, 2011). Along with other third wave therapies such as Dialectical Behaviour Therapy (DBT; Linehan, 1993) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2001), ACT was developed as an alternative to the ‘first’ and ‘second’ wave behaviour therapies. Traditional behaviour therapy is labelled the first wave, and behaviour and cognitive therapy together, known as CBT, defined as the second wave. As is often the case when new therapies are developed, emphasising differences in comparison to existing therapies is

important to demonstrate improvement and validity. Thus the differences between the second wave therapies, specifically traditional CBT, and ACT have until recently been heavily emphasised. Instead of this emphasis on differences there is now a drive to highlight that ACT was in fact born from traditional behaviour therapies and can be seen as an extension of CBT. As far as the founders of ACT are concerned this has always been the case, with Hayes et al. (2011) explicitly labelling ACT as “one of the more broadly focussed methods in CBT” (p. 155) despite it not being based on traditional CBT assumptions. In fact Steve Hayes, one of the founders of ACT, and colleagues have proposed that the third wave therapies be re-labelled ‘Contextual Cognitive Behavioural Therapy’ to ensure that knowledge and workable interventions from traditional CBT are not abandoned within ACT but that the distinction between the two waves are explicitly stated and used mindfully (Hayes et al., 2011). The fundamental difference between the second wave therapies and ACT has been summed up as “content-versus-context” in the second and third waves respectively (Hayes et al., 2011, p. 158). It is this content-versus-context that builds on and “extends that of traditional behaviour analysis” (Hayes et al., 2012, p. 27). Before this fundamental difference is further detailed it is important to acknowledge the similarities between ACT and the behavioural therapies that came before it.

ACT founders acknowledge that ACT emerged “without an interest in tearing down previous CBT approaches so much as carrying them forward” (Hayes et al., 2011, p. 159). Hayes et al. (2012) emphasised this point, reporting in the seminal text of ACT (Hayes et al., 1999, p. 79) that it was framed as an extension of behavioural therapy, and later stated again that ACT should not be “placed outside of or opposed to CBT” (Hayes et al., 2012, p. 181). Hayes, Levin, Plum-Villardaga, Villatte and Pistorello (2013) state that any “behavioural technique, principle or functional analysis can be applied” within ACT (p. 187). Specifically methods that span both first and second wave therapies and ACT include psycho-education,

exposure, skills training/acquisition, goal setting, self-monitoring, thought recording, goal setting, and observing thoughts, feelings and behaviour (Hayes et al., 2013; Hayes et al., 2011). The fundamental difference between second wave cognitive behaviour therapy and ACT is found in the underlying assumptions about the processes or mechanisms of action. For example, in second wave therapies, exposure work is used to facilitate the extinction of unwanted feelings and thoughts in a given scenario so that the experiencing of difficult thoughts and feelings is reduced or ameliorated with symptom reduction as the explicit goal. Conversely, in ACT there is no goal to reduce or ameliorate difficult thoughts or feelings; instead exposure work provides an individual with the opportunity to *practise experiencing* their difficult thoughts and feelings as they naturally come and go without struggling to control their experience of them in the service of doing things they value, where engaging in valued action is the explicit goal (Hayes et al., 2013).

This exposure example demonstrates that second wave therapies primarily aim to teach clients how to enact control-based strategies that directly modify the form, “content, validity, intensity or frequency” of cognitions and emotions, or private psychological events, which results in changes in emotion and behaviour (Hayes et al., 2011, p. 158). In this way, second wave therapies are said to focus on form, frequency, content and “control” (Hayes et al., 2011, p. 157). In comparison, ACT focuses on “context” and function (Hayes et al., 2011, p. 157). ACT primarily aims to teach clients how to change their relationship with their thoughts and feelings, instead of trying to control and change them. They “target the context and function of psychological events such as thoughts, sensations and emotions” in order to facilitate more values-based action despite the presence of “unwanted, wanted or neutral” private psychological events such as thoughts and feelings” (Hayes et al., 2011, p. 158; Bond et al., 2011, p. 678). One of the main goals of ACT is to encourage clients to abandon the agenda to control thoughts and feelings and embrace the full continuum of human

experiences including unpleasant emotions and cognitions, and not change them, so that they can engage in valued action despite difficult private events. The emphasis on changing the function of difficult private experiences by changing the context of them as opposed to targeting a change in the form and frequency of them is the “philosophical cornerstone of ACT” (Hayes et al., 2012, p. 38). Based on this, the overarching goal of ACT is to teach people to change their relationship with their private internal experiences so as to increase their overall ‘psychological flexibility’ which enables them to engage in valued actions in the face of difficulties (Hayes et al., 2012; Hayes et al., 2013).

Psychological flexibility is important to understand because it is the ultimate aim of ACT. One technical definition of psychological flexibility is “the ability to fully contact the present moment and the thoughts and feelings it contains without needless defence, and, depending upon what the situation affords, persisting or changing in behaviour in the pursuit of goals and values” (Bond et al., 2011, p. 678). Hayes et al. (2013) more recently offered a somewhat more accessible definition of psychological flexibility as “being able to contact the moment as a conscious human being more fully as it is, not as what it says it is, and based on what the situation affords, persisting or changing in behaviour in the service of chosen values” (p. 187). Conversely, the therapeutic target of ACT is ‘psychological inflexibility’ which “entails the rigid dominance of psychological reactions, over chosen values and contingencies, in guiding action; this occurs when people fuse with evaluative and self-descriptive thoughts and attempt to avoid experiencing unwanted internal events which has the ironic effect of enhancing people’s distress, reducing their contact with the present moment, and decreasing their likelihood of taking values based actions” (Bond et al., 2011, p. 678). The definitions within the ACT framework have at times been criticised as being complex and abstract. The ACT therapist and prolific writer of ACT ‘how to’ books Dr. Russ Harris is renowned for distilling and making ACT concepts accessible to training ACT

therapists and the public and his definition of psychological flexibility is “the ability to be in the present moment with full awareness and openness to our experience and to take action guided by our values” (Harris, 2009, p. 8). Augmenting this definition, Harris also provides a simple aim of ACT: “The aim of ACT in lay terms is to create a rich full and meaningful life while accepting the pain that inevitably goes with it” (Harris, 2009, p. 7). In this definition of ACT, Harris very simply encapsulates one of the key underlying assumptions of ACT which is that the presence of difficult thoughts and feelings is normal and not pathological as our current cultural understanding of health leads most people to believe. In fact ACT explicitly rejects the widely upheld definition of psychological health as the absence of psychological pain.

At its base “ACT accepts the ubiquity of human suffering” and holds that the human experience of pain is normal and as such should be integrated and viewed as just as worthy as pleasure on the continuum of human experience and not avoided (Zettle, 2007, p. 8). What’s more is that avoidance, known as experiential avoidance within the ACT model, is what promotes the development and maintenance of human psychological suffering. ACT theory holds that it is people’s unwillingness to experience psychological pain, which manifests into *experiential avoidance* including both avoidance and control strategies, that results in psychological pain turning into suffering and maintaining psychological distress. Here it is not pain in and of itself that equates to psychological suffering, but people’s attempts to control and avoid the pain that results in suffering (Zettle, 2007; Hayes et al., 1999, 2012; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). To this end Hayes et al. (1996) view experiential avoidance as a core pathological process and see it as functionally significant in the development and maintenance of high prevalence forms of psychopathology, and there is a significant amount of empirical literature to support this understanding of human suffering (Hayes et al., 2006; Hayes et al., 1996; Levin & Hayes, 2009). As such experiential

avoidance is viewed as an unhelpful cognitive coping strategy and a core therapeutic target within the ACT model with acceptance being taught as its alternative. Within the ACT model experiential avoidance is seen as working alongside cognitive fusion, further fusion with unwanted internal dialogue unintentionally yet automatically promotes suppression and avoidance (Hayes et al., 2012). As a result cognitive fusion is also viewed as a core therapeutic target within the ACT model with cognitive defusion being taught as its alternative. In all, there are six unhelpful processes that contribute to overall psychological inflexibility within the ACT model. The goal of ACT as a psychological intervention is to target these six unhelpful processes with six inverse processes that together increase psychological flexibility (Hayes et al., 2006). These six unhelpful processes and their alternative helpful processes will be outlined in detail next.

3.2 The Six Processes of ACT and Psychological Flexibility

The six unhelpful processes and their alternative helpful processes are 1) cognitive fusion and cognitive defusion, 2) experiential avoidance and acceptance, 3) disconnection with the present moment and present moment awareness, 4) attachment to conceptualised self and self as context/noticing self, 5) disconnection to values and connection to values, 6) inaction and committed action. In outlining the ACT model it would be remiss not to include the visual representation that has become ubiquitous within ACT descriptions. The visual ACT model has been colloquially labelled the ACT Hexaflex; see Figure 1 for the constructive processes.

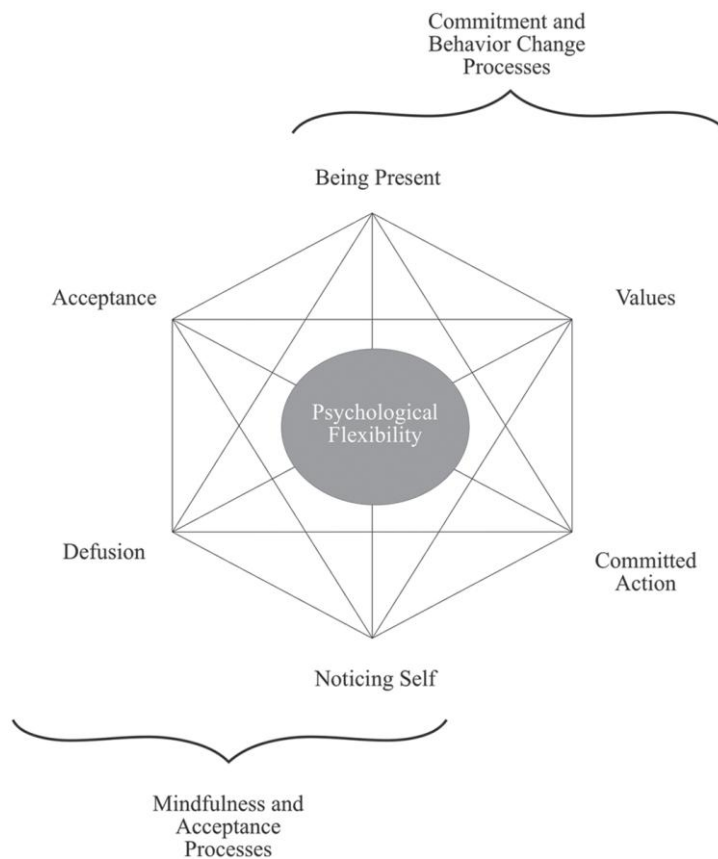


Figure 1. The ACT Model of behaviour change, from Hayes, Pistorello et al., 2012, p. 981.

3.2.1 Cognitive Fusion and its constructive alternative Cognitive Defusion. At a very basic level cognitive fusion can be described as the detrimental *overextension* of the human ability to problem solve using language or verbal knowledge. The theory underlying ACT purports that because humans are so good at solving problems in the external environment this skill has been generalised and applied to internal psychological troubles that are not actually amenable to verbal problem solving, for example trying to not think about something that is painful. Here ACT, as informed by RFT, sees language as a double-edged sword and that “human language gives rise to both human achievement and human misery” (Hayes et al., 2012, p. 16). As such, cognitive fusion is a psychological process whereby people perceive and interpret their internal thoughts/cognitions as literal truth despite thoughts being verbal constructions developed by the mind. Cognitive fusion is “argued to be

due to the pervasiveness of literal reason-giving, problem solving...[and] the excessive reliance on rules about what is possible for one's life", or in sum the hegemony of human language (Hayes et al., 2013, p. 183; Hayes et al., 2012). When people fuse with their thoughts they are unable to simply notice they are having a thought that may or may not need to be enacted, and they are unable to differentiate truth as perceived by them and truth based on objective data. The consequence of cognitive fusion is avoidance of difficult thoughts and feelings and ultimately the unintentional restriction of the person's functional behavioural repertoire aligned with personal values. In simple terms fusion means "getting caught up in our thoughts and allowing them to dominate our behaviour" or holding on to thoughts too tightly which results in restrictions in valued behaviour which underlie a meaningful fulfilling life (Harris, 2009, p. 97). Cognitive defusion is taught as an alternative to cognitive fusion. Cognitive defusion training strategies facilitate people to change their relationship with their thoughts as opposed to trying to change the content, form or frequency of them (Hayes et al., 2006). "Defusion involves learning to be consciously aware of one's thinking as it occurs" (Hayes et al., 2012, p. 23). By learning to recognise thoughts as verbal constructions people can achieve a mental distancing from the thoughts which in turn decreases their initial believability and reduces their literal quality. The constructive result of cognitive defusion is that thoughts are no longer upheld as literal truth which enables people's behavioural repertoire to expand in accordance to personally held values. Put simply, defusion means gaining some distance from thoughts, holding them more lightly and letting them come and go instead of being caught up in them (Harris, 2009). By engaging in defusion people gain a more active choice in deciding if they want to engage in hitherto automatic behaviours usually associated with their thoughts, or accept the thought as it is and choose not to act on it automatically and instead choose a values based action. Ultimately defusion teaches that although thoughts influence actions they do not control actions, it is about noticing that a

thought can be just a thought you can choose to act on, but you do not need to react (Harris, 2009).

3.2.2 Experiential Avoidance and its alternative constructive Acceptance.

Experiential avoidance is a psychological process whereby people engage in a struggle to avoid, suppress or change the form and/or frequency of their private experiences including feelings, thoughts, memories, sensation and urges, and has been shown to maintain and increase the original avoided experience. Experiential avoidance is intrinsically linked to cognitive fusion and is seen as an immediate consequence of cognitive fusion because fusing with unwanted internal dialogue unintentionally yet automatically promotes suppression (Hayes et al., 2012). Avoidance strategies are usually maintained because the immediate consequence of avoidance is that people ‘feel better’ and this short-term relief acts as a reinforcer despite the increased long term disadvantages of avoidance. Essentially, experiential avoidance is a “behavioural trap”; feel better now but feel even worse later (Hayes et al., 2012, p. 271). The constructive alternative to experiential avoidance is acceptance (Hayes et al., 2006). Acceptance is not resignation that unpleasant or unwanted states exist; it is a willingness to experience and make room for or even embrace them as part of the natural continuum of human experiences. “It is about allowing our thoughts and feelings to be as they are regardless of whether they are pleasant or unpleasant” (Harris, 2009, p. 134) With acceptance both unpleasant and pleasant states are acknowledged through conscious awareness; they are noticed but not dwelled upon and left to be experienced as they naturally come and go where no attempt to struggle against them is made, and no attempt to alter the form or frequency is made (Levin & Hayes, 2009; Lillis et al., 2009). The result of acceptance is that negative states are no longer feared as too painful to bear and the struggle to avoid them is given up. The energy previously used in the struggle then becomes available to be used for more valued ends. It is important to note that acceptance is not an end in and of

itself, rather it “is fostered as a method of increasing values-based action” (Levin & Hayes, 2009, p. 12).

3.2.3 Disconnection with the Present Moment and its constructive alternative

Present Moment Awareness. Disconnection with present moment awareness is a psychological process whereby people become lost in thoughts akin to rumination. People who are disconnected to the present moment live their lives through the lens of thoughts that are either based in the past or the future instead of the present, here and now, moment. This disconnection limits psychological flexibility because people are engaged in mind-based verbal problem-solving about things that have passed and cannot be changed, or about things that are not yet in progress. Because of this preoccupation with the past and future the present cannot be fully experienced as it occurs in the moment and life fulfilling opportunities are unintentionally missed. The constructive alternative is present moment awareness, or being present, or being mindful. Mindfulness training strategies teach people to gain awareness of the present moment, to notice the “busyness of the mind”, and to observe internal and external stimuli in a non-judgmental fashion (Hayes et al., 2012, p. 203). Within the ACT model increasing mindfulness skills facilitate increases in present moment awareness that in turn enable individuals to choose to change or persist in behaviour consistent with values and engage in the task or experience at hand in the moment. Put simply, learning to contact the present moment is learning to discriminate between noticing and thinking which enables actions to be chosen freely and based on personal values (Harris, 2009). Like acceptance, mindfulness is not an end in and of itself but is defined as a meta-skill that enhances psychological flexibility (Hayes et al., 2006; Zettle, 2007).

3.2.4 Attachment to Conceptualised Self and its constructive alternative Self as

Context. Attachment to conceptualised self is a psychological process whereby people define themselves according to their thoughts, feelings and sensations using ‘I’ statements that lead

to a sense of self as a locus of perspective. Self as a locus of perspective is seen as limiting because the self is preserved to be ‘right’ and is thus defended unconditionally even if it is “loathsome”, which limits psychological flexibility (Hayes et al., 2012, p. 222). Self as context is taught as an alternative to defending the conceptualised self. This means that people learn that they are not their thoughts, feelings and sensations, that these are constantly changing and that these stimuli are not harmful when observed non-judgementally. The result of self as context is that people learn to gain awareness of their natural flow of experience without becoming attached or defensive, which fosters psychological flexibility (Hayes et al., 2006; Levin & Hayes, 2009). Put simply, self as context can be thought of as “noticing that we are noticing” (Harris, 2009, p. 173). Through ‘non-judgemental noticing’, experiences can be observed without becoming entangled in them or fearful of them. It is a space that creates a vantage point from which we can look at thoughts and feelings instead of looking from the vantage point of the thoughts and feelings themselves. Self as context creates a space that stays the same regardless of content. It is noteworthy that this concept has been referred to in many different ways including, for example, “self-as-perspective, the observing self, the noticing self, the silent self, pure consciousness, pure awareness, the transcendent self” (Harris, 2009, p. 173).

3.2.5 Disconnection to values and its constructive alternative Connection to Values. When people are disconnected from their values it results in them living life in a way that is somewhat empty of explicitly chosen qualities and thus may not be their preferred way of living if they were given a choice. Disconnection to values does not facilitate the opportunity for people to live personally meaningful and purposeful lives. Within ACT, connecting to values means consciously identifying aspects of life that are important to the individual that can then become a foundation upon which life can be lived. Values are purposely chosen qualities that act as guiding principles about how we want to live life, how

we want to behave and what we want to stand for (Harris, 2009). More technically, “in ACT, values are freely chosen, verbally constructed consequences of ongoing, dynamic, evolving patterns of activity, which establish predominant reinforcers for that activity that are intrinsic in engagement in the valued behavioural pattern itself” (Hayes et al., 2012., p. 298). Living according to one’s values provides a framework which guides the development of specific goals. However living by one’s values in and of itself cannot be attained; it is an ongoing process. The result of living by one’s values is that behaviours, activities and goals are congruent and thus motivation becomes intrinsic, which enhances the ability to act in personally effective ways and thus live a personally meaningful life (Hayes et al., 2006). A common phrase that elicits values is “What do you want your life to stand for” (Hayes et al., 2012, p. 304).

3.2.6 Inaction and its constructive alternative Committed Action. Inaction is a process by which people engage in behaviours, activities and goals that are not explicitly and purposely chosen and not congruent with behaviours that might occur if values were explicitly chosen. In that sense, “commitment is properly part of the expression of personal values” (Hayes et al., 2012, p. 328). Committed action means reassessing life goals in accordance with chosen values, and further, making a commitment to one’s self to behave, act and set goals that are in accordance with these values. “Unlike values, which are constantly instantiated but never achieved as an object, concrete goals that are values consistent can be achieved” (Hayes et al., 2006, p.9). Within the ACT model committing, taking action, and behaving in accordance with ones values result in a more personally purposeful and meaningful life (Hayes et al., 2006; Levin & Hayes, 2009). Furthermore, “in ACT, committed action is a values-based action that occurs at a particular moment in time and that is deliberately linked to creating a pattern of action that serves the value” (Hayes, et al., 2012, p. 328). Committed action also means establishing a habit of “repeatedly returning

to our values, no matter how many times we lose touch with them” (Harris, 2009, p. 189).

Ultimately, committed action is “a choice to behave in a particular way on purpose” (Hayes et al., 2012, p. 330).

3.2.7 The six constructive processes together. Each of the six constructive processes subsumed within the ACT model are seen as overlapping and interrelated and psychological flexibility is risked if one aspect is missing. (Hayes et al., 2012; Hayes et al., 2006). At the same time, however, each process is targeted for change only in the service of helping people connect to their values and enact them in values based actions which engenders a life more personally meaningful. The constructive processes are not learnt as an end unto themselves. They are learnt insofar as the deconstructive processes are “blocking the client from pursuing a committed direction in life” (Hayes, et al., 2012, p. 160). To that end “all therapeutic interactions are evaluated as they relate to the client’s chosen values and goals, and the issue is always workability— that is, whether they work in practice”. Simply, are the constructive alternative processes we are targeting for change ‘working’ to help you engage in your valued based goals? (Hayes et al., 2012). Despite the interconnectedness of the six processes within the ACT model as presented here, historically the two processes of cognitive fusion and experiential avoidance have been elevated within the theoretical and research literature and upheld as the two core processes responsible for the development and maintenance of psychological pain. The potency of cognitive fusion and experiential avoidance within the ACT model will be detailed next.

3.3 Experiential Avoidance and Cognitive Fusion as the Two Core Processes

Responsible for the Development and Maintenance of Psychological Pain

Hayes and Smith (2005) state “put simply, the root cause of experiential avoidance is cognitive fusion” (p. 58). In their lengthy paper that elucidates their argument that many “forms of psychopathology are usefully viewed as unhealthy methods of experiential

avoidance” Hayes et al. (1996) state that it is “fusion with thoughts that particularly supports the adoption of experiential avoidance strategies” (p. 1159). In addition, Hayes et al. (1999) in their original seminal work explaining ACT, state that experiential avoidance and cognitive fusion together underpin their theory of the development and maintenance of psychopathology, and that experiential avoidance and cognitive fusion are the “two phenomena [that] then become the key targets of our therapeutic work” (p. 2). Despite the recent move to subsume experiential avoidance and cognitive fusion under the umbrella of psychological inflexibility the emphasis on the importance of these two concepts within the ACT model is still often emphasised. For example, “ACT speculates that there are two core psychological process – cognitive fusion and experiential avoidance – that are responsible for most psychological suffering” (Harris, 2009, p. 17), and recently Hayes et al. (2011) stated “together experiential avoidance and cognitive fusion reduce flexible contact with the present moment and forestall individuals from contacting what they value” (p. 155). Most recently in the updated seminal text Hayes et al. (2012, p.25) state that “at a more profound level, the ultimate goals of ACT are to undermine the hegemony of human language” (Hayes, et al., 2012, p.25). This means that within the ACT model cognitive fusion exemplifies the hegemony of human language, it fuels experiential avoidance, and together these processes contribute to the four more unhelpful and destructive psychological processes which are disconnection with the present moment, attachment to conceptualised self, disconnection to values, and inaction (Hayes et al., 2012; Levin & Hayes, 2009). As these examples show there is still emphasis placed on experiential avoidance and cognitive fusion over and above the other processes despite the current efforts to promote ACT as a unified model of psychological flexibility. This means that at present there are some inconsistencies found within the literature especially with regards to using the terms experiential avoidance and psychological inflexibility interchangeably. This is particularly the case for the original

psychometrically validated ACT measure which is now referred to interchangeably as a measure of experiential avoidance and/or a measure of psychological inflexibility—The Acceptance and Action Questionnaire or the AAQ, now in a revised version AAQII (Bond et al., 2011).

3.4 ACT Psychometric Measures

The Acceptance and Action Questionnaire (AAQ) is the original and most widely used psychometrically validated and reliable measure found within the ACT empirical literature and originally was referred to as a measure of experiential avoidance. The recent revision of the measure describes the AAQII as a one-factor measure of psychological inflexibility, or experiential avoidance (Bond et al., 2011). Presently there is no consensus about restricting the description of the AAQ to one or the other which means there is a level of inconsistency within the literature when the AAQ is described. This problem may or may not become larger with the recent emergence of new measures developed for the specific ACT processes, for example a new Cognitive Fusion Questionnaire (Gillanders et al., 2014), that will allow more component analyses of each of the six processes to elucidate specific mechanisms of action within the ACT model. To date exploration of each of the six processes has been limited by the unavailability of measures. Notwithstanding its dual description the AAQ has repeatedly been found to do a “very good job of predicting many forms of psychopathology” (Hayes et al., 2013, p. 190; Hayes et al., 2006) and it has been found to be a significant mechanism of action mediating changes in outcome measures. This is important because distilling mechanisms of action is a core aim of the ACT research agenda.

3.4.1 ACT and measuring mechanisms of action. One of nine recently articulated aims of the ACT research community is to measure mechanisms of action within the ACT model and “emphasize mediation and moderation in the analysis of applied impact” (Hayes et al., 2012, p. 368). For all nine aims please see Hayes et al. (2012, p. 368). Mediation analysis

is important because it enables the identification of the mechanisms of action involved in an intervention that acts to produce changes found in outcome measure. Moderation analysis is important also because it enables the identification of circumstances in which mechanisms of change are likely to be helpful and when they are unlikely to be helpful. There has been a sustained commitment by ACT researchers to explore mechanisms of action through formal mediation analyses, and as a result there is broad support for the mediational quality of experiential avoidance as demonstrated in a number of studies investigating a range of health related problems and quality of life from an ACT framework (Hayes et al., 2006; Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009; Pull, 2008). As highlighted earlier, the importance of identifying mediators was also identified by Byrne (2002) within the weight loss maintenance literature which shows that to date psychological mechanisms of action in weight loss maintenance have yet to be clearly identified. The focus on the importance of mediation analysis within ACT means that the research conducted by Lillis et al. (2009) reaches another level of influence in the literature because they found that weight related experiential avoidance served as a mediator of the effect of their 1-day ACT treatment intervention for weight and weight related health variables.

Given the AAQ is the most widely used measure of experiential avoidance and psychological inflexibility it is also the most widely employed ACT measure within mediational analyses and has been shown to account for underlying mechanisms of action. Over time however more specific and targeted versions of the AAQ have emerged and are proving to be more helpful than the general AAQ when exploring specific problem areas like diabetes, Acceptance and Action Diabetes Questionnaire (AADQ: Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007) and weight the AAQW (Lillis & Hayes, 2008). Psychometrically valid and reliable measures are also emerging for the other ACT processes including cognitive fusion which to date has rarely been measured as a unique component within the

ACT intervention trials. The emergence of measures for each ACT process will enable more analysis of mechanisms of action within the ACT model which can lead to refinement of both the model as well as the refinement of treatment interventions for specific problems like emotional eating and weight loss maintenance. While explicitly interested in understanding the contribution that each of the six process components provide to the ACT model the current global emphasis of the ACT research community is promoting ACT as a unified model of human functioning, and further a transdiagnostic treatment intervention.

3.5 ACT as a Transdiagnostic Intervention

At the root level the ACT treatment model holds that all psychological suffering stems from the hegemony of human language and the process of cognitive fusion which is intrinsically linked to and fuels experiential avoidance. Here all suffering stems from the same cause and thus ACT is promoted, as already mentioned, to be a “unified model of human functioning and adaptability” (Hayes et al., 2012, p. 60). Congruently, ACT is promoted as a transdiagnostic therapeutic treatment intervention, because all suffering stems from the same cause. Consequently, ACT interventions are purported to not be bound by disorder specific diagnosis and treatments and instead transcend these limitations to enable application to a wide range of problems. A recent review demonstrates the success of ACT from a transdiagnostic sense detailing that good quality studies show that ACT has been efficacious for a range of problems including “chronic pain, obsessive-compulsive disorder, and a subset of other anxiety disorders (panic disorder, social phobia, and generalised anxiety disorder” (Smout et al., 2012, p. 97). Hayes et al. (2012) also provide a comprehensive list of controlled ACT studies that also demonstrate the applicability of ACT across a whole range of problems areas (p. 98).

3.6 The ACT Model Section Summary

This section of the review has provided a comprehensive explanation of ACT, detailing in particular its underlying mechanisms of action that form treatment targets. Overall, ACT as a psychological treatment teaches people “to obtain psychological distance (i.e., defuse) from distressing internal experiences; clarify overarching personal values; create goals that can help patients live a more fulfilling, meaningful life; and increase willingness to experience negative internal experiences in the service of valued behaviour” (Juarascio et al., 2013, p. 461). The next section will go on to review the literature as it pertains to ACT and weight empirical studies.

3.7 Acceptance and Commitment Therapy and Weight Related Research

In 2009, at the time the initial literature search for this thesis was conducted, there were four published studies that provided direct support for the implementation of an ACT treatment intervention targeting emotional eating in the context of weight loss maintenance. The most relevant was Lillis et al. (2009) as detailed, followed by Tapper et al. (2009) followed by Forman & Hoffman et al. (2007) and Forman et al. (2009). Since 2009 there have been a number of additional publications that support the exploration of the ACT model within the arena of weight, and some have also directly measured emotional eating. The next part of the review will provide a detailed description of the later three original studies that together with Lillis et al. (2009) provided the impetus for this research. Following that will be descriptions of the more recent publications that provide direct support for matching ACT, emotional eating and weight loss maintenance, as well as publications that provide complimentary validity to exploring these factors together.

Tapper et al. (2009) conducted an exploratory RCT to test the effectiveness of a brief ACT based group treatment intervention for weight loss. Tapper et al. (2009) cited the association between obesity and emotional eating and conceptualised emotional eating as a

form of experiential avoidance. They hypothesised that an ACT based intervention would be effective in reducing emotional eating because ACT directly targets experiential avoidance. Although they explored weight loss as opposed to weight loss maintenance the study's details are important given the limited literature exploring this currently niche area. Participants ($N = 62$) were recruited from the general population who identified as currently trying to lose weight. They were randomised to the control condition which was to continue their current weight loss effort unchanged ($n = 31$) or to the intervention condition which involved four 2-hour workshops that constituted an ACT treatment intervention for weight loss ($n = 31$). Similarly to Lillis et al. (2009), the ACT intervention purposely and explicitly did not involve any focus on traditional behavioural weight control strategies and no dietary advice was given. The intervention comprised the following ACT components: values, cognitive defusion, undermining the control agenda, acceptance and willingness, self-awareness and mindfulness and committed action. The intervention was based on Hayes et al. (1999) and Hayes and Smith (2005). The measures included were BMI, physical activity as measured by the Brief Physical Assessment Tool (Smith, Marshall, & Huang, 2005), mental health as measured by the General Health Questionnaire-12 (GHQ12: Goldberg & Williams, 1988), emotional eating and external eating as measured by the Dutch Eating Behaviour Questionnaire (van Strien et al., 1986) and the Emotional Eating Questionnaire (EEQ: Masheb & Grilo, 2006), binge eating by the Binge Eating Scale (BES: Gormally, Black, Datson, & Rardin, 1982), and experiential avoidance as measured by the AAQII (Bond et al., 2011). All measures were assessed at baseline, 4-month and 6-month follow-up. Statistically significant results were limited although there were trends suggesting better outcomes for those who had received the ACT intervention. Post-hoc exploratory data analysis excluded participants who did not attend any allocated workshops and those who received the ACT intervention but never implemented the ACT strategies ($n = 7$) leaving a total of 16

intervention participants and 24 control participants. The results showed that the intervention group reported significantly greater reductions in BMI and significant increases in physical activity. Here, people who applied ACT principles at 6-month follow-up lost 2.32kgs (5 pounds) and participated in 3.11 more sessions of physical activity per week than control participants. A series of hierarchical multiple regression analyses suggested that the intervention was most likely effective through changing binge eating and physical activity scores. A significant part of this paper's discussion focuses on the likelihood that the cognitive defusion component of the ACT intervention probably brought about the significant results because of the limited significant results elicited for experiential avoidance as measured by the AAQII. The assertion that cognitive fusion probably brought about the change is empirically baseless because there is simply no measure of cognitive fusion in the study. This is a limitation of the study design and of the overall discussion. Other limitations include the significant attrition; for example only 48% of the intervention group attended all 4 sessions, with the final sample being $N = 30$ from an original $N = 62$. Only women were recruited for this study and their mean age was 41 years. Nonetheless, the results of the study are important for a number of reasons. Firstly as the authors highlight this is the first study to "adapt mindfulness-based techniques for a programme designed exclusively for weight loss" (p. 402). It is also important because it is the first to use an ACT based treatment intervention protocol and include a valid and reliable measure of emotional eating in the Dutch Eating Behaviour Questionnaire (van Strien et al., 1986). The study also showed that a brief ACT intervention, of 8 hours, was able to bring about change in desired directions. Despite the limited findings pertaining to the significance of emotional eating in this study the bivariate change scores of BMI and emotional eating were significant ($0.35, p < .05$), which suggests that within an ACT based intervention study with more power changes in emotional eating

may be found to be significant for weight outcomes and “reinforces the potential importance of addressing this type of eating behaviour” (p. 403).

In comparison to the previous two studies of Lillis et al. (2009) and Tapper et al. (2009) who used only acceptance based components in their interventions, Forman et al. (2009) married acceptance based therapy components based on ACT to one of the most renowned and widely used weight loss manuals based on cognitive behavioural therapy for weight loss called LEARN: Lifestyle, Exercise, Attitudes, Relationships and Nutrition (Brownell, 2004). Forman et al. (2009) hypothesised that behavioural weight loss strategies would be improved by the addition of acceptance based strategies, and thus conducted a single group design pilot study to test the preliminary feasibility of an “acceptance-based behavioural treatment for obesity” (p. 223). The authors purport that this was “the first time an acceptance based innovation of standard behaviour treatment for obesity was attempted” (p. 231). Participants, $N = 29$ of which $N = 19$ completed, were overweight and obese women who attended a 12-week, 1 hour per session, behavioural treatment for weight loss that was modified to substitute traditional cognitive strategies, such as cognitive restructuring, with acceptance based therapy components. The measures used to explore the effectiveness of the intervention included BMI, mindful awareness, quality of life, disinhibition and cognitive restraint as measured by the Three Factor Eating Questionnaire (Stunkard & Messick, 1985), emotional eating as measured by the Dutch Eating Behaviours Questionnaire (van Strien et al., 1986) and food related experiential avoidance as measured by the Food Acceptance and Awareness Questionnaire designed for this study. Base-line, post-treatment and 6-month follow-up measures were taken. The results showed significant improvements on all outcome variables in the desired directions at post-intervention, and these results were maintained at the 6-month follow-up. Specifically, results showed that post-treatment weight loss was reported to be comparative to traditional behavioural weight loss treatments of similar length,

with a mean weight loss of 6.6% or 6.2kg. More importantly however the results showed that initial weight loss was maintained, “six months after the end of the intervention, participants had not only maintained their weight loss but had continued to lose weight, achieving a mean weight loss of 9.6% (8.5kg)” (p. 232). The results also showed a significant reduction in emotional eating with scores decreasing from 30.56 to 25.25, $p < 0.01$. Similarly, there was a significant reduction in disinhibition scores from 7.89 to 4.83, $p < .01$, and increases in food related acceptance increasing from 39.66 to 51.90, $p = .04$. There were no formal mediation analyses included however, Forman et al. (2009) state that the results suggest that acceptance based skills as measured by food related experiential avoidance was associated with weight loss at post-intervention and at 6-month follow-up suggesting that the underlying mechanism of action was experiential avoidance. It is noteworthy that the results of this study were used to help validate the Food Acceptance and Awareness Questionnaire (FAAQ), which was found to be psychometrically sound (Juarascio, Forman, Timko, Butryn, & Goodwin, 2011). Forman et al. (2009) concluded by stating that behavioural weight loss programs that facilitate initial weight loss may improve long term outcomes by incorporating acceptance based strategies. Given that this is the first study to report a combined behaviour and acceptance based approach to weight loss the result represents a significant advancement in the literature linking the areas of weight, weight related outcomes, and ACT. At the same time limitations of the study need to be acknowledged. Most importantly this is a single sample group design so there is no control group to compare with, in addition the sample size ($n = 19$) was small and attrition ($n = 10$) was high. A relative strength of the study in comparison to other studies purporting to measure emotional eating is that they actually used a valid and reliable measure of emotional eating in the Dutch Eating Behaviour Questionnaire, although an untested modified version was also included (van Strien et al., 1986). One point not discussed however is the construct overlap inherent in measures of

disinhibition and emotional eating used in this study, because disinhibition measures both emotional eating items as well as dichotomous thinking items (Niemeier et al., 2007). Again, as in earlier studies discussed in the general weight loss maintenance literature, the authors have overlooked this overlap which means that multicollinearity may be inhibiting the ability of the analyses to accurately reflect the unique variance that emotional eating may account for in weight related outcomes. Despite the limitations however this study's intervention is novel as well as theoretically sound combining well-known evidenced behavioural strategies together with acceptance strategies shown to be effective in other health related areas. As such this study provides confirmative evidence that weight loss outcomes may be improved through developing acceptance based strategies based on ACT. It also adds support for the development of a study using an ACT based treatment intervention targeting experiential avoidance to improve emotional eating for improvements in weight loss maintenance.

The fourth study available in 2009 was the study by Forman & Hoffman et al. (2007) which constituted an analogy study to compare different strategies for coping with food cravings. Forman & Hoffman et al. (2007) defined food cravings "as an intensely strong desire for a specific food or type of food" (p. 2373) and cited literature associating food cravings with increased calorie intake, aversive mood states and obesity status, and stated that one of the current challenges of obesity treatment was to elucidate the coping strategies that will improve people's ability to manage food cravings and therefore reduce emotion-related food consumption. Forman & Hoffman et al. (2007) chose to compare control based coping strategies grounded in cognitive behavioural therapy, including distraction and cognitive restructuring, to acceptance based strategies grounded in ACT, including acceptance and defusion. Forman & Hoffman et al. (2007) note that within traditional weight loss treatments reductions in the frequency and intensity of food urges and cravings are targeted by teaching people distraction and cognitive restructuring techniques, and suggest that these techniques

may have paradoxical effects and increase cravings and eating. Conversely, an acceptance approach where people learn to tune into previously avoided or suppressed food urges and cravings may have the counter-paradoxical effect and reduce cravings and eating. Analogous effects within other health domains such as smoking were cited as comportsing evidence to support their study rationale. Participants ($N = 98$) were randomised to one of three conditions 1) the acceptance based strategies grounded in ACT including acceptance and defusion as found in Hayes et al. (1999) ($n = 30$), 2) control based strategies grounded in cognitive behavioural therapy including distraction and cognitive restructuring as found in the renowned cognitive behavioural weight loss package LEARN ($n = 36$) (Brownell, 2004), 3) no intervention, were told to simply resist eating chocolate ($n = 32$). The main outcome measures were chocolate consumption, the influence of the food environment as measured by the Power of Food Scale (PFS: Lowe et al., 2009), and cravings as measured by the Food Craving Scale – state version (FCQ: Cepeda-Benito, Gleaves, Williams, & Erath, 2000). The procedure involved a 30-minute instruction on how chocolate cravings should be responded to according to group allocation and then all participants received a transparent box containing chocolate and were instructed not eat any chocolate for 48 hours while keeping the chocolate with them. The main conclusion was that “for those with greater susceptibility to food, distraction-based strategies ‘backfire’ and acceptance based strategies offer superior efficacy” (p. 2384). This finding was extracted from the examination of the Power of Food Scale (influence of food) score when it was trichotomised into low, medium and high, and then examined in relation to the proportion of the sample that consumed chocolate by intervention group and PFS level. Those participants who fell within the highest band of PFS and were in the acceptance based coping strategy group consumed the lowest amount of chocolate with 0% of people eating any chocolate. Conversely, in the highest band of PFS the no intervention group and control based coping strategy group people consumed chocolate,

30.0% and 9.09% respectively. These results were not, however, statistically significant but rather indicated a trend toward significance, and thus caution in over interpretation is warranted. The results also showed a non-significant trend that where PFS was low, the no intervention and the acceptance based coping result was identical (8.33% in chocolate consumption) while the control based strategies group performed best with 0%. Together these results suggest that where people have low levels of susceptibility to food traditional cognitive behavioural strategies are adequate coping strategies; however where people have high levels of susceptibility to food, acceptance based strategies are most helpful, and Forman & Hoffman et al. (2007) conclude that a “potential implication of this result is that those who are likely to be highly susceptible to food, such as overweight and obese individuals, might particularly benefit from acceptance-based interventions” (p. 2384). There are a number of limitations that restrict the generalisability of the results and include the use of an undergraduate student sample with a BMI within the normal range. This sample population is not representative of the overweight and obese populations in which the research has theoretical implications for due to the association of overweight and obesity to food overconsumption. Also the mean age was 19.6 yrs, so comparisons with other weight related research is limited because it usually comprises middle-aged women. Despite the limitations the general design of the study is robust and it provides early insights in to the possibility that acceptance based interventions may be particularly helpful for people who have most difficulty with food cravings which are associated with overweight and obesity. A further strength of the study is its design which lends itself to replication, and has recently been replicated and extended by Forman, Hoffman, Juarascio, Butryn, & Herbert (2013).

Forman et al. (2013) essentially used the same procedure to study food intake with the addition of some measures and introducing a bogus taste test to measure the rebound effect. The rebound effect assesses whether people increase their food intake after an externally

imposed restriction period ends, analogous to diet restrictions. Other additional measures were an ecological momentary assessment at four predetermined points per day, and the inclusion of an emotional eating measure as measured by the revised Three Factor Eating Questionnaire R-18 (Stunkard & Messick, 1985; Karlsson et al., 2000). The coping strategy instructions were increased to 2 hours and the intervention was increased from 48 hours to 72 hours where participants were instructed to try their best in not eating sweet foods including those in the transparent box provided or other. The acceptance based strategy was based on the acceptance based treatment used in Forman et al. (2009), which itself drew heavily from the seminal ACT text Hayes et al. (1999). The cognitive control based strategy again used LEARN with the addition of “the Diabetes Prevention Program (The Diabetes Prevention Program Research Group, 1999) and the Beck Diet Solution (Beck, 2007). Importantly, and as opposed to Forman & Hoffman et al. (2007), participants ($N = 48$) fulfilled the criteria of overweight or obese. Again, similarly to Forman & Hoffman et al. (2007) the results of this study need to be reviewed with caution because trends, instead of statistically significant results, have been reported. Overall the results suggest that the acceptance based strategies were better than the control based strategies in reducing consumption of sweets and cravings. The results also mirrored Forman & Hoffman et al. (2007) insofar as acceptance based strategies were most helpful for people experiencing high levels of emotional eating and responsiveness to the food environment. The results also showed a trend that suggested that acceptance based strategies may be helpful in attenuating the “rebound” eating effect, and that this finding is important because rebound eating is thought to contribute to unsuccessful weight loss maintenance in overweight and obese women. The greatest limitation of the study is its small sample, limiting its power to elicit any statistically significant results, as well as the lack of a control group. Despite the limitations, the Forman et al. (2013) extension of

Forman & Hoffman et al. (2007) does provide recent results that add to the cumulative evidence that act to support the exploration of emotional eating within the ACT model.

In addition to the original studies there are two additional treatment intervention studies published since 2009 that measure emotional eating and weight or food related experiential avoidance. These two publications are detailed next. After that a brief review of two studies exploring food craving, food intake and the effectiveness of cognitive defusion are briefly reviewed. Following that three studies from the health related literature that comport with the research exploring ACT in the context of emotional eating and weight loss maintenance are presented.

In a similar vein to the current literature review, Niemeier et al. (2012) found that the cumulative evidence suggests that emotional eating is a contributing factor to both successful weight loss and successful weight loss maintenance. Drawing heavily from the NWCR evidence Niemeier et al. (2012) predominantly used the term internal disinhibition, instead of emotional eating, defined as “a tendency to eat in response to thoughts and feelings” (p. 428). Similarly rather than the term ‘emotional eaters’, they use the term ‘emotional overeater’. Definitions aside, the main idea underlying their research is the same as this review, and they concluded that emotional overeaters might experience better outcomes if taught ACT based acceptance psychological skills. As such, Niemeier et al. (2012) conducted a pilot study using a single group design to explore the effectiveness of an integrated standard behavioural weight loss approach overlaid with an acceptance based behavioural weight loss approach. The intervention was delivered in a group format with one session weekly for 24 weeks. A brief summary of the intervention content reveals that the protocol is ACT consistent and explicitly included content pertaining to values, acceptance, cognitive defusion and committed action, and “specifically targeted experiential avoidance as related to eating and weight” (p. 434). People who reported difficulties with eating in response to emotional and

cognitive cues were specifically targeted for participation as they were most likely to benefit from an approach targeting experiential avoidance related to emotional eating or internal disinhibition. Inclusion criteria included attaining a score of 5 or greater on the internal disinhibition subscale of the Three Factor Eating Questionnaire (Stunkard & Messick, 1985; Niemeier et al., 2007), a score that is representative of more difficulty in losing weight and of more eating in response to emotional and cognitive cues. The other measures included were BMI and the AAQW (Lillis & Hayes, 2008). Measures were administered at baseline, immediately post-treatment and at 3 month follow-up. Participants ($N = 21$) were adults recruited from the general population who were overweight or obese and who identified with having trouble controlling their eating when stressed. Eighteen people completed the study.

The results showed that the acceptance based behavioural intervention was associated with significant weight loss and decreases in BMI at the 3 month follow-up, with participants losing an average of 12.1kg compared to 8kg in standard behavioural treatments. Most relevantly for this review, there was no significant weight regain at the 3-month follow-up. Participants also showed significant improvements in the areas of internal disinhibition and experiential avoidance with these improvements maintained at the 3-month follow-up. Participants reported high levels of satisfaction with the intervention and reported that it helped them modify the way they cope with emotions and thoughts, and increased their awareness of eating behaviours. The results also revealed a significant relationship found between weight loss and decreases in weight related experiential avoidance at post-treatment ($r = 0.64, p = .002$) and 3-month follow-up ($r = .62, p = .003$). The authors state that this latter result suggests a potential mechanism of action with weight related experiential avoidance or psychological inflexibility underlying the treatment effect resulting in weight loss and maintenance. This assertion, however is only made in the abstract of the paper and although a specific aim of the paper was to explore underlying mechanisms of action, no

formal mediation or moderation data analysis techniques were employed and no mention of mechanisms of action are mentioned in the discussion. The assertion is based only on simple correlation analyses and so limits the interpretability of the finding. Other limitations of the study include the small sample size and the single study design; the generalisability of the findings are also limited to the composition of the sample, again being predominantly female, Caucasian and middle-aged. Another limitation for this study that is specific to the construct of emotional eating is the measure of internal disinhibition used. As highlighted earlier, now on multiple occasions, this measure includes emotional eating and items that describe dichotomous thinking (Niemeier et al., 2007, p. 2490). Given that the internal disinhibition scale contains related yet distinct constructs this measure is likely obscuring the unique variance that emotional eating may account for. The scale nonetheless reflects the construct about emotional eating and thus this study is important because it adds to the cumulative knowledge of emotional eating in the context of ACT interventions. The authors conclude that their study provides support for further exploration of novel psychological treatments using acceptance based approaches to target eating in response to emotional and cognitive triggers and suggest that the benefit in this approach lies in increasing adaptive coping skills. Further, they state that obesity treatment may be substantially improved by including an acceptance based approach. Overall this study is important because it is the first study published to explicitly target emotional eating, or eating in response to emotional and cognitive triggers, using an ACT based intervention coupled with traditional behavioural strategies with results showing improvements in weight related experiential avoidance and weight outcomes.

The second main intervention study published since 2009 was based on the reasoning that weight loss maintenance relies on people's ability to maintain their engagement in the recommended dietary and exercise changes known to facilitate weight loss and weight loss

maintenance (Forman & Butryn et al., 2012). Congruent with the current literature review Forman & Butryn et al. (2012) reasoned that an “acceptance-based behavioral program has the potential to provide individuals with the psychological tools necessary to achieve dietary and physical activity goals within an obesogenic environment” (p. 1). To test their hypothesis, Forman & Butryn et al. (2012) conducted a RCT comparing an acceptance based behavioural treatment (ABT) against the current leading standard behavioural treatment (SBT) LEARN, augmented by The Diabetes Prevention Program Research Group (DPPRG, 1999). The treatment intervention constituted 30 x 1.25 hour group based workshops held weekly for the first 20 weeks and then bi-weekly from the 21-40 weeks. There were some shared components between each treatment, for example the psycho education provided about recommended dietary intake and incremental increases in physical activity was identical. Other shared components were teachings about identifying triggers for overeating and barriers to physical exercise. Components that were unique to the SBT were cognitive restructuring and distraction techniques. Components that were unique to the ABT intervention were experiential acceptance and defusion, with this treatment based on ACT techniques drawn from Hayes et al. (1999). Participant inclusion criteria included being within or over the overweight range of BMI. Participants ($n = 128$) were randomly assigned via blocking design by baseline BMI to either group, ABT ($n = 74$ with $n = 50$ completing the follow-up assessment) or SBT ($n = 54$ with $n = 37$ completing the follow-up assessment). Measures included researcher measured BMI, quality of life, depression, food responsiveness, emotional eating as measured by the Emotional Eating Scale (EES: Arnow, Kenardy, & Argas, 1995), disinhibition as measured by the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) and food acceptance as measured by the Food Acceptance and Action Questionnaire (Juarascio et al., 2011). Also measured was interventionist expertise, novice vs expert (Novice, means years of clinical experience was

2.67 yrs; Expert, means years clinical experience was 7yrs). Measures were assessed at baseline, 10 weeks, 20 weeks, 40 weeks and follow-up at 6 months. Overall the results showed that when delivered by an expert, ABT was superior to SBT for weight loss and maintenance at 6 months. The results also suggested that ABT is of particular benefit for those experiencing high levels of emotional eating and that people with higher levels of depression, disinhibition and food responsiveness also responded significantly better to the ABT intervention.

Specifically, when delivered by experts, the ABT ($n = 28$) participants lost significantly more weight than SBT ($n = 29$) at post intervention (13.17 % vs 7.54% respectively) $F(155) = 6.01, p = .01$. At the 6 month follow-up results again showed that ABT was significantly better, with ABT resulting in a weight loss of 10.98% compared to SBT 4.83%, with ABT participants experiencing “2.5 times the weight loss of SBT” (p. 6). Further, 64% of participants who received the ABT intervention maintained at least 10% of their weight loss, which is clinically significant, compared to 46% in the SBT group. In order to facilitate understanding of the impact of group membership for individuals experiencing internal disinhibition, moderation analyses were conducted using a mean split (high /low) of participants on the variables of depression, emotional eating, disinhibition and food responsiveness. Participants scoring high on these variables fared significantly better in percentage weight loss if they had received the ABT intervention compared to those who received the SBT intervention. The percentage of weight lost for those scoring high on depression in the ABT group was 11.18% compared to 4.63% in the SBT group, $p < .05$. The percentage of weight lost for those scoring high on emotional eating in the ABT group was 10.51% compared to 6.00% in the SBT group, $p < .05$. The percentage of weight lost for those scoring high on disinhibition in the ABT group was 8.29% compared to 6.35% in the SBT group, $p < .05$. The percentage of weight lost for those scoring high on food responsiveness in

the ABT group was 9.70% compared to 4.46% in the SBT group, $p < .05$. Mediation analysis did not reveal any significant results; however results of moderated mediation did. It was found “that psychological acceptance of food-related internal experiences was a mediator only amongst those high in emotional eating as measured by the Emotional Eating Scale (EES)” (p. 6) (i.e., moderated mediation was observed; 40 week: low EES = -1.83, CI: -5.28 to 0.08, high EES = 2.16, CI: 0.05 to -6.18; 6 month: low EES = -1.56, CI: -4.98 to 0.06, high EES = 1.85, CI: 0.01 to -6.02). This means that psychological acceptance was found to be a mechanism of action in changes in emotional eating for those scoring high on emotional eating. The study’s design and data analyses are robust and are mainly limited by the small sample size in each group once each group is further split into interventionist level of expertise. As with other studies in this area generalisability of the findings are limited to middle-aged ($m = 47$) and Caucasian women (62%). Similar to other studies again, there seems to be no recognition that some of the scales used may measure related yet distinct psychological constructs. In this study a measure of emotional eating and a measure of internal disinhibition were used. This can be seen as a good thing, as emotional eating has its own unique measure which is uncommon. However, it is also possible that multicollinearity may be impacting the analyses’ strength in finding the unique variance that can be attributed to emotional eating as the internal disinhibition scale measures both emotional eating and dichotomous thinking. This means that there is measurement and conceptual overlap between the emotional eating measure and the internal disinhibition measure, which could mean that the findings for emotional eating may be stronger than the results indicate. A strength of the study is the employment of moderation and mediation data analyses, as well as the inclusion of active comparison groups, and that it is the “first randomized controlled trial of a full-scale acceptance based behavioural treatment (ABT) for obesity” (p. 2). Overall the results of this study are important because they show that ABT is particularly helpful for people scoring

high on emotional eating and that food related acceptance or, conversely, food related experiential avoidance may be a mechanism of action in emotional eating. The authors concluded that people who are “prone to eating in response to internal and external cues may display greater benefits when taught acceptance-based strategies” (p. 7) and that the results of this study provide support for the inclusion of acceptance-based skills into behavioural weight loss interventions.

These two most recent ACT based treatment intervention studies together with the earlier studies show that ACT based approaches have the potential to improve emotional eating for improved weight loss maintenance. Despite some of the conclusions drawn being based on trends, the cumulative evidence suggests that ACT as an intervention on its own or combined with traditional behavioural strategies is helpful and perhaps most helpful for people with high levels of emotion eating. There are suggestions that food and weight related experiential avoidance is a potential mechanism of action; however generally formal mediation analyses have not been employed and assertions are often based on simple correlations thereby limiting these assertions. Within the seven publications reviewed in this section three different measures of experiential avoidance have been employed which leads to difficulties in pattern identification between studies with regard to experiential avoidance. Also, again the, related, yet distinctiveness of disinhibition and emotional eating is often not distilled, which acts to obscure the unique contribution emotional eating may be contributing to weight related outcomes. Broad limitations of the collective studies in this section is high attrition and the generalisability of the findings beyond middle-aged, Caucasian females, however this is consistent with the weight related literature already presented. It is noteworthy that although each study is based on ACT there is heterogeneity in the accounts of specific ACT content elicited, and also a significant difference in the length of the ACT interventions ranging from 30 minutes to 1 x 8 hour session to 24 x 1 hour sessions. This

heterogeneity could be seen as a positive sign as even brief ACT based interventions are showing positive changes for weight related outcomes. One significant limitation of the collective to these studies is the absence of measures of cognitive defusion. Given the theoretical importance of cognitive fusion together with experiential avoidance within the ACT model it is surprising to find that beyond discussion of the suspected importance of cognitive fusion, little attempt has been made to measure this key process. This limitation can be explained to some degree by the fact that it is only recently that valid and reliable measures of cognitive fusion have become available. There are two recent studies that despite not measuring cognitive fusion per se, nonetheless extend the literature into the area of cognitive fusion and food cravings showing that cognitive defusion instruction as a distinct component of ACT is helpful for food cravings and craving related food consumption. Next, these two studies are reviewed very briefly.

Hopper, Sandoz, Ashton, Clarke and McHugh (2012) recognised that thought suppression, a cognitive coping strategy involving efforts to ignore or deny thoughts, is often used as a coping strategy for people trying to handle food craving related consumption. Evidence shows however that thought suppression is an unhelpful avoidance based coping strategy. It is unhelpful in the same way as all experiential avoidance efforts, it in that amplifies the unwanted experiences. Thought suppression is an avoidance technique thought to be fuelled by cognitive fusion when contextualised within the ACT model. Hopper et al. (2012) hypothesised that thought suppression would be an unhelpful coping strategy for people trying to manage their weight and instead cognitive defusion would be more helpful for food cravings. As such, Hopper et al. (2012) compared the effects of a short instruction in defusion with suppression in the context of food craving. Participants ($N = 17$) were undergraduate students (Age $M = 21.37$, 32 female and 22 male) who were assigned to one of three conditions: 1) thought suppression ($n = 17$), 2) cognitive defusion ($n = 16$), and 3)

control ($n = 14$). Measures included were: the number of cravings experienced and the amounts of chocolate eaten across a 1-week abstinence period and during a taste test. Mixed results were found. There were no significant differences found between the groups in consumption of chocolate over the week; however there was a significant difference in the amount of chocolate eaten during the taste test with the cognitive defusion group eating significantly less $p < .05$. This result was interpreted as showing that the suppression group “experienced a behavioural rebound effect; eating significantly more chocolates than the other groups on the taste test” (p. 63). The rebound effect assesses whether people increase their food intake after an externally imposed restriction period ends, analogous to diet restrictions. As a result the authors say that it is possible “that defusion prevents a rebound in eating an avoided food from occurring following a period of abstinence, while thought suppression only serves to increase the rebound” (p. 64). The authors also reported that the defusion group ate in response to 50% of their cravings compared to the control group 61% and the suppression groups 78%; however this data was not statistically analysed so needs to be interpreted with caution. Despite the mixed finding the authors concluded that “overall these findings suggest that defusion may be more effective than thought suppression for dealing with food cravings” (p. 64). Limitations of the study include the absence of a cognitive fusion measure which means that the conclusions drawn are based on the assumption that the results are actually a result of changes in cognitive fusion. The results would have been significantly strengthened if pre and post-measures of cognitive fusion, and thought suppression, were included. Further there were no baseline measures reported to indicate if each group were equal on measure before the intervention. This means the results may or may not reflect changes resulting from the intervention. Given that this study constitutes the first study to explore cognitive defusion as a component of ACT in the context

of food consumption it is an important study nonetheless because it provides further evidence of the utility of ACT based approaches within the area of weight and eating behaviours.

Similarity to Hopper et al. (2012), Moffitt, Brinkworth, Noakes and Mohr (2012) cited that food craving is related to the overconsumption of food which is in turn associated with the onset and maintenance of obesity. Moffitt et al. (2012) articulated that to improve weight management, including urges and overeating, elucidation of optimal cognitive coping strategies need to be distilled. They cite that the cognitive strategy of cognitive restructuring, a component of cognitive behavioural theory, has been well researched and been shown to help modify eating behaviours, while the novel strategy of cognitive defusion, as a component of ACT, is under researched but shows a trend toward effectiveness. Briefly, Moffitt et al. (2012) described cognitive restructuring as modifying the content of thoughts to change their form and frequency; conversely, cognitive defusion involves noticing and observing thoughts without attempts to modify or avoid them, as described in detail earlier. Moffitt et al. (2012) designed an analogue study similar to Formen et al. (2007) to compare the utility of cognitive restructuring and cognitive defusion. Participants were adults representative of a general community sample who identified as chocolate cravers and had a desire to better manage their eating behaviours. They were randomly assigned to either a wait-list condition ($n = 36$), a cognitive restructuring condition ($n = 36$) or a cognitive defusion condition ($n = 38$). Interventions were 60-minute instructional DVD presentations. Similar to Forman Hoffman et al. (2007) participants were given transparent bags containing chocolate and instructed to resist eating them for a 7-day period. Pre and post-measures included amount of chocolate consumed, chocolate cravings state and trait, automatic thoughts, dysfunctional attitudes, self-efficacy, and experiential avoidance as measured by the original Acceptance and Action Questionnaire (AAQ: Hayes et al., 2004). It was found that participants were 3.26 and 4.61 times more likely to be abstinent from chocolate eating if

they were in the cognitive defusion condition as compared to the cognitive restructuring condition and control condition respectively. There was a non significant trend showing that overall consumption was lower in the cognitive defusion group, and when cognitive distress was trichotomised into low, medium, and high the positive effect of cognitive defusion for those within the high range of cognitive distress became statistically significant. The results also showed that both the cognitive defusion condition and cognitive restructuring condition were helpful at medium levels of distress and both were more helpful than the control condition. The authors suggest that cognitive defusion may be a more appropriate strategy to deal with thoughts that are more difficult to deal with than trying to change or challenge them in the context of unhelpful eating behaviours. A significant strength of this study lies in its aim to compare two specific cognitive strategies or components of broader therapy approaches. Weaknesses of the study include mean BMI being within the low range of overweight ($m = 26.58$) meaning that the results may not be generalisable to those struggling most with weight management. Height and weight also relied on self-report. Again, generalisability is limited to the composition of the sample being mostly middle-aged ($m = 46$ years) and female (85%). The AAQ measure that was used was not the most current measure so may go some way to explain why no significant results were found. Considering this study was specifically designed to explore cognitive defusion, it is surprising that no psychometrically valid and reliable measure of cognitive fusion was included in the study, inclusion would have strengthened the findings. Despite the limitations this study is important because it compares two specific cognitive coping strategies and shows that cognitive defusion may be more beneficial for people experiencing a high level of difficulties, with the authors concluding that the “findings provide a strong case for the superiority of cognitive defusion of cognitive restructuring as a strategy to manage food cravings” (p. 85). Overall, this finding provides further support for extending of ACT

treatment intervention research into the area of weight loss maintenance and emotional eating as both broad ACT approaches and component analyses are combining to show that ACT is effective in weight, food and eating behaviours related studies.

3.8 Summary of Acceptance and Commitment Therapy and Weight Related Research

Overall there are nine empirical research studies published specifically relating to ACT and weight or eating behaviour that provide impetus to explore emotional eating and weight loss maintenance within the context of an ACT treatment intervention. Together the heterogeneity of the ACT based interventions and instructions explored in these studies act to provide strong evidence that ACT is likely to be effective within this area; however a number of limitations exist in the available research. This includes little consensus of which quantitative measure should be included, for example different measures of experiential avoidance are used which acts to limit the identification of patterns between studies and there is an absence of cognitive defusion measures included. It also appears that similar to the weight loss maintenance literature, there is no acknowledgement of the potential conceptual and measurement overlap between emotional eating scales and the disinhibition scale which includes both emotional eating and dichotomous thinking items. There is also a need for more pre and post-measures and data analyses to provide empirical support for claims made about underlying mechanisms of action that are often cited, yet not supported through mediation analyses. It is also not uncommon for trends to be reported, as opposed to statistically significant results which also limits the interpretations made by authors in their discussions. It is possible that with larger samples providing adequate power for data analyses these trends would be found significant. The generalisation of the results is also limited, similarly to the weight loss maintenance literature, because the samples are overwhelmingly middle-aged females. Despite these limitations the trends, together with the significant results, all point in

the same direction and suggest that an ACT treatment intervention would most likely be effective in decreasing emotional eating for improvements in weight loss maintenance. The assertion that ACT is likely to be beneficial within the domain of weight is further supported by research published recently within the domain of ACT and eating disorders, and is also supported by research within the domain of ACT and health related behaviour change. Next the domain of ACT and eating disorders is reviewed, and following that the domain of ACT and health related behaviour change is briefly reviewed. After that a brief section summarises the amalgamation of emotional eating and ACT, and explains why an ACT treatment intervention for emotional eating makes sense. To end, a full summary of Chapter Two and Three is presented which leads to the global aim, research questions and hypotheses that derived from this literature review.

3.9 ACT Research within the Area of Disordered Eating

Evidence from the domain of ACT and disordered eating comport with investigations of ACT and overweight and obesity because of the common concern of weight management and the probable underlying mechanism of action being experiential avoidance. Barnes and colleagues have recently published a number of studies collectively showing that “food thought suppression is predictive of eating disorder-related pathology” (Barnes & Tantleff-Dunn, 2010, p. 178), and as outlined earlier thought suppression is an unhelpful avoidance based coping strategy. Barnes and colleagues’ studies mainly focus on the association between food related thought suppression, binge eating symptomatology, binge eating disorder psychopathology in the context of overweight and obesity, and the utility of third wave behaviour therapy and ACT (Barnes & Tantleff-Dunn, 2010). Key findings of their research include that in a correlational cross sectional design study of a community sample of 312 obese people, they found that food thought suppression predicted “binge eating, food cravings, and other disordered symptoms” (Barnes & Tantleff-Dunn, 2010, p. 175). In a

separate study they found that amongst obese women with binge eating disorder, higher levels of food thought suppression were associated with higher frequency binge eating (Barnes, Masheb, & Grilo, 2011, p. 727). The Food Thought Suppression Inventory has also recently been validated with a sample of obese women with binge eating disorder ($N = 127$) and through this process it was found that “food thought suppression was related to higher levels of eating and general psychopathology” (Barnes, Sawaoka, White, Masheb, Grilo, 2013, p. 35). With specific regard for this review’s focus, Barnes & Tantleff-Dunn (2010) stated that their results “suggest that the use of thought suppression also predicts experiences and behaviors that may be related to overeating and obesity” (p. 178) and they made specific reference to the utility of ACT as an intervention in the treatment of obesity.

In addition to Barnes and colleagues’ work there is also research emerging showing support for the utility of ACT within the area of eating disorders, subclinical eating pathology, and body dissatisfaction. A brief outline of the recent publications are presented next for the reason that these findings comport to the notion that ACT may be a helpful psychological treatment intervention for targeting emotional eating which can be viewed on the spectrum of unhelpful eating behaviour. The emerging results suggest that ACT based interventions might be more helpful, and may even be superior, to cognitive behavioural therapy in ameliorating disordered eating symptoms. Most results in this specific area however need to be interpreted with caution as significant trends are reported alongside results of statistical significance. For example, Juarasico et al. (2013) recently published results of their research that investigated the efficacy of an ACT based treatment ($N = 66$) compared to treatment as usual (TAU: $N = 74$) within a population of adult residential patients with eating disorders, either anorexia nervosa or bulimia nervosa. The primary aim was to find if the ACT condition produced larger decreases in disordered eating than TAU. As a whole the results elicited a pattern showing that those who received the ACT

intervention showed better outcomes. They noted “individuals in the ACT condition trended toward lower global eating pathology, shape concerns, and weight concerns by post-treatment, as well as greater willingness to consume a distressing food” (p. 479). Patients in this condition also trended toward greater increases in psychological flexibility as measured by the AAQII (Bond et al., 2011). Clinically significant was the result that showed 38% of the people who received the ACT treatment who fell within the clinical range at pre-treatment were within the normative range post-treatment, compared to 17% of those who received TAU. Further, results suggested that there was poorer maintenance of treatment gains with those in the TAU group “more likely to be rehospitalised (18%) compared to the ACT group 3.5%” (p. 475). The authors conclude that given that this is one of the “first empirical tests of an ACT based treatment for eating disorders” the results suggest that “ACT may be a useful treatment for eating disorders” (p. 483). Disordered eating in association with psychological inflexibility has also recently been investigated by Masuda and Latzman (2012). Using a cross-sectional design they found that bulimia/food preoccupation was significantly and uniquely associated with psychological inflexibility ($\beta = -0.20, p < 0.01$). They note however that although they found significant associations they were small and should be interpreted with caution and are analogous with a trend. It would be remiss not to mention here that mindfulness-based interventions as conceptualised as third wave behaviour therapies, including ACT, have recently been championed as having the potential to ameliorate eating disorder symptomatology, which to date has remained fairly intractable. Despite anecdotally being used widely in clinical practice with success, a very recent review of the empirical literature shows that there is very limited evidence pertaining to its effectiveness at this time. For a systematic review see Masuda & Hill (2013). These recent results however provide cumulative evidence that ACT may be effective within this area.

As well as showing trends toward effectiveness for disordered eating for those with clinically low weight, a recent ACT intervention study has been published showing that ACT targeting emotional eating can improve outcomes for people who have clinically significant high weights and as a result undergo bariatric surgery. Weineland, Ardidsson, Kakoulidis and Dahl (2012) outlined that emotional eating has been shown to predict poorer outcomes for people who undergo bariatric surgery because the surgery does not address the psychological reasons why people overeat. To address this they conducted a RCT of an ACT intervention ($n = 19$) compared to TAU ($n = 20$). Overall the results showed significant improvements for those who attended the ACT intervention including disordered eating, body dissatisfaction, quality of life, and importantly improvements on the Acceptance and Action Questionnaire for Weight (AAQW: Lillis & Hayes, 2008), pre to post mean for ACT = 82.37 to 69.00 compared to TAU = 83.75 to 82.80, $p = .006$. The authors concluded stating that “this study shows that it is possible to improve effects of bariatric surgery by specifically targeting emotional eating behaviour” (p. e21). In addition to eating disorder symptomatology, there are three recent publications that explore subclinical disordered eating and the related facet of body dissatisfaction in the context of ACT with results suggesting ACT may provide positive advancement in the treatment of these concerns. These three studies are briefly presented next.

Firstly, Juarascio et al. (2010) investigated the effectiveness of an ACT intervention in comparison to cognitive therapy in reducing subclinical eating pathology. Participants ($N = 55$) were randomly assigned to ACT ($n = 27$) or cognitive therapy ($n = 28$). Measures included eating pathology, global functioning, quality of life, anxiety, and depression. The results showed that both therapy conditions ameliorated eating pathology symptoms, however “ACT (pre to post-treatment Cohen’s $d = 1.89$) was shown to be superior to cognitive therapy ($d = 0.48$) at reducing problem eating behaviour” (p. 185). There was also a strong trend

showing that ACT was superior in improving global functioning for those with more severe eating pathology. Secondly, Pearson, Follette and Hayes (2012) recently published a pilot study exploring the efficacy of a 1-day ACT workshop intervention “targeting body dissatisfaction and disordered eating attitudes” (p. 181). Participants ($N = 73$) were randomised to either the ACT condition ($n = 39$) or a wait-list condition ($n = 34$). Outcomes included eating attitudes, body anxiety, preoccupation with eating, weight and shape as well as two experiential avoidance measures AAQ and AAQW. Results showed that a 1-day ACT workshop was superior as compared to a wait-list control condition plus self-monitoring in reducing disordered eating attitudes and body anxiety (p. 189). The results also showed that the ACT group showed “significant increases in acceptance when compared to the wait-list control condition” as measured by the AAQW (p. 181). The authors conclude that “these findings provide preliminary support for ACT as a brief intervention model for distress associated with body image dissatisfaction” (p. 189). The third study is by Lillis, Hayes and Levin (2011) and uses data extracted from Lillis et al. (2009) not published in the original paper, and explores binge eating and experiential avoidance. Given that the method of Lillis et al. (2009) has already been detailed, only results are presented now, except to say that binge eating was measured by participants answering the question “On average, how many days per week did you have a binge?”, with participants instructed to circle 0 - 7. They found that binge eating and the AAQW were significantly related $R^2 = .13, p < .001$, that those in the ACT condition reported less binge eating, and that the AAQW mediated binge eating changes at 3-month follow-up. Lillis et al. (2011) concluded that “targeting binging is a possible pathway for improving weight management” (p. 252). Lillis, Levin and Hayes (2011) published another, third, paper using the same data set as Lillis et al. (2009) and found that experiential avoidance mediated the relationship between high BMI and low health

related quality of life and suggested that experiential avoidance could be targeted to improve obesity related quality of life irrespective of concurrent weight loss.

3.9.1 Summary ACT research and the area of disordered eating. As a whole the research emerging from the domains of eating disorder symptomatology, subclinical disordered eating including binge eating, and the related facet of body dissatisfaction within the context of the ACT model shows that ACT based interventions are effective or show trends toward effectiveness. In describing this last group of studies, the results showing the effectiveness of ACT have been highlighted with little mention of limitations. This is because the significant limitations of the ACT literature as it pertains to weight loss maintenance has already been articulated in this paper and the limitations found in this group of studies are not dissimilar to those already listed. The main purpose of presenting this group of studies was to show that ACT is being widely applied to the domain of weight and in most cases indicates positive results indicating further research exploring the effectiveness of ACT within the domain is warranted. With the same premise in mind, the following section details a few key studies that explore the utility of ACT for health related behaviour change.

3.10 ACT and Health Related Behaviour Change

There are a number of studies that demonstrate that ACT is effective in facilitating health related behaviour change, for example increasing physical activity (Butryn, Forman, Hoffman, Shaw & Juarascio, 2011; Tapper et al., 2009), smoking cessation (Gifford et al., 2004), improving health behaviours for cardiac patients (Goodwin, Forman, Herbert, Butryn, & Ledley, 2012), and diabetes management (Gregg et al., 2007). Given the association between obesity and diabetes, it would be remiss not to include a brief description of the study that explores an ACT treatment intervention for Type II Diabetes which resulted in improvements in BMI and diabetes self-management (Gregg et al., 2007). Self-management of Type II Diabetes and self-management of weight loss maintenance are related since

unsuccessful weight maintenance can increase a person's risk of developing or exacerbating Type II Diabetes. In addition, both weight loss maintenance and the management of diabetes involve monitoring food consumption or diet and engaging in physical activity. Diabetes self-management also includes blood glucose monitoring and self-administration of medications. Similar to weight loss maintenance, behavioural education alone does not appear to produce adequate levels of self-management. Again, in a similar vein to weight loss maintenance, Type II diabetes self-management strategies have traditionally been based around strategies of control, including controlling thoughts and feelings in an attempt to reduce both the distress related directly to the disease and also secondary distress associated with self-management such as injections of insulin. In accordance with the theory of ACT, Gregg et al. (2007) hypothesised that experiences of negative affect and unpleasant symptoms of Type II Diabetes are inevitable and that the control strategies used to avoid these negative states using traditional self-management strategies may be counterproductive. As an alternative, they hypothesised that an ACT treatment intervention may be a more realistic approach to self-management. To test this hypothesis, they randomly assigned participants to education alone ($n = 38$) or ACT and education ($n = 43$). Outcome measures included glycated haemoglobin (HbA1c: lower levels indicate reduced likelihood of diabetes related complications) and self-management which included exercise, diet and glucose monitoring. Also included was an experiential avoidance measure for diabetes called the Acceptance and Action Diabetes Questionnaire (AADQ) which was designed as part of the study. Base-line and 3-month follow-up data were assessed. It was reported that at the 3-month follow-up participants in the ACT condition were more likely to report better adherence to self-management strategies and to have HbA1C within a healthy target range compared to those in the education alone condition. Mediation analysis showed also that a reduction in diabetes-related experiential avoidance, or alternatively an increase in acceptance, was the mechanism of action in

increasing better self-management in this study. This study is important in the context of weight loss maintenance because like diabetes management it requires engagement in ongoing health behaviours. This study showed that ACT facilitated better health behaviour outcomes while also showing that experiential avoidance was the mechanism of action underlying better self-management. There are also a few studies showing that ACT may be helpful for physical activity.

As reported earlier, Tapper et al. (2009) found that their ACT based intervention significantly increased rates of physical activity, a finding partially supported by Butryn, et al. (2011). Butryn et al. (2011) randomised participants to an ACT condition ($n = 35$) or education condition ($n = 19$), with outcome measures including visits to the gym, mindfulness, defusion measured by the Drexel Defusion Scale (DDS: Forman, Herbert, & Moitra, 2008 as cited in Butryn, et al. (2011), and physical activity acceptance and action measured by the Physical Activity Acceptance and Action Questionnaire (PAAAQ) which was developed for this study. Outcome measures were recorded at baseline, post intervention and follow-up. The results showed that at post-intervention the people in the ACT group visited the gym significantly more than the education group; this effect was however not significant at follow-up. The results also showed that participants in the ACT group scored significantly better on the defusion scale than the education group, but there was no significant difference for the PAAAQ. The authors are modest in their conclusions stating that the results show that ACT has potential in increasing physical activity. Physical activity was also an outcome variable in a recently published study that explored the effectiveness of an ACT based intervention targeting diet and physical activity amongst cardiac patients (Goodwin, et al., 2012). Participants ($n = 16$) were recruited from an outpatient cardiac unit and were within or over the BMI range of overweight. The intervention constituted four 90 minute sessions that focused on increasing heart-healthy lifestyle behaviours and borrowed

from the LEARN manual for weight loss and previous acceptance based interventions founded in ACT used by Forman and colleagues. Outcome measures included physical activity, mindfulness, defusion as measured by the Drexel Defusion Scale (DDS), food acceptance (FAAQ) and physical activity acceptance (PAAQ). Overall the analysis elicited positive results although some constituted trends instead of being statistical significance. Statistically significant differences were found for calorie and fat intake, and reductions in “absolute weight and BMI ($d = -0.13$; -2.2kg ; $-.77\text{kg/m}^2$)” (p. 209). Improvement trends were found for food related acceptance $p = .06$ and physical activity acceptance $p = .05$. The authors are again modest in their conclusions suggesting that these results are the first to begin to elucidate how an acceptance based intervention might be effective for cardiac patients health behaviour change.

These last few studies show that there is mounting evidence for the utility of ACT within the health related behaviour change domain. Coupled with the previous evidence presented these studies provide complementary evidence that a future research project exploring an ACT treatment intervention targeting emotional eating in the context of weight loss maintenance is grounded in literature showing that ACT is likely to be effective. The next section explicitly articulates why an ACT treatment intervention for emotional eating in the context of weight loss maintenance makes sense.

3.11 Why an ACT Treatment Intervention for Emotional Eating Makes Sense

The premise of this review is simple. People use emotional eating to avoid difficult internal experiences. They therefore eat for reasons other than physiological hunger and as a result their dietary intake exceeds their body’s energy needs with excess energy leading to weight gain and the development and maintenance of overweight or obesity and contributes to unsuccessful weight loss maintenance. People use emotional eating as an unhelpful strategy to avoid unwanted internal experiences in the absence of more helpful ways to deal

with difficult feelings and thoughts. In this way emotional eating can be conceptualised in terms of experiential avoidance. The function of experiential avoidance is avoidance of unwanted internal experiences. Thus the functional consequences of experiential avoidance and emotional eating are analogous. ACT theoretically holds that experiential avoidance strategies are maintained because the immediate consequence of avoidance is that people feel better and this short-term relief acts as a reinforcer despite the increased long-term disadvantages of avoidance. Congruently, emotional eating is a behavioural trap - feel better now but feel even worse later. People engage in emotional eating even though they know that in the long run it doesn't help, they know it is unworkable, but they get caught up in the vicious cycle of the emotional eating avoidance snowball effect. In matching the functional consequences of emotional eating and experiential avoidance as done here it is clear that there is a conceptual link between emotional eating and experiential avoidance and this conceptual link is upheld within the emerging empirical research where emotional eating is seen to be a result of avoidance. The ACT treatment intervention research as presented here also shows that ACT as a therapeutic intervention including the targeting of experiential avoidance is likely to be effective for emotional eating.

Despite the lack of empirical evidence cognitive fusion is also often cited as contributing to significant positive results in ACT treatment intervention studies. This supposition is based on the theory that within the ACT model experiential avoidance and cognitive fusion work alongside each other. As detailed, there are now some very preliminary results within the ACT literature showing that cognitive fusion may be able to provide statistically significant predictive variance within weight and eating behaviour outcomes. Further, the context provided by Gregg, Almand, and Schmidt (2011) contributes additional support for the exploration of cognitive fusion within the weight loss maintenance equation. Specifically Gregg et al. (2011) describe dichotomous thinking as “reflecting” cognitive

fusion (p. 84). They describe dichotomous thinking as ‘all or nothing thinking’ and cognitive fusion as inflexible ‘verbal rules’ attached to thoughts and experiences, where both processes decrease psychological flexibility and the engagement in valued actions (p. 83). Both processes can be seen as the unhelpful application of rigid verbal rules that limit a person’s ability to engage in valued actions. It is noteworthy that the similarities and differences between dichotomous thinking and cognitive fusion have not been empirically explored so conceptual and construct overlap are yet to be clearly delineated. Nonetheless, the commonality between the two constructs means that the significant results from the weight loss maintenance literature showing that dichotomous thinking, and its inverse flexible cognitive restraint, provides significant and predictive value to the weight loss maintenance equation and can be seen to comport with the probability that cognitive fusion may also provide significant and predictive value (Byrne, 2004; Teixeira et al., 2010). Overall, the cumulative literature suggests that experiential avoidance and cognitive fusion may be two underlying mechanisms of action driving emotional eating and unsuccessful weight loss maintenance. Consequently it is not unreasonable to predict that an ACT treatment intervention is likely to be helpful for emotional eating in the context of weight loss maintenance.

ACT as a psychological treatment intervention has the potential to interrupt the avoidance cycle of emotional eating and in turn facilitate weight loss maintenance by targeting experiential avoidance and cognitive fusion along with the four other unhelpful processes that see people disengage with the behavioural strategies they know help them maintain their weight loss. Conversely, ACT as a psychological treatment intervention will teach people the six helpful processes that will enable them to engage in workable actions and adhere to helpful behaviour strategies to achieve their goals whilst experiencing the ups and downs life is invariably going to offer them.

Next a brief ACT summary is provided which is then followed by a global summary of the literature reviewed in Chapters Two and Three. After that the research aim, questions and hypotheses for the empirical research study born from this literature review are presented.

3.12 Chapter Summary: Acceptance and Commitment Therapy

This chapter has described ACT in detail and presented the empirical evidence supporting the proposition that an ACT treatment intervention may be helpful for emotional eating and weight loss maintenance. In sum, ACT as a psychological treatment intervention teaches people to: “obtain psychological distance (i.e., defuse) from distressing internal experiences; clarify overarching personal values; create goals that can help patients live a more fulfilling, meaningful life; and increase willingness to experience negative internal experiences in the service of valued behaviour” (Juarascio et al., 2013, p.461).

Chapter 4

Global Summary of the Literature and the Current Study

4.1 Global Summary of the Literature

The evidence is clear that successful weight loss maintenance is a significant problem in the context of the formidable consequences of increased mortality and morbidity associated with overweight and obesity. The antidote to overweight and obesity is weight loss, however only successful weight loss maintenance results in sustained health benefits. While traditional behavioural strategies dominate the research treatment trials and empirical literature, there is a gap within the literature in explaining why approximately 80% of people who lose weight are unable to successfully maintain that lost weight. To help explain this phenomenon some researchers have called for psychological factors to be explored in an attempt to explain unaccounted for variance in the weight loss maintenance equation. One variable found to have the potential to account for this is emotional eating.

Despite the limited research, and heterogeneous research methods employed, the empirical findings consistently show that emotional eating is likely to account for variance within the weight loss maintenance equation. Emotional eating is defined as “the tendency to eat in response to emotional distress” (Canetti et al., 2009, p. 109). The functional consequence of emotional eating is avoidance of emotion. The mechanism of action underlying emotional eating is theorised to be avoidance style coping and the cumulative empirical literature is now coming together to support this understanding of emotional eating. As such, emotional eating is not related to the actual experience of emotion but a result of avoidant style coping, or simply avoidance, which is an unhelpful and counterproductive coping strategy.

The cumulative literature elucidating avoidance as emotional eating’s underlying mechanism of action as opposed to exposure to emotion per se has significant practical

implications for treatment because it points to avoidance as the therapeutic target of psychological interventions “and thus removes an important instigator of emotional eating” (Evers et. al., 2010, p. 801). As articulated by Evers et al. (2010) “although it may sometimes be impossible to avoid experiencing negative emotions it may be possible (though perhaps complicated) to change the way we regulate emotion” (p. 801). This premise comports completely with the philosophical underpinning of ACT which “accepts the ubiquity of human suffering” and holds that the entire spectrum of human emotion, including unwanted experience, is normal and should not be avoided, and that it is the over application of avoidance style coping, known as experiential avoidance, that is ultimately responsible for the development and maintenance of human suffering. Similarly, Evers et al. (2010) articulate that it is not the pain or distress or emotion in and of itself that does damage or equates to suffering, but people’s attempts to control and avoid it that leads to suffering. For those experiencing psychological pain avoidance seems intuitive and helpful; however, it is now widely documented that avoidance or experiential avoidance is paradoxical and amplifies the original avoided unwanted material.

ACT as a therapeutic treatment intervention aims to teach people that experiential avoidance is unhelpful and likely to be increasing and maintaining their struggles. It does this by targeting experiential avoidance, and teaching the inverse helpful process of acceptance. ACT treatment also targets cognitive fusion and, once again, teaches the inverse helpful process of cognitive defusion.

Emerging literature shows that cognitive fusion may also be a mechanism of action underlying emotional eating in the weight loss maintenance equation. Cognitive fusion is a process whereby people ascribe to inflexible verbal rules that decrease valued actions like those needed to be adhered to for successful weight loss maintenance. Experiential avoidance and cognitive fusion are described in the ACT literature as the two core processes

that work alongside each other to contribute to the four other unhelpful process that maintain psychological suffering which are: disconnection with the present moment, attachment to conceptualised self, disconnection to values, and inaction. The four inverse helpful processes taught in ACT treatment interventions are present moment awareness, self as context, chosen values, and committed action.

There has recently been an amalgamation of the weight management research domain and the ACT research domain which has produced findings that suggest ACT as a therapeutic treatment intervention may be helpful in “augmenting” weight management (Lillis, et al., 2009, p. 58). The available research points to the prospect that an ACT treatment intervention could be effective in targeting emotional eating for improved weight loss maintenance. Specifically, Lillis et al. (2009) found a 1-day ACT intervention to be effective in augmenting weight loss and weight loss maintenance, however despite acknowledging that eating in response to emotions may be contributing to unsuccessful weight outcomes they did not measure this variable. This omission along with the general hitherto under exploration of emotional eating within the weight loss maintenance literature left a gap in the research to be filled.

This gap, however, was not first left by Lillis et al. (2009) but has been present since at least 1973 when researchers began to call for the underlying mechanisms of action driving emotional eating in the context of weight loss maintenance to be elucidated. This call was robustly restated by Byrne and colleagues (2002; 2003) and others joined from 2009 collectively stating that psychological interventions “should focus on reducing emotional eating” (Teixeria, et al., 2010, p. 733); “psychological treatment strategies have to be developed to overcome emotional eating and thereby end the weight gain epidemic” (Koenders & van Strien, 2011 p. 1292); “patients with obesity resulting from emotional

eating or hedonic hyperphagia are most likely to benefit from psychological or psychiatric interventions rather than simply from dietary counselling” (Sharam & Padwal, 2010 p. 366).

Despite the chorus of calls to explore “novel strategies to promote weight loss maintenance” (Turk et al., 2009, p.77) at the time this research was articulated no other study had the explicit aim of investigating emotional eating along with weight loss maintenance using a novel psychological intervention while also exploring potential mechanisms of action underlying emotional eating.

The research that follows constitutes the first intervention study to quantitatively bring together ACT and its two core processes of experiential avoidance and cognitive fusion with emotional eating in the context of weight loss maintenance. The results have the potential to contribute to innovative new ways of improving emotional eating and weight loss maintenance.

4.2 The Current Study

The global aim of the current study was to evaluate the efficacy of a 1-day ACT group based workshop treatment intervention for people who have recently lost weight targeting emotional eating to facilitate improved weight loss maintenance, using a randomised controlled trial design comparing a treatment group to a wait-list control group.

4.2.1 Specific research questions and hypotheses

1. Will participants who attend the 1-day ACTing on Weight group workshop show significantly improved outcomes compared to participants in the wait-list control group?
 - 1.1 It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will show significantly improved weight outcomes compared to participants in the wait-list control group.

- 1.2 It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will show significantly improved emotional eating outcomes compared to participants in the wait-list control group.
 - 1.3 It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will show significantly improved experiential avoidance outcomes compared to participants in the wait-list control group.
 - 1.4 It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will show significantly improved cognitive fusion outcomes compared to participants in the wait-list control group.
 - 1.5 It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will show significantly improved outcomes compared to participants in the wait-list control group in a range of subsidiary variables of interest including: health and subjective well-being.
- 2 Will core mechanisms of action within the ACT model mediate changes in outcome measures?
 - 2.1 It is hypothesised that experiential avoidance will mediate changes in outcome measures, specially weight and emotional eating.
 - 2.2 It is hypothesised that cognitive fusion will mediate changes in outcome measures, specially weight and emotional eating.

Chapter 5

Methodology

This chapter is dedicated to describing the methods involved in executing this research study. It includes detailed descriptions of the study's overall design including: (a) the randomisation procedure, (b) recruitment methods and activities, (c) participant contact points, (d) eligibility criteria and registrations procedures, (e) data collection methods, measures and data collection points. It also provides a summary of the 1-day ACTing on Weight group workshop treatment intervention protocol.

5.1 Study Design and Randomisation Procedure

The current study constituted a randomised controlled efficacy trial of a 1-day ACT group based workshop for emotional eating and weight loss maintenance using quantitative data collection methods. The study was called ACTing on Weight. Eligible participants were randomly assigned to either the treatment group or the wait-list control group. The randomisation technique used was set up by Associate Professor Elmer V Villanueva, an independent third party who volunteered his time to do this to help facilitate unbiased randomisation. At the time of the execution of the randomisation Associate Professor Villanueva was the Director of Research at the Gippsland Medical School at Monash University. The randomisation was based on a permuted block design, with random block sizes of 2 or 4, and was conducted using Stata 11.1 (StataCorp PL, College Station, Texas, USA). Both groups attended the 1-day ACTing on Weight group workshop that constituted the treatment intervention; however, the wait-list control group waited three months to attend their workshop. At the face-to-face registration session participants were allocated to workshop dates according to their randomisation. Participants were not informed as to whether they had been allocated to the treatment or wait-list condition; they only knew that there were numerous 1-day ACTing on Weight group workshop dates they could be allocated

to, and that some dates were earlier than others. The treatment groups' pre-measures were administered on the day of the workshop, before it commenced, and then post-measures were administered at the 3-month follow-up session. The wait-list control groups' pre-measures were assessed three months before their workshop, which was during the registration session, and then post-measures were assessed at the three-month date which was on the morning of the day of their workshop. More details about the procedure are detailed in the 'Procedure' section. The study actively ran from the commencement of recruitment in February 2010 to the running of the last group in November 2011.

5.2 Recruitment

The initial recruitment strategy commenced in February 2010 and was designed to elicit a target sample of 128 as estimated by G-Power (Faul, 2007) to enable the identification of at least moderate effects. Data collection was scheduled to conclude in December 2010. Despite the significant effort put into the recruitment of participants throughout 2010, the recruitment effort failed to elicit enough participants to employ the statistical analysis techniques the study had been designed to use, as well as the questions the study had been designed to explore. Given this, it was decided that another year of recruitment and data collection would take place, and this happened throughout 2011. Below is a detailed account of the recruitment activities conducted throughout 2010 and 2011.

5.2.1 Recruitment activities. Participants were recruited from the general population via a broad range of media including: (a) newspaper advertisements; (b) magazine, newspaper and other published articles; (c) media releases; (d) internet media including a dedicated website and Facebook page; (e) direct mail to health related organisations; (f) research posters in public places; (g) public newsletters; (h) social media forums. All recruitment information provided a mobile phone number and an email address for people to use to express their interest in volunteering for the study (see Appendix A for an

example of the study recruitment poster). For recruitment and marketing purposes the research was called and referred to as the “ACTing on Weight” research study. Incentives were included in the study recruitment material and included a travel reimbursement of \$20 and a chance to win a \$50 department store gift voucher. On contacting the doctoral candidate and author of this thesis, and indicating a desire to participate in the study, potential participants were provided with a brief description of what participating in the study would involve including the time commitment, the number of face-to-face contact visits, the location of visits and the hypothesised benefits of the workshop. On initial contact, the eligibility criteria were also assessed. Eligibility criteria were BMI within the healthy weight range or above, participants who had lost at least 5% of their starting weight within the last 6 months, those aged over 18 years, those who had not given birth during the previous year and were not currently pregnant, and those willing to voluntarily participate in the study.

5.2.1.1 Magazine, newspaper and other published articles. The editors of various health and fitness related magazines and journals were contacted regarding the research, resulting in five articles being published.

2010: Women’s Health magazine

Title: Psych Up, Slim Down.

Article premise: A cover story about ACT and Weight including quotes from the doctoral candidate of this study (see Appendix B).

2011: UltraFIT magazine

Title: ACT Now: How Acceptance and Commitment Therapy Can Help you Reach your Goals.

Article premise: A cover story focusing on ACT and how it impacts emotions, weight and performance, including quotes from the doctoral candidate of this study. The

author of this article worked pro bono on it specifically to promote the research (see Appendix C).

2011: Women's Health and Fitness magazine

Title: Emotional Eating.

Article premise: An in-depth look at emotional eating and how ACT may help, including quotes from the doctoral candidate of this study. The doctoral candidate of this study provided written answers to questions emailed by the author of the article and much of the information provided is included in the article (see Appendix D).

2011: The Preventative Health Journal

Title: ACTing on Weight.

Article premise: This journal published the 2011 Media Release verbatim (see Appendices E and F).

2010: Waverley Leader Newspaper

Title: Emotion Taking You Over.

Article premise: Feature story about the research and doctoral candidate (See Appendix G). *Note:* The Monash University Marketing Department facilitated the Leader Newspaper publishing an article about the study.

5.2.1.2 Media releases. In 2010, a media release supported by the Monash University Marketing Department was edited and disseminated by the department. This elicited two interviews for local ABC radio stations; however one was cancelled by the producer on the day of the scheduled interview. In 2011, a second updated media release for 2011 was not supported by the Monash University Marketing Department. As a result the doctoral candidate of this study wrote and disseminated a media release for 2011 with pro bono assistance from an associate in the “communications” field. Margaret Gee's Media Guide was used to directly contact the editors of various media outlets. This guide is the

media industry's gold standard used to contact media outlets. This endeavour elicited contact from the editors of UltraFIT magazine and Women's Health and Fitness magazine and interest from The Preventative Health Journal, which resulted in the four publications in 2011 as outlined above.

5.2.1.3 Newspaper advertisements. In 2010, a newspaper advertisement was placed in the local Waverley Leader Newspaper, and free advertisement listings were placed in the local and surrounding area newspapers. In 2011, free advertisement options were continued and, in addition, the Monash University Advertising Department facilitated a free advertisement, known as a "Space Filler", to be placed in The Age newspaper (see Appendix H).

5.2.1.4 Interactive internet sources. In 2011, three interactive internet-based recruitment tools were introduced to bolster recruitment. They were:

- **Website:** A website, www.actingonweight.com, was developed to enhance recruitment. It included a mechanism for potential participants to enquire about the study via the website to facilitate more people to contact the doctoral candidate about joining the study (see Appendix I).
- **Facebook:** A Facebook page administered by the doctoral candidate was set-up to enhance recruitment.
- **Twitter:** The Monash University Marketing Department used Twitter twice to complement coverage of the research study received through the Women's Health magazine publication and The Preventative Health Journal publication.

5.2.1.5 Internet based public events lists, community notice boards and

newsletters. Before and during 2010 and 2011, the research was advertised through various internet-based event lists and community notice boards, each involving multiple listings over this time.

2010/2011

- Go for Your Life, Victoria Government, listed under Events (see Appendix J).
- Better Health Channel, Victorian Government, listed under Events.
- Australian Psychological Society, listed under Research Opportunities.
- Leader Newspaper, listed under Events.
- Various local councils, listed under Events e.g. City of Monash Community Noticeboard, and Yarra City Community Noticeboard.
- Infoxchange, listed under “Events”.
- Get Networking, listed under “Features”.
- Health News, listed under “News”.
- Monash University Monash Memo, weekly electronic newsletter.
- Monash University Well-being Newsletter, electronic newsletter.
- Monash University Faculty of Medicine Ebulletin, weekly electronic newsletter.

2011

- Australian Fitness Industry, listed under “Events”.
- Eventful.com, a website specifically designed to advertise events.
- Heart Foundation, listed under “Events”.
- Nutrition Australia, listed under “Events”.
- Gumtree, a free local classifieds site.

5.2.1.6 Internet-based public forums. Before and during 2010 and 2011, the research opportunity was advertised through various internet-based public forums.

2010/2011

- The Australian and New Zealand Acceptance and Commitment Therapy group forum.
- The Acceptance and Commitment Therapy public Yahoo forum.
- Melbourne Manics, a general community-based forum.
- Weightloss.com, a public forum about weight.

5.2.1.7 Commercial weight loss organisations. Well-known weight loss organisations based in Melbourne were contacted in an attempt to establish working relationships, specifically Weight Watchers International and Jenny Craig Inc. Various attempts were made to engage these organisations, including phone calls, emails and visits to state offices. However, these organisations showed little interest in the research, and although they stated that they would consider the opportunity, they did not ultimately support the research.

5.2.1.8 Direct mail. From very early 2010 to a third of the way through 2011 over 6,000 research information packs that consisted of a cover letter introducing the research and an A4 sized research poster were dispatched to various health related organisations listed in the Yellowpages on-line. The types of organisations that received the information were: medical clinics, doctors' surgeries, gyms, personal trainers, weight loss organisations, dieticians, nutritionists, and physiotherapists. Organisations that were located in the suburbs surrounding the location of the workshops venue were targeted.

5.2.1.9 Direct emails or phone calls. Major media coverage for the research was pursued by contacting the following organisations: (a) The Project on Channel Ten, (b) Radio Therapy on the TripleR Radio, (c) Dr Sally Cockburn on the 3AW Radio, (d) Lyndi Burn on

The Drive Program on local ABC Radio, (e) Mx commuter magazine, (f) The Age Newspaper, (g) The Herald Sun Newspaper, (h) Body and Soul Magazine of the Herald Sun. None of these avenues were successful.

5.2.1.10 *Direct contact with local councils.* The Human Resources departments of the following local councils were contacted to request information about the research opportunity be included in the staff newsletter: (a) Boroondara, (b) Glen Eira, (c) Kingston, (d) Knox, (e) Manningham, (f) Maroondah, (g) Monash, (h) Port Phillip, (i) Stonnington, Whitehorse, (j) Casey, (k) Frankston, (l) Dandenong, (m) Melbourne, (n) Yarra (o) Banyule. Most of these councils were open to promoting the research due to the health opportunity it provided to their staff. It is not known how many of the councils did actually promote the research, although it is known that Banyual, Port Phillip, Yarra City, and Whitehorse actively promoted it. The City of Whitehorse facilitated an information session where the research opportunity was presented to their staff.

5.2.1.11 *Professional presentations.* To promote the research the doctoral candidate of this research was available for professional presentation engagements about the research and its related theories. Two significant presentations were a professional development session for the Monash Medical Centre Dietetics Department 2011; and a presentation for the Australian Psychological Society's Health Psychologists Annual Dinner 2011.

5.2.1.12 *Recruitment posters placed in various locations.* Recruitment posters were included in the direct mail out of the 6000 research promotion packs sent out over 2011 and 2012. Posters were also put up around Monash University, Monash Medical Centre, and The Royal Melbourne Hospital. On one occasion smaller versions of the posters were distributed during a train station promotion at Flinders Street Station at peak hour.

5.2.1.13 Consultations with marketing and communications professionals at

Monash University. The various marketing and communications professionals within Monash University were consulted throughout 2010 and 2011 to ensure all avenues of advertising for participants had been tried. The professionals were mainly based within the Monash University Marketing Department. Discussions were held with the Director of Marketing and Communications for the Faculty of Medicine, Nursing and Health Sciences also.

5.2.1.14 Direct email contact made with various colleagues at Monash University

who work in the weight related field. To elicit support throughout Monash University and facilitate more participants, the following people, who work in the weight related field within Monash University, were contacted: (a) Associate Professor John Dixon from the Department of General Practice, Faculty of Medicine, Nursing and Health Sciences; (b) Ms Toni McGee from the Department of General Practice, Faculty of Medicine, Nursing and Health Sciences; (c) Ms Catherine Lombard from the School of Public Health and Preventive Medicine, Faculty of Medicine, Nursing and Health Sciences; (d) Dr Leah Brennan from the Centre for Obesity Research and Education and Faculty of Medicine, Nursing and Health Sciences; (e) Professor Iain Clarke from the Department of Physiology, Faculty of Medicine, Nursing and Health Sciences; (f) Professor Brian Oldfield from the Department of Physiology, Faculty of Medicine, Nursing and Health Sciences; (g) Professor Michael Cowley from the Department of Physiology, Faculty of Medicine, Nursing and Health Sciences; (h) Dr Kathryn Backholer from the Department of Epidemiology and Preventive Medicine, Faculty of Medicine, Nursing and Health Sciences.

5.3 Procedure

Approval for this research was granted by the Monash University Human Research Ethics Committee (MUHREC) in October 2009 (CF09/2473 - 2009001435) (see Appendix K).

5.3.1 Initial participant contact and eligibility criteria. After seeing advertisements or hearing about the research, potential participants voluntarily contacted the doctoral candidate of the research study via telephone or email. If email was the first contact made, then the doctoral candidate responded by telephone to the potential participant. During initial verbal contact with people who were interested in becoming participants for the study, a brief overview was given regarding what participating in the study would involve, including a brief premise of the research, the time commitment involved if they choose to participate, the location of the visits/appointments, a brief description of the aim of the 1-day ACTing on Weight group workshop, and the three face-to-face contact visits involved being 1) a face-to-face registration session; 2) the 1-day ACTing on Weight group workshop; and 3) a brief group follow-up session.

During the initial contact, eligibility criteria were also assessed. Eligibility criteria were BMI within the healthy weight range or above, participants who had lost at least 5% of their starting weight within the last 6 months, were aged over 18 years were not currently pregnant or recently given birth within the last year and were willing to voluntarily participate in the study. During the initial contact, self-report weight loss was used to determine the weight loss criteria. Participants were asked to report their starting weight and then their current weight before the 5% criteria was discussed. Where potential participants did not meet the 5% weight loss criteria they were asked if they could be called back in a few weeks so eligibility could be reassessed at a later stage. Most people agreed to this. If participants met the eligibility criteria, then they were given a registration session appointment time to register face-to-face for the study. It was explained that at the registration session their weight, height, and waistline would be measured by a Registered Nurse and that they would also be allocated to a 1-day ACTing on Weight group workshop date, as well as a group follow-up session date. It was also explained that participants would

not be able to choose which dates they were allocated to; however, a list of all the possible workshop dates they might be allocated to was given to them. If participants knew they would not be able to attend any of the dates scheduled they did not continue to the face-to-face registration session. After booking in a registration session time, participants were sent an information pack either via mail or email. This information pack included a formal explanatory statement about the research including MUHREC contact details, the date and time of their registration session, the location of the session, directions including a small map to the registration session, a list of the workshop dates they may be allocated to and a list of services they may wish to contact if they required support to deal with any uncomfortable thoughts or emotions related to the research (see Appendix L).

5.3.2 Registration session, participant de-identification and randomisation. At all registration sessions, participants were greeted by the doctoral candidate of the research study who reiterated what was required to participate in the study. At this time, any questions or concerns participants had were addressed. It was at this stage that participants signed their consent forms outlining their voluntary participation in the research study (see Appendix M). It was also at this time participants were given a unique research ID number that they were instructed to use throughout the study to de-identify their results. Participants were given their ID numbers on a small card to keep with them to be used at each stage of the research. After signing their consent forms and being allocated an ID number participants were directed to the Registered Nurse to get their weight, height and waistline measured, and also to be allocated to their research group category, that is, either the treatment group or the wait-list control group. The Registered Nurse who worked for the research study in a pro bono capacity was, at the time employed by Southern Health's Monash Medical Centre. At this point of the registration session, the nurse double checked that the consent form had been

signed, and that participants had received their unique ID number card. The nurse then conducted the first measurement assessment.

The assessment began by the nurse asking the participants for their self-report of weight and height. The objective measures were then taken by the nurse to ascertain the participant's weight, height, and waistline. The participant's unique ID number and all self-report and objective measurements were recorded on the Nurse Registration Form data sheet. This data sheet was a single A4 page with spaces for participant's unique ID number and the measurements reported at all time points (see Appendix N for an example of the Nurse Registration form). After the measurements were taken, the nurse proceeded to execute the randomisation allocation system that was set up prior to the beginning of the research which was designed to randomly allocate participants to either the treatment group or the wait-list control group. The randomisation system constituted a box of small envelopes coded with participant research ID numbers. Inside each of the envelopes was one piece of coloured paper, either blue or purple in colour. The colour indicated the research group the participant had been allocated to—either the treatment group or the wait-list control group. The nurse matched the participants ID card previously given to them by the doctoral candidate to the small envelope with the matching ID number, then opened the envelope and told the participant the colour they had received. The nurse also wrote the colour code on the back of the participants ID card and on the Nurse Registration Form data sheet. Despite executing the randomisation, the nurse was blind to the meaning of each colour, so was unaware of which group any of the participants were allocated to. Once the nurse had completed recording all measurements and the participant's colour code on the Nurse Registration Form, the participant's consent form was placed inside the small envelope with the relevant colour code; the envelope was sealed, dated and signed by the nurse who then placed the Nurse Registration Form data sheet aside for data entry, as it formed the beginning of each

participant's data collection. Once the nurse had completed the required tasks, the participant was directed back to the doctoral candidate. The doctoral candidate then requested to see the participant's ID card with the colour code written on the back. The colour code indicated the research group the participant had been allocated to, and also which 1-Day ACTing on Weight group workshop dates the participant was to attend.

5.3.3 1-day ACTing on Weight group workshop date allocation and data

collection points. Once each participant had been allocated to either the treatment or wait-list control group, the participant was invited to participate in the 1-day ACTing on Weight group workshop and group follow-up session that corresponded to their research group allocation. Another small information pack was given to each participant which included the date of their 1-day ACTing on Weight group workshop and details about the workshop day, including the need to bring a pre-packed lunch which formed part of one of the workshop activities. For people who were allocated to the treatment group this concluded their registration session. Conversely, participants who were allocated to the wait-list control group were further instructed to complete their first ACTing on Weight self-report questionnaire, which constituted their pre-treatment data, and their 1-day ACTing on Weight group workshop was booked for exactly three months after their registration session. When participants in the wait-list control group returned for their 1-day ACTing on Weight group workshop, they were greeted by the doctoral candidate and directed to the Registered Nurse to get weighted and measured again. They then received their second ACTing on Weight self-report questionnaire and completed it between 9am-10am before their workshop commenced at 10am. This questionnaire constituted their post-treatment data. They then attended the 1-day ACTing on Weight group workshop.

When participants in the treatment group arrived for their 1-day ACTing on Weight group workshop they were greeted by the doctoral candidate and directed to the Registered

Nurse to get weighed and measured again. They were then given their first ACTing on Weight self-report questionnaire and completed it between 9-10am before their workshop commenced at 10am, this constituted their pre-treatment data.

Participants in both groups attended a short follow-up session also, which was scheduled for exactly three months after each 1-day ACTing on Weight group workshop date. Participants in the treatment group were given their second ACTing on Weight self-report questionnaire before the beginning of this follow-up session and completed it between 9am-10am before the session commenced. This constituted the treatment group's post-treatment data. See Figure 2 for the flow chart of the procedure. See Appendix O for a copy of the ACTing on Weight Self-Report Questionnaire.

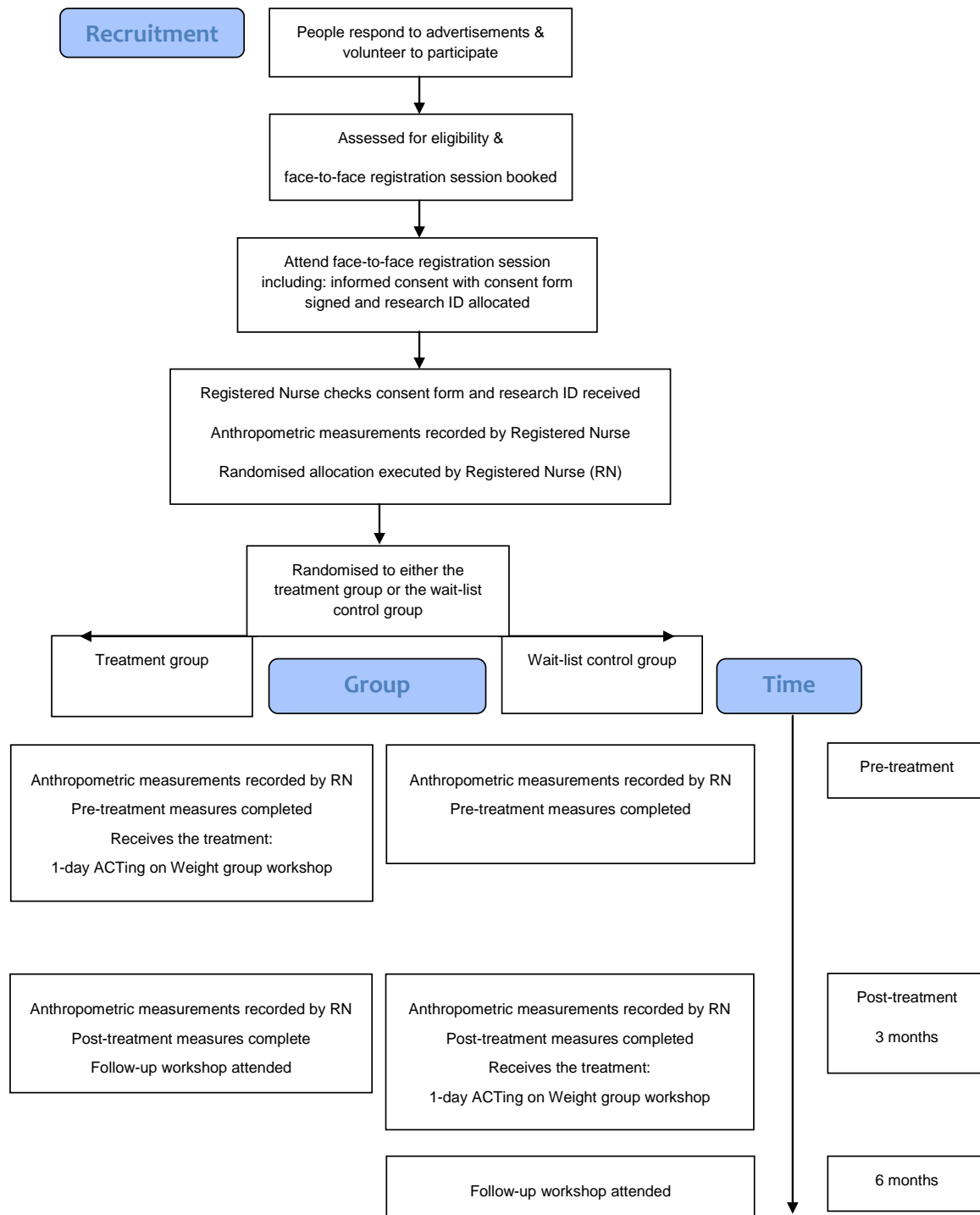


Figure 2. Flowchart for ACTing on Weight procedure.

5.3.4 Setting and materials. All face-to-face meetings including registration, the workshops and follow-up sessions were held at the Monash Psychology Centre, formerly known as the Clinical Psychology Centre, located within the Omnico Business Centre at Building 1, 270 Ferntree Gully Road Notting Hill, VIC, 3168. The weighing and measuring instruments used in this study were purchased specifically for the study. The scale, height rod and waistline measuring tape were purchased from Medshop Australia, a professional medical supplier. The scale used was the Charder Scales MS-3200 Professional Scale 300kg Capacity. Other materials needed to conduct the research constituted items used within the 1-day ACTing on Weight group workshop and included a Participant Handbook specifically designed for the workshop (see Appendix P), a computer and data projector to view mindfulness examples on YouTube, a stop watch, chocolate, sultanas and almonds for mindfulness eating exercises, and note pads and pens for participants to take notes. In addition tea, coffee, milk, and morning and afternoon tea food items were provided during scheduled breaks during the workshop. The food items provided included, fruit, muesli bars, and sweet biscuits or mini muffins. Participants were instructed to bring a packed meal for lunch consisting of something they would normally eat for lunch, to be used in an activity within the workshop. Additional lunch items were also available in case any participants forgot their lunch. These items included bread rolls, cheese, meat, and salad items.

5.3.5 1-day ACTing on Weight group workshop day procedure. Participants were asked to arrive at 9am on the day of their 1-day ACTing on Weight group workshop. All workshops were held on Saturdays. All participants were greeted by the doctoral candidate who checked that each participant had their unique research ID number available before they were directed to the Registered Nurse to be weighed and measured. The nurse recorded the participant's ID number along with results of the measurements on the Nurse Registration Form data sheet. Participants were then directed back to the doctoral candidate

who instructed them to complete their ACTing on Weight self-report questionnaire. The time taken for participants to complete the questionnaire ranged from 20-40 minutes. When participants finished their questionnaire they were directed to the communal kitchen within the building where tea and coffee were offered while other participants completed their questionnaires. Each of the 1-day ACTing on Weight group workshops commenced at approximately 10am, after each participant had completed his or her self-report questionnaire. The workshops, except for the first, were facilitated solely by the doctoral candidate. The first workshop was co-facilitated with one of the research supervisors, Dr. Cate Bearsley-Smith, as a quality control measure. The co-facilitator is a researcher and clinical psychologist with experience and expertise in the delivery of mindfulness-based interventions, who focused on ensuring that the workshop materials were provided competently. Dr Bearsley-Smith was also available and provided ongoing consultation to the doctoral candidate regarding the delivery of the workshops throughout data collection.

On the day of the workshop, three breaks were usually taken; one for morning tea, one for lunch, and one for afternoon tea. If the facilitator noticed that another short break would be beneficial, then the group participants were asked if they would like an additional break. The average time participants were present for the 1-day ACTing on Weight group workshop was 7.25 hours where approximately 5 hours were spent engaged in the didactic and experiential aspects of the workshop material; 1 hour constituted questionnaire completion and approximately 1.25 hours constituted breaks. The procedure for the follow-up sessions mirrored the 1-day ACTing on Weight group workshop day procedure; however the session was scheduled to conclude at 11am and usually finished between 10.30am and 11am.

5.3.6 The 1-day ACTing on Weight group workshop treatment protocol. Below is a brief outline of the content contained within the 1-day ACTing on Weight group workshop treatment protocol, see Appendix Q for a copy of the complete protocol. Following this the measures used in the study are outlined.

5.3.6.1 The ACTing on Weight treatment intervention protocol summary

- Welcome
 - About the Workshop
 - Informed consent: Experiential nature of the workshop
 - Participant self introduction
- Brief overview of workshop aims
 - Participant Workbook provided, with the Workshop Handouts
- What is the aim of ACT
- Present Awareness: Setting the Scene
 - *Mindfulness exercise: ACT in a Nutshell* (Harris, 2008)
- Struggles and Suffering
 - Radio doom and gloom: Emotional Eating and Weight
- Emotional Eating and Weight: Open discussion
 - Facilitator drawing out experiential avoidance and cognitive fusion in conversation, recording on whiteboard.
- Life Draining Actions
 - *Worksheet: Individuals clarifying and documenting things that keep them stuck, experiential avoidance and cognitive fusion.*
- Living The Life You Want, & Values
 - *Worksheet: If Emotional Eating and Weight were not such a problem...*
 - What are values
 - *Metaphor Reading: The Compass* (Harris, 2009, p. 192)
 - *Worksheet: Individual clarifying and documenting their values*

Morning Tea Break

- Control is The Problem
 - Trying to control feelings and thoughts is the problem
 - Emotional eating is a control strategy
 - *Metaphor Reading: The Problem Solving Machine* (Harris, 2009, p. 23)
 - Adaptation of Clean v Dirty Pain: Pain A vs. Pain B (Hayes et al., 1999)
 - *Metaphor Reading: Struggling in Quicksand* (Harris, 2009, p. 92)
 - The intuitive nature of struggle and problem solving
- Language and The Mind
 - The Upside and the Downside of Language
 - Mind Stories
 - Does trying to get rid of thoughts and feelings work?
 - *Metaphor Reading x 3: Delete a Memory & The Polygraph* (Harris, 2009, p.94); *Don't Think About Chocolate Cake* (Hayes et al., 1999, p. 124)
- Letting go of the Control Agenda
 - *Metaphor: Demons on the Boat* (read or play YouTube clip) (Harris, 2009, p. 148)
- The ACT option Summarised
 - New skills
 - *Mindfulness Exercise: Mindfully Eating a Raisin*
 - *Mindfulness Exercise: Mindfully Eating Lunch*

Lunch Break

- Working with Painful and Persistent Thoughts
 - *Experiential Exercise: Thoughts on a Card* (Harris, 2009, p.104)
 - Cognitive Fusion demonstrated and explained
 - Workability, and Fusion verses Believability
 - *Reading: Naomi's Story* (Harris, 2009, p. 130)
 - *Experiential Exercise: Name Your Story*
- Cognitive Defusion
 - *Experiential Exercise: I am having the thought that...* (Harris, 2009, p. 109)
 - *Mindfulness Exercise: Leaves on a Stream* (Harris, 2009, p. 113)
 - Thoughts influence but do not control actions

- Willingness
 - *Metaphor*: Brian, 'The Unwanted Party Guest' (play YouTube clip, author Joe Oliver). An adaptation of Joe the Bum (Hayes et al., 1999, p. 240)
 - *Metaphor Reading*: The Struggle Switch (Harris, 2009, p. 149)
 - *Mindfulness Exercise*: Acceptance of Emotion (Harris, 2009, 137)
 - *Metaphor*: Demons on the Boat, re-introduce here for consolidation
 - *Short Mindfulness Exercises*: The Curious Scientist (Harris, 2009, p. 146); Allowing (Harris, 2009, p. 146); Breathe Into It (Harris, 2009, p. 146)
- Workable and Unworkable Actions
 - Eating chocolate is workable, eating a block of chocolate after dinner is not
 - Mindful/Mindless; Valued/Fused; Willing/Avoidant; Effective/Ineffective
 - *Mindfulness Exercise*: Mindfully eating luxury chocolate (i.e. Lindt)
- Mindfulness
 - What is mindfulness, and what is it within an ACT context
 - *Mindfulness Exercise*: Notice X (Harris, 2009)
- Observing Self and Thinking Self
 - The part of the mind that notices
 - *Metaphor Reading*: The Sky and Weather (Harris, 2009, 175)
- Values and Committed Action
 - *Experiential Exercise*: Write Yourself a Letter from the Future (Shepherd, 2009)
 - Setting values based goals
 - *Worksheets*: From F.E.A.R to D.A.R.E adapted from Harris (2009).
- Conclusion
 - ACT summary verbal and handouts: Participant Handbook provided
 - Answer any outstanding questions
- Thank you
 - Participants, and authors of resources

5.3.7 Development of the 1-day ACTing on Weight group workshop treatment

protocol. The ACTing on Weight group workshop treatment protocol was adapted from the treatment intervention used in Lillis et al. (2009) that they called Obesity Stigma and Weight Management Acceptance and Commitment Therapy Treatment Manual. Permission to use this original work was granted by Jason Lillis. Russ Harris also granted permission to use his published materials like worksheets and exercises if it was for non-for profit research purposes. The specific works that were relied upon heavily in the development of the protocol were Hayes et al. (1999), Hayes and Smith (2005), and Harris (2009). See Appendix R for a copy of the email from Russ Harris granting permission to use his materials. Over and above The ACTing on Weight group workshop treatment protocol, a Participant Workbook with Workshop Handouts was produced for participants to use during the workshop, see Appendix S.

5.4 Measures

In this study measures were chosen for the main purpose of measuring emotional eating, experiential avoidance and cognitive fusion in the context of weight loss maintenance. Additional subsidiary measures including subjective well-being measures were also included as they have been observed to be a general omission from the previous weight loss maintenance research.

5.4.1 Emotional eating scales. Three emotional eating scales were used in this study.

Emotion and Stress Related Eating Scale (ESRE) of the Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire (Ozier, et al. 2007). The ESRE was designed to assess *how* individuals use food to cope with stress and emotion. It was developed in the context that food as used as a coping mechanism or a maladaptive coping strategy impacts the current obesity epidemic. Although at the time the EADES was developed other measures

of emotional eating existed, the EADES authors were the first to attempt to develop and test a theory-based questionnaire that assesses how individuals cope using food. The development of the scale was informed by the Transactional Model of Stress and Coping theory which is widely understood in the health literature, and used by health professionals, to understand and improve coping and adaptation for health related issues (Ozier et al., 2007, p. 620). The scale was developed to reflect the findings that show “eating has been recognised as a coping mechanism for alleviating and dealing with stress and emotions” and that this can impact weight management (Ozier, et al., 2007, p. 619). The ESRE sub-scale of the EADES encompasses questions “that identify eating as a result of an emotion or stressor representing a coping effort” i.e. eating as a coping strategy (Ozier et al., 2007, p. 624). The EADES is a self-report measure that consists of 49 statements; the ESRE subscale consists of 24 statements relating to eating behaviour with situations and emotions, for example, “I eat to avoid dealing with problems”. Participants are instructed to indicate their level of agreement or disagreement with each statement on a 5-point Likert scale anchored by *1 = strongly disagree* and *5 = strongly agree*. Before a total score is calculated 15 items are reverse scored and then a total score is elicited by summing the 24 responses. Lower scores indicate more eating in response to emotions (Ozier et al., 2007). The full EADES reports mixed results for internal consistency with Cronbach’s alpha ranging from inadequate .65 to adequate .95. However, the ESRE subscale has been reported as more internally consistent than the full EADES with Cronbach’s alphas .95. The ESRE has not been widely reported in publications, which may be due to its relatively recent development. The two studies conducted by Ozier et al. (2007 & 2008), developing and validating the scale, are robust and confirm emotional eating and overweight and obesity are related. Ozier et al. (2008) found that “individuals who eat in response to emotions and stress are more likely to be overweight or obese” (p. 54) and individuals scoring the highest levels of emotional eating on the ESRE were 13.38 times

more likely to be overweight or obese than those who reported low levels of emotional eating. Cronbach's alpha using the current data set is 0.89.

The Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire (DEBQEE: van Strien et al., 1986). The DEBQEE was designed to assess eating in response to emotion. The DEBQEE is part of the full 33-item Dutch Eating Behaviour Questionnaire (DEBQ) and is a self-report scale. The DEBQ is the most widely used measure of eating behaviour with its popularity within the empirical literature evidenced by the 822 direct citations recorded on the Scopus database as at December 2013. The DEBQEE subscale consists of 13 questions relating to eating and emotions; for example, "Do you have the desire to eat when you are feeling lonely?" Participants are instructed to indicate how frequently they have the desire to eat for each question on a 5-point Likert scale anchored by *1 = never* and *5 = very often*, with a sixth option of *6 = not relevant*. A response of 6 is coded as 1 which is equal to 1 = Never. A total score is elicited by summing the responses and dividing it by 13 which is the number of items. Higher scores indicate greater emotional eating (van Strien et al., 1986). The DEBQ reports good to excellent psychometric properties. In the original paper the DEBQEE subscale was reported as achieving excellent internal consistency with Cronbach's alphas of .94, .95 and .94 respectively for the overall sample and the subsamples of obese and non-obese participants. A number of recent studies have also reported good to excellent psychometric properties of the DEBQEE of above .7 for Cronbach's alphas (Evers et al., 2010; Spoor et al., 2007; Tapper et al., 2009; Teixeira et al., 2010). Cronbach's alpha using the current data set is 0.86.

The Emotional Eating Scale (EES: Arnow et al., 1995). The Emotional Eating Scale measures eating in the context of three distinct emotions and consists of three independent subscales which include: anger/frustration (EESAnF); anxiety (EESAnx) and depression (EESDep) (Arnow et al., 1995). The ESS is a well known emotional eating scale with the

original scale being referenced directly on the Scopus database 194 times as of December 2013. The EES consists of 25 items. Respondents are asked to indicate the extent to which 25 different feelings lead them to feel an urge to eat by checking a response from the following: *no desire to eat, a small desire to eat; a moderate desire to eat, a strong desire to eat and an overwhelming urge to eat*. These responses are scored from 1-5 respectively. Total scores are tallied for each of EESAnF, EESAnx, and EESDep, with higher scores indicating greater emotional eating (Arnow et al., 1995). The EES subscales are reported to be internally consistent. In the original paper describing the development of the subscales, Cronbach's alphas for EESAnF, EESAnx and EESDep respectively were .78, .78, and .72. It is noteworthy that part of the reason Arnow et al. (1995) developed the EES is because other scales available at the time, including the above mentioned DEBQ (van Strien et al., 1986), did not permit the distinction between specific mood states. It is important to note that the EES was developed to "permit a more detailed analysis of the relationship between negative mood and disordered eating" and was developed with participants who were obese (Arnow et al., 1995, p. 81). In response to this, Waller and Osman (1998) assessed the validity of the EES with participants classified as nonclinical, meaning people with no history of disordered eating and having a BMI within the healthy range. Also, with this sample the scale was found to have good internal consistency with Cronbach's alphas for EESAnF, EESAnx and EESDep reported as .87, .84, and .80 respectively. More recently, the EES was used in a study ($N = 438$) reporting similar results; that is, Cronbach's alphas for EESAnF, EESAnx and EESDep were .88, .79, and .81, respectively (Ricca, et al., 2009). Cronbach's alphas using the current data set for EESAnF, EESAnx and EESDep respectively were .86, .80, and .61. The latter coefficient is inadequate and is discussed in section 6.3.2.

5.4.2 ACT specific scales of experiential avoidance and cognitive fusion. Three measures were used to capture ACT specific data.

Acceptance and Action Questionnaire II (AAQII: Bond et al., 2011). As highlighted in Chapter Four, the AAQII “is the most widely used measure of experiential avoidance and psychological inflexibility” (Bond et al., 2011, p. 3). The original Acceptance and Action Questionnaire (AAQ) version was published in 2004 and it was subsequently reduced to seven items in 2011 and is now referred to as the AAQII (Bond et al., 2011, p. 3). The AAQII was developed in order to establish an internally consistent measure of ACT’s model of mental health and behavioural effectiveness, and it is a one-factor measure of experiential avoidance or psychological inflexibility (ACBS, 2013; Bond et al., 2011). Instructions on the AAQII ask participants to rate how true each statement is on a 7-point Likert scale from *1 = Never True* to *7 = Always true*. An example of one of the statements is, “Worries get in the way of my success”. The total score is elicited by summing the raw scores. The authors report satisfactory psychometric properties for this scale with results extracted from six samples with a total $N = 2816$. The mean alpha coefficient is 0.84 and the “3-month and 12-month test-retest reliability is 0.81 and 0.79 respectively” (ACBS, 2013). The AAQ has been cited 425 times and the AAQII has been cited directly 72 times on the Scopus database as at September 2013. Cronbach’s alpha using the current data set was .88.

Acceptance and Action Questionnaire for Weight Related Difficulties (AAQW: Lillis & Hayes, 2008). The AAQW was designed to measure experiential avoidance and psychological inflexibility in relation to difficult weight related feelings, thoughts and actions (Lillis & Hayes, 2008). Over time it is emerging that the general experiential avoidance scale, the AAQII as described above, maybe too broad a measure to capture specific problematic content in the context of targeted ACT treatment protocols. In response a number of content specific scales have been designed and the AAQW is one of these. Another example of a

specific AAQ is the Acceptance and Action Questionnaire for Substance Abuse (AAQSA) which also shows better specificity (Luoma, Drake, Kohenberg, & Hayes, 2011). The content of the AAQW related specifically to difficult weight related thoughts and feelings; for example, “When I have negative feelings, I use food to make myself feel better”. There are 22 statements and participants are asked to rate the truth of each statement as it applies to them on a 7-point Likert scale from *1 = Never True* to *7 = Always true*. Before a total score is calculated 5 responses need to be reverse scored before the scores are summed. It reports satisfactory internal consistency in the original paper with Cronbach’s alpha reported as 0.88 (Lillis & Hayes, 2008), a recent citing reports an alpha of 0.86 (Weineland, Lillis & Dahl, 2013). Cronbach’s alpha using the current data set was 0.91.

Cognitive Fusion Questionnaire 28 item version (CFQ28: D. Gillanders, personal communication, June 2009). The CFQ28 was designed to assess cognitive fusion as defined within the ACT model as described in detail in Chapter Four. This scale was developed because at the time of construction there was no specific measure of this construct that could be used that can be adequately applied to the ACT model in the context of empirical research. At the time that the ACTing on Weight project was designed and ethics approval was granted, the authors of this scale advised that the 28-item version should be used, as the shorter 13-item version was yet to be validated (D. Gillanders, personal communication, June 2009). In January 2014 a 7-item version was published (Gillanders et al., 2014). As such the 28-item version was used in ACTing on Weight analyses. Respondents are asked to rate 28 statements with regard to how true they are for them on a scale from 1-7: *1 = never true*; *2 = very seldom true*; *3 = seldom true*; *4 = sometimes true*; *5 = frequently true*; *6 = almost true*; and *7 = always true*. The scale can be scored to reflect either fusion or defusion, with care to be taken to reverse score items depending on the chosen direction. In this study scores reflect cognitive fusion, with higher scores reflecting higher cognitive fusion scores. The items that

were reversed scored were items 3, 6, 9, 18, 19, 20, 21, 23, and 24. Cronbach's alphas for the CFQ28 is purported to be .86. Face validity was a consideration in choosing to use this scale, as was knowledge about the author's involvement in the construction of other ACT related measures such as the AAQII and general involvement in empirical research and publications within the ACT literature (e.g. Bond et al., 2011). Cronbach's alpha using the current data was 0.94.

5.4.3 Health and subjective well-being scales. Four scales were employed to capture information about health and subjective well-being.

The Satisfaction with Life Scale (SWLS: Diener, Emmons, Larsen, & Griffin, 1985). The SWLS purports to measure "global life satisfaction" based on a cognitive judgement and "does not tap related constructs such as positive affect" which are based on emotion (Diener et al., 1985). The SWLS is traditionally used in research exploring subjective well-being or happiness, where subjective well-being is usually separated into three components, including life satisfaction, and positive affect and negative affect (Diener et al., 1985). The SWLS is a widely used and respected measure which is evidenced by its 4197 direct citings recorded in the Scopus database as at December 2013. The SWLS is a self-report measure that consists of five brief statements for example, "In most ways my life is close to my ideal". Participants are instructed to indicate their level of agreement or disagreement with each statement on a 7-point Likert scale anchored by 1 = *Strongly Disagree* and 7 = *Strongly Agree*. A total score is computed by summing the five responses. Higher scores indicate greater satisfaction with life (Diener et al., 1985). Scores of 20 represent a neutral point on the scale and most groups fall in the range of 23-28, which indicates reporting one's satisfaction with life as slightly satisfied to satisfied (Pavot & Diener, 1993). The SWLS reports satisfactory to good psychometric properties with the original Cronbach's alpha reported as .87, and a mean

Cronbach's alpha of .78 derived from 62 studies (Diener et al., 1985; Vassar, 2008).

Cronbach's alpha using the current data set was .89.

The Positive and Negative Affect Scale (PANAS) (Watson et al., 1988). The PANAS was designed to measure positive affect (PA) and negative affect (NA) and has been found to be a reliable measure for these constructs, with both dimensions possessing high internal consistency. Cronbach's alphas were .88 and .87 respectively (Watson et al., 1988). Others have also found both dimensions to be reliable (Crawford & Henry, 2004). The PANAS is a widely used measure in a broad range of research areas as evidenced by the 8689 citations as recorded on Scopus as at December 2013. The PANAS is a self-report measure consisting of 20 words that describe two different affect states, 10 positive and 10 negative, for example *excited* and *upset*. The words listed are said to represent a broad sample of positive and negative affect with the scale eliciting two subscale totals, positive affect (PA) and negative affect (NA). Participants are instructed to indicate to what extent they generally feel each affect listed using a 5-point Likert scale anchored by *1 = very slightly* and *5 = extremely*. Separate NA and PA scores are calculated by summing the responses for the 10 words associated with each subscale. Higher scores on each affect dimension indicate participants feel more of that affect. Usually participants report more PA than NA (Watson et al., 1988). Recently, Leue and Lange (2011) published a meta-analysis of the internal consistency coefficients of the PANAS which included 147 data sets that recorded reliability scores of the PA and NA subscales. They reported "moderate to high internal consistency coefficients" for various versions of the PANAS over a broad range of populations. Specifically they found that the mean Cronbach's alpha for adults ranged from .85 to .89 for PA and .81 to .86 for NA (Leue & Lange, 2011, p. 493). Cronbach's alphas using the current data set for PA and NA were 0.90 and 0.87 respectively.

The General Health Questionnaire – 12 (GHQ12) (GL Assessment). The General Health Questionnaire (Goldberg & Williams, 1988) is a measure designed for use in identifying minor “psychiatric disorder in the general population and within community or non-psychiatric clinical settings such as primary care or general medical out-patients” (GL Assessment). The GHQ12 is the shortened version consisting of 12 items taken from the original 60-item GHQ. Despite not being publicly available, the GHQ12 is a well known and extensively used measure. The GHQ12 is a self-report measure that consists of 12 questions, for example “Have you been able to enjoy your normal day-to-day activities?” Participants are instructed to respond to each question indicating the extent to which they have experienced a particular symptom or behaviour recently, choosing from four options for each question (e.g. “more so than usual; same as usual; less so than usual; much less than usual”). There are four methods for scoring the GHQ12. Here Likert scoring was used on a 4-point scale (0-1-2-3) where the 12 scores were summed to produce a total score. Higher scores indicate more mental illness with lower scores indicating less psychological distress or greater mental health (GL Assessment). The GHQ has been associated with good reliability and validity (Goldberg et al., 1997). Where Goldberg et al. (1997) reviewed 17 publications with regards to the psychometric properties of the GHQ12, Cronbach’s alpha was reported to be between .82 and .86. Cronbach’s alpha using the current data set was 0.90.

Obesity Related Well-being Questionnaire (ORWELL) (Mannucci et al., 1999). The ORWELL was designed to measure obesity related quality of life, and takes into consideration the intensity and subjective experience of physical and psychological distress (Mannucci et al., 1999). The ORWELL has been directly cited 78 times as recorded by the Scopus database as at April 2012. The ORWELL is a self-report measure that consists of 18 two-part questions that tap the relevance or importance of a life domain and occurrence or severity of a symptom for the individual. Questions include “How important is it for you to

exercise regularly” and “Is your weight an obstacle for your physical activity?” Participants are instructed to indicate their level of agreement or disagreement with each question on a 4-point Likert scale; not at all/never, just a little/occasionally, not so much/sometimes, and much/often. A total score is computed by summing the 36 responses. Higher scores indicate lower obesity related quality of life (Mannucci et al., 1999). The original ORWELL publication reported good psychometric properties. Cronbach’s alpha was reported as .83 (Mannucci et al., 1999). Cronbach’s alpha using the current data set was 0.94.

5.4.4 Anthropometric measurements. *Weight, Height and Waistline.* Non-invasive quantitative techniques were used to measure participant’s weight, height and waistline measurements, and BMI was calculated using the weight and height measurements. All these measurements were taken by a Registered Nurse registered with the Australian Health Practitioner Regulation Agency. Weight was measured without footwear and participants were asked to wear similar clothing at each contact point. BMI was calculated using the height and weight measurements and was calculated by dividing weight by height squared.

5.4.5 Summary of data collection points. In summary, each participant was weighed and measured at their registration session. Participants in the treatment group were weighed and measured and completed their pre-treatment ACTing on Weight self-report questionnaire on the morning of their 1-day ACTing on Weight group workshop before the workshop commenced. These participants then returned to their follow-up session three months later, where they were weighed, measured and completed their post-treatment ACTing on Weight self-report questionnaire. Participants in the wait-list control group, in addition to being weighed and measured at their registration session also completed their pre-treatment ACTing on Weight self report questionnaire. Then three months later they returned for their 1-day ACTing on Weight group workshop and before it commenced they were weighed and measured and completed their post ACTing on Weight self-report questionnaire.

Wait-list control group participants also attended a follow-up session so they received as much information as the treatment group. The data collected is outlined in Table 1.

*Table 1**Measures Data Assessment*

Measures	Pre	Post
Emotional Eating		
DEBQEE	✓	✓
ESRE	✓	✓
EES	✓	✓
Experiential Avoidance		
AAQII	✓	✓
AAQW	✓	✓
Cognitive Fusion		
CFQ28	✓	✓
Health and subjective well-being		
GHQ12	✓	✓
ORWELL	✓	✓
SWLS	✓	✓
PANAS	✓	✓
Weight	✓	✓
Waistline	✓	✓
BMI	✓	✓
Height	✓	

Note: DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; EES = Emotional Eating Scale; AAQII = Acceptance and Action Questionnaire II; AAQW = Acceptance and Action Questionnaire for Weight; CFQ28 = Cognitive Fusion Questionnaire 28; GHQ12 = General Health Questionnaire-12; SWLS = Satisfaction with Life Scale; ORWELL = Obesity related Well-being Questionnaire; PANAS = Positive Affect and Negative Affect Scale; BMI = Body Mass Index.

5.5 Data Analysis Preparation and Plan of Statistical Analyses

To empirically answer the specific research questions and hypotheses generated the following data analysis preparation was conducted and statistical analyses plan followed.

5.5.1 Data analysis preparation. Data from the paper-based self-report questionnaires and the various Nurse Registration Form data sheets were put into the computer-based statistical software package IBM SPSS (Statistical Package for the Social Sciences) Version 19.0 during 2012 and Version 21.0 during 2013. This constituted the raw data set which was then exported to the computer-based software program Microsoft Office Excel 2007 and the data was re-entered to approximate a ‘double entry’ check of the raw data. Discrepancies in the data were then explored and addressed with the SPSS version of the raw data updated to constitute the final raw data set. The double entry was conducted due

to the relatively small sample size ($n = 99$) and the desire to reduce any possible data entry errors before the statistical analysis commenced. Other data cleaning measures were employed, such as conducting SPSS descriptive statistic analyses to ensure that data values were within expected ranges.

5.5.2 Missing values analysis. With regards to the study's variables of major interest as measured by the 10 standardised questionnaires, missing values analysis through SPSS was employed to identify how many cases had missing values for each of the 384 individual variable data points that ultimately constitute the measure total scores. Overall, minimal data was missing which is outlined in Table 2 below, and appeared to be randomly distributed and within the conventional 5% range, thus presenting no threat to the integrity of the data (Tabachnick & Fidell, 2001). Where individual participants had missing data of 5% on any one scale a total score for that scale was not calculated and they were excluded from analysis involving that scale. Thus, pair-wise deletion during analysis was employed. Where a non-significant amount of data was missing on any one scale for an individual participant the method of 'mean substitution' was employed for each variable, with the method of 'group mean substitution' employed for variables measured post the treatment (Tabachnick & Fidell, 2001, p. 62).

Table 2

Percentage of Missing Data for Each Scale Prior to Replacement of Missing Values

Scale	Time Pre or Post	% of missing data
<i>Emotional Eating (EE)</i>		
The Emotional and Stress Related Eating subscale (ESRE) of	Pre	0.51%
The Eating and Appraisal Due to Emotions & Stress (EADES)	Post	0.56%
The Emotional Eating subscale (DEBQEE) of	Pre	0.08%
The Dutch Eating Behaviour Questionnaire (DEBQ)	Post	0.00%
The Emotional Eating Scale subscales (EES)	Pre	0.85%
	Post	0.53%
<i>Experiential Avoidance (EA)</i>		
Acceptance and Action Questionnaire for Weight (AAQW)	Pre	0.73%
	Post	0.23%
Acceptance and Action Questionnaire version II (AAQII)	Pre	0.00%
	Post	0.24%
<i>Cognitive Fusion (CF)</i>		
Cognitive Fusion Questionnaire-28 (CFQ28)	Pre	0.14%
	Post	0.06%
<i>Health and Subjective Well-being</i>		
Satisfaction with Life Scale (SWLS)	Pre	0.00%
	Post	0.00%
Positive & Negative Affect Scale (PANAS)	Pre	0.00%
	Post	0.08%
The General Health Questionnaire-12 (GHQ12)	Pre	0.42%
	Post	0.69%
Obesity Related Well-being Questionnaire (ORWELL)	Pre	0.45%
	Post	0.32%

Despite there being minimal missing data overall there were four individual variables, constituting 1.2% of the total data set, that had missing data above the conventionally accepted 5% range, and thus warranted exploration before methods of estimates of missing data were considered and employed.

The first and second anomalies involved the same variable, or question, on both the pre and post-treatment questionnaire. It was question 12b of the ORWELL. The question was “12b: If this happens does it worsen your mood”. The “If this happens” is referring to the previous question which is 12a “Do others ever tease you about your weight?”. On

investigation it was discovered that all the participants who did not provide a response for question 12b on the ORWELL had responded “never” to previous question 12a. The response options for question 12b were “not at all, just a little, not so much, much”. The “never” to question 12a is scored as “0” adding nothing to the overall total score of the ORWELL, where higher scores indicated greater distress and lower quality of life. Reason, together with the missing data method of ‘prior knowledge’ (Tabachnick & Fidell, 2001) resulted in a decision being made that those who answered “Never” with a score of “0” for question 12a would have their 12b answer imputed as a score of “0” also.

The third anomaly involved the first question of the AAQW on the pre-treatment questionnaire. On investigation it was discovered that this scale’s instructions start close to the bottom of the page and the first question is shaded gray after the instructions. It appears that this question has been accidentally missed by participants due to poor design/layout of the questionnaire as opposed to a deliberate ignoring of the question. The drawing of this conclusion was contributed by the fact that little to no missing data on the remainder of the scale was present. The question was missed by $n = 8$ (8.1%). It was decided that, even though this figure constituted greater than 5%, given the plausible reason for the missing values, mean substitution would be an appropriate method to use in addressing the missing data on this question. This is also in the context of only 1.2% of the entire dataset having more than 5% missing data.

The fourth anomaly was that four participants (6.7%) did not respond to the first question of the GHQ12 in the post-treatment questionnaire. On investigation no compelling reason could be found as to why this missing data had occurred. Given that there was only one other piece of missing data for the entire data set on this scale, constituting 0.69% of the total scale sample, and that it is a univariate scale, it was decided that mean substitution would be an appropriate method to address the missing data.

5.5.3 Sample size and attrition. Of the 376 (female = 354, male = 22) people who responded to the “ACTing on Weight” advertisements expressing interest in participating in the research $n = 111$ attended a face-to-face registration session. Of these $n = 54$ (53 = female; 1 = male) were randomly allocated to the treatment group, and $n = 57$ (54 = female; 3 = male) were randomly allocated to the wait-list control group. The pre-treatment measures were completed by $n = 43$ (42 = female; 1 = male) and $n = 56$ (54 = female; 2 = male) for the treatment and wait-list control groups respectively, and the post-treatment measures were completed by $n = 28$ (28 = female) and $n = 32$ (32 = female) for the treatment and wait-list control groups respectively. In total $n = 99$ (96 = female, 3 = male) completed the pre-measures and $n = 60$ (60 = female) completed both the pre and post-measures. The flow chart in Figure 3 outlines sample size at the various stages of the research as well as attrition, and attrition reasons. During 2010 and 2011, fourteen 1-day ACT group workshops were conducted; the mean number of participants in the workshop groups was $n = 6$. The anticipated number of participants per workshop was $n = 10$.

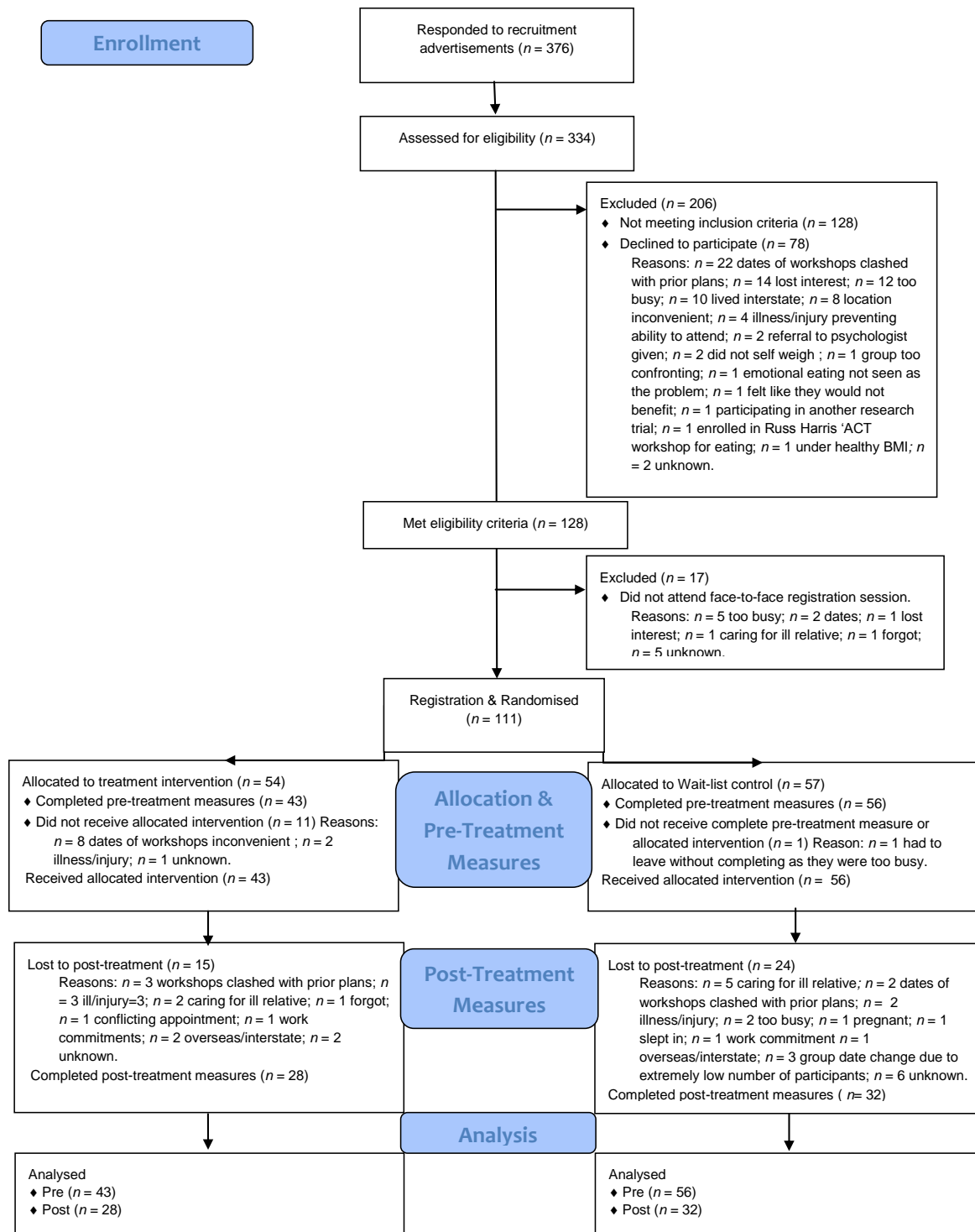


Figure 3. CONSORT flowchart for ACTing on Weight participant numbers.

Note. CONSORT = Consolidated Standards of Reporting Trials.

5.5.4 Statistical assumptions. Prior to the commencement of any data analysis, the data was screened for any violations of the assumptions of multivariate analysis. Where appropriate, and for each analysis conducted, the following assumptions were reviewed. Univariate and multivariate normality were assessed using histograms, normal Q-Q plots, detrended Normal Q-Q Plots, kolmogorov-smirnov values, and mahalanobis distances. Outliers were assessed using Box Plots, Means and Trimmed Means and extreme values scores. Homogeneity of variance was assessed using Levene's Test. Homogeneity of covariance was assessed using Box's M. Linearity was assessed using Scatter Plots. Multicollinearity and singularity were assessed using bivariate correlations.

5.6 Plan of Statistical Analyses

The results section has been separated into five subsets of results based on the plan detailed below to guide the reader through how the results refer to, and answer, the research questions and hypotheses.

5.6.1 Sample characteristics. The first subset of results describes the data, particularly the participant sample, before specific research questions are answered using inferential statistics (Howell, 2002; Pallant, 2005). The sample characteristics constitute descriptive statistics that were extracted using SPSS. More specifically, the descriptive statistics presented in this section include participant demographic and socio-economic characteristics as well as participant weight related characteristics. At the end of this section, differences between the treatment group and the wait-list control group were examined for pre-existing differences at baseline and prior to the treatment. A chi-square test for independence was used to identify any significant differences between the treatment group and the wait-list control group on a selection of participant characteristics at baseline. A chi-square test for independence was used because the demographic and socio-economic sample characteristics constitute categorical data and the sample was split into two groups, also

creating categories. The chi-square test for independence “compares the frequency of cases found in categories of one variable across the different categories of another variable” (Pallant, 2005, p. 287). Thus, the chi-square test for independence was employed to illuminate any significant differences between the two groups across various sample characteristics categories before the treatment phase. Despite the chi-square being a non-parametric statistic, and thus more robust to violations of general statistical assumptions, when interpreting chi-square results attention must be paid to the lowest expected frequency of cases within each cell, which should be at least 5. If this assumption is violated in a 1 by 2 or 2 by 2 table it is advisable to instead interpret the Fisher’s Exact Probability Test (Pallant, 2005). Where violations of lowest expected frequencies occurred Fisher’s Exact Probability has been reported instead of the standard chi-square result.

The last table (Table 49) contained in this first subset of results reports descriptive statistics for anthropometric measurements and other weight related variables recorded at the registration stage. The table reports, also, the results of t-tests which were conducted to illuminate any pre-existing differences between the treatment and wait-list control group at the registration stage. The independent measures t-statistic, or t-test, was chosen here because it compares the means of two groups and ascertains if the mean difference between the groups is statistically significant (Gravetter & Wallnau, 2004). Using t-tests at this stage means that any pre-existing differences are most likely to be elucidated.

5.6.2 Pre-treatment data for the main standardised variables of interest and anthropometric measurements at Time 1. The second subset of results has two main purposes. Firstly, it is dedicated to outlining and describing the pre-treatment data at Time 1. Secondly, it is dedicated to exploring the pre-treatment data specifically in terms of elucidating any pre-existing differences between the treatment group and the wait-list control group. This is vital because if pre-existing differences between the two groups do exist before the treatment phase these differences need to be accounted for in the post-treatment inferential statistics that are designed to illuminate differences between the groups that can be attributed to the treatment (Pallant, 2005). If pre-existing differences are present in the pre-treatment data that are not accounted for within the statistical analyses, the differences found in the post-treatment data cannot be attributed to the treatment, which limits the ability to answer the research questions.

Throughout this subset of results a number of statistical extraction methods were employed. Before the results are presented however, a table summarising the main standardised variables of interest and their abbreviations is presented to aid in the reading of the statistical results. After the initial descriptive statistics for the pre-treatment data are presented along with inferential statistics. The descriptive statistics for the anthropometric measurements pre-treatment at Time 1 are presented along with t-test results. In line with the explanation above, t-tests have been employed here to identify pre-existing differences between the treatment group and wait-list control groups before the treatment phase.

After this the descriptive statistics for the 13 main standardised variables of interest are presented, which includes all emotional eating scales, two experiential avoidance, one cognitive fusion and the five health and subjective well-being scales. Following this a Pearson's Bivariate Correlation Matrix is presented which includes the four main weight related variables and the 13 main standardised variables of interest. The aim of the correlation

matrix is to aid in the examination of patterns of relationships that may informally indicate variables that are measuring underlying factors. The identification of patterns of variables is followed by the inclusion of a discriminant function analysis and an exploratory factor analysis for the main standardised variables of interest. The discriminant function analysis was conducted to uncover the dimensions of values that may differentiate the treatment group and the wait-list control group at Time 1 (Moss, 2008). A factor analysis was employed with the main standardised variables of interest to uncover sets of items that correlate with one another and may reflect similar underlying constructs or traits that may be able to differentiate individual group membership which may indicate pre-existing differences at Time 1 (Moss, 2008). Both the discriminant function analysis and the exploratory factor analysis are not crucial components within the statistical analyses to answer the research questions and hypotheses; however they were considered to have potential in aiding the understanding of the sample as a whole.

At the end of these analyses, three MANOVAs (Multivariate Analysis of Variance) are presented and were performed to detect pre-existing group differences on each of the 13 main standardised variables of interest at Time 1. One MANOVA was performed for each of the Emotional Eating Scales and included the other 8 main variables of interest each time. The MANOVA technique falls within the family of statistical techniques that can be used to test for significant differences between groups (Pallant, 2005, p.195). MANOVA was chosen as the most appropriate technique to examine the differences between the treatment and wait-list control group on these same variables at the post-treatment stage or Time 2; thus the same statistic is used at pre and post-treatment for consistency. The reason MANOVA was chosen above other options is because it is specifically designed to accommodate more than one dependent variable within one analysis. This is in comparison to ANOVA (Analysis of Variance) that accommodates one dependent variable within one analysis. It is not

statistically incorrect to use a series of separate ANOVAs to examine each dependent variable (DV); however by doing so the researcher increases the risk of Type I error. Since the inflation of Type I error at the post-treatment stage can lead to misleading results suggesting a treatment has been effective when it has not, it should be avoided. Precautions such as Bonferroni adjustments when using multiple ANOVAs can be made; however the decision was made that MANOVA was the superior choice to use in these analyses (Pallant, 2005). Tabachnick and Fidell (2001) provide an overview of the rationale for using MANOVA. The most significant advantage MANOVA has over ANOVA is that it tests 'whether mean differences among groups on a combination of DVs are likely to have occurred by chance' (Tabachnick & Fidell, 2001, p. 322). MANOVA tests the significance of this composite, or combined DV that is designed to maximise the differences between the group so to separate the groups as much as possible (Pallant, 2005; Tabachnick and Fidell, 2001). The further advantage of the MANOVA procedure is that it also provides the univariate results for each individual dependent variable (Pallant, 2005). Conversely, this means that MANOVA is usually less powerful than ANOVA (Tabachnick & Fidell, 2001), which can be seen as a disadvantage. Both Pallant (2005) and Tabachnick and Fidell (2001) explain that MANOVA is a more complex statistical technique than ANOVA which means that MANOVA is a more conservative statistic to use when exploring differences between groups on multiple DVs. Despite this MANOVA was still considered the superior statistic to use in this research, the conservative nature of the statistic meaning that where significant results are extracted they can be viewed with more confidence knowing that Type I error has been controlled and there is less chance of making inferences about the effectiveness of the treatment that are unfounded.

5.6.3 Post-treatment differences between the treatment group and the wait-list

control group at time 2. The third subset of results is dedicated to describing the post-treatment data and illuminating the differences between the two groups after the treatment phase. Data analyses constituted ‘per-protocol’ analyses, also known as ‘present at follow-up’ analyses. In this section the results begin to answer the research questions and hypotheses explicitly, in contrast to the previous subsets of results that lay the statistical foundations that enable the extraction of reliable and valid statistical results post-treatment. Specifically this subset of results addresses research question 1 and its underlying hypotheses numbered 1.1 through to 1.4.

Firstly, this subset of results addresses hypothesis 1.1, ‘It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will show significantly improved weight outcomes compared to participants in the wait-list control group’. The results present the percentages of participants who either maintained or gained weight in both the treatment and wait-list control groups after the treatment phase measured at Time 2. A chi-square test for independence was employed to identify if any differences were statistically significant. To compliment these results, descriptive statistics and two Pearson’s Bivariate Correlation Matrices (one for Time 2 and one for Difference scores Time 1 – Time 2) are presented. A discriminant function analysis was also employed to assist in differentiating the treatment group and the wait-list control group at Time 2.

To further evaluate the efficacy of the 1-day ACTing on Weight group workshop in impacting weight and weight related variables three one-way between-groups analysis of covariance analyses (ANCOVAs) were conducted for weight, BMI and waistline. As outlined by Pallant (2005) ANCOVA is ideal when there is an experiment with ‘a two-group pre-test/post-test design’ which is the case in this research (p. 263). ANCOVA is also an analysis of variance technique that is used to test for significant differences between groups. It is

superior to a standard ANOVA in pre-test/post-test analyses because it allows for pre-test scores to be statistically controlled so that only differences attributable to the treatment contribute to significant differences as opposed to any pre-existing differences between the groups contaminating differences (Pallant, 2005). Separate ANCOVAs were performed on these three variables due to their magnitude of significance within the research. It is acknowledged that executing multiple analyses can increase the risk of Type I error, however only three tests were performed so the risk was assessed as minimal.

Research hypotheses 1.2 to 1.5 are the focus of the following analyses that seek to evaluate the efficacy of the 1-day ACTing on Weight group workshop in impacting emotional eating, experiential avoidance and cognitive fusion. Here three MANOVAs are presented, one for each emotional eating scale along with experiential avoidance, and cognitive fusion, and the other subsidiary yet main standardised variables of interest. These MANOVAs are comparable to those presented earlier. The rationale for using MANOVA has been presented previously in section 5.6.2

5.6.4 Mediation. The fourth subset of results address research question 2 and hypothesis 2.1 and 2.2. These analyses are dedicated to evaluating mechanisms of action in the treatment outcomes for weight and emotional eating by exploring experiential avoidance and cognitive fusion as an underlying mechanism of action or mediators of change. Subsidiary outcomes are also explored. As mentioned in earlier chapters mediation analysis facilitates the identification of the mechanisms of action involved in an intervention that acts to produce changes in outcome measures (Gregg et al., 2007). Exploring mechanisms of change through mediation analysis has become a championed cause within the ACT research fraternity because it ‘allows for a more complex analysis of treatment effect by examining the relation between processes of change and treatment outcomes’ (Levin & Hayes, 2009, p. 21).

Mediation analysis is a statistical technique that when employed illuminates *how* a causal variable X effects the outcome variable Y . The *how* variable is the mediator variable M . “A simple mediation model is any causal system in which at least one casual antecedent X variable is proposed as influencing an outcome Y through a single intervening variable M ” (A. Hayes, 2013, p. 86).

Mediation analyses were conducted using the ordinary least square path analysis approach with the bias-corrected bootstrap confidence interval option (A. Hayes, 2013). To aid the reading of the results of the mediation analysis, further details of the mediation technique used, general information about mediation, as well as details about interpretation of mediational analysis, have been placed within the mediational analysis section 6.7.1.

Chapter 6

Results

6.1 Sample Characteristics

6.1.1 Sample size. The final sample size and gender for pre and post-treatment measures is presented in Table 3. As expected the sample was predominantly female, with no males completing post-treatment assessments. This is typical within research exploring weight.

Table 3

Sample Size and Participant Gender (N = 99)

	Treatment	Wait-list control
Pre	$n = 43$ (42 = female; 1 = male)	$n = 56$ (54 = female; 2 = male)
Post	$n = 28$ (28 = female)	$n = 32$ (32 = female)

6.1.2 Participant demographic and socio-economic characteristics at baseline.

The mean age of the sample was 44 years old with a standard deviation of 12.5 years. A series of tables are presented in the subsections below that summarise the demographic and socio-economic status variables (see Tables 4 – 47). More specifically, relationship status, information about children, first language and place of birth are presented in Tables 4 – 8. Information about education, employment, occupation and household income is presented in Tables 9 – 15. Information about illness, eating disorders, medication and menopause is presented in Tables 16 – 35. Participant weight related characteristics at baseline are presented in Tables 36 – 47. More specifically, information relating to weight loss and maintenance methods is presented in Tables 36 – 41. Information about participants' food intake and exercise characteristics at baseline are presented in Tables 42 – 45. Participants' goal weight characteristics at baseline, including goal weight ideals in relation to BMI, are presented in Tables 46 – 47.

6.1.2.1 Relationship status, information about children, language spoken and

place of birth. The information collected from the sample included relationship status, number of children and place of birth. This information is presented in Tables 4 – 8. Overall, 59% of participants identified themselves as partnered ($n = 58$) including married ($n = 40$) or in a relationship ($n = 18$). Fifty two percent ($n = 51$) reported having biological children, while at the time of assessment 35% reported having dependent children ($n = 34$). Ninety percent ($n = 89$) reported that their native language is English and most, 82%, were born in Australia ($n = 80$). The majority, 65%, of participants were either engaged in, or had completed, undergraduate degrees or higher ($n = 62$), and 29% ($n = 28$) were currently enrolled in undergraduate degrees or higher education. Eighty nine percent of people were employed, with 52% in full-time employment, 36% part time and 12% in casual or other employment. Using the Australian and New Zealand Standard Classification of Occupations

system, 50% of people identified as 'Professional', 8.4% as Community and Personal Services, and 29% as Clerical and Administrative. Thirty five percent of participants reported their household income to be up to \$100,000, with 24.5% reporting theirs to be up to \$50,000 and 33.5% reporting theirs to be from 100,000 and above.

Table 4

Participant Relationship Status (N = 98)

Relationship Status	All (n = 98)	Treatment (n = 43)	Wait-list control (n = 55)
Single	23	12	11
Married	40	16	24
Living with a Partner or Defacto	12	4	8
In a relationship living separately	6	3	3
Divorced	8	3	5
Widowed	3	2	1
Separated, living apart	5	2	3
Separated, living together	1	1	0
Partnered	58	23	35
Not partnered	40	20	20
Missing values	1	0	1

Table 5

Number of Dependent Children (N = 97)

Number of Dependent Children	All (n = 97)	Treatment (n = 42)	Wait-list control (n = 55)
0	63	28	35
1	9	5	4
2	16	6	10
3	7	3	4
4	2	0	2
Have dependent children	34	14	20
Do not have dependent children	63	28	35
Missing values	2	1	1

Table 6

Number of Biological Children (N = 97)

Number of Biological Children	All (n = 97)	Treatment (n = 42)	Wait-list control (n = 55)
0	46	22	24
1	14	8	6
2	21	8	13
3	12	3	9
4	4	1	3
Do have biological children	51	20	31
Do not have biological children	46	22	24
Missing values	2	1	1

Table 7

Participant First Language (N = 99)

Language	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
English	89	37	51
Russian	2	2	0
Chinese	1	1	0
Mandarin	2	0	2
German	1	1	0
Greek	1	1	0
Italian	2	1	1
Farsi	1	0	1
Missing values	0	0	0

Table 8

Participant Place of Birth (N = 98)

Place of Birth	All (n = 98)	Treatment (n = 42)	Wait-list control (n = 56)
Australia	80	33	47
Asia	5	1	4
Europe	6	4	2
Middle East	1	0	1
New Zealand	4	2	2
England	2	2	0
Missing values	1	1	0

6.1.2.2 Education, employment, occupation and household income. Information

about education, employment, occupation and household income is presented in Table 9 - 15.

Table 9

Participant Level of Education (N = 96)

Education Level Completed	All (n = 96)	Treatment (n = 42)	Wait-list control (n = 54)
Secondary School	15	6	9
Apprenticeship or TAFE	19	10	9
Undergraduate Degree	37	16	21
Post-Graduate Degree	25	10	15
Missing values	3	1	2

Table 10

Participant Current Enrolment in Education (N = 96)

Current Education	All (n = 96)	Treatment (n = 42)	Wait-list control (n = 54)
None	68	28	38
Undergraduate	8	1	7
Post-Graduate	20	10	10
Missing values	3	2	1

Table 11

Participant Employment Status (N = 98)

Employed	All (n = 98)	Treatment (n = 43)	Wait-list control (n = 55)
Yes	87	40	47
No	11	3	8
Missing values	1	0	1

Table 12

Participant Employment Type (N = 87)

Type of Employment	All (n = 87)	Treatment (n = 40)	Wait-list control (n = 47)
Full-time	45	23	22
Part-time	31	13	18
Casual	10	3	7
Other	1	1	0
Missing values	12	3	9

Table 13

Participant Unemployment Type (N = 11)

Type of Unemployment	All (n = 11)	Treatment (n = 3)	Wait-list control (n = 8)
Unemployed	3	2	1
Homemakers	2	0	2
Retired	3	1	2
Student	3	0	3
Missing values	0	0	0

Table 14

Participant Occupation Classification (N = 95)

Occupation classification*	All (n = 95)	Treatment (n = 42)	Wait-list control (n = 53)
Manager	7	2	5
Professional	48	23	25
Community and Personal Services	8	2	6
Clerical and Administrative	28	14	14
Sales	1	1	0
Student	3	0	3
Missing values	4	1	3

Note. *Australian and New Zealand Standard Classification of Occupation, ABS Cat. No. 1220.0 ANZSCO

Table 15

Participant Household Income Level (N = 91)

Household Income	All (n = 91)	Treatment (n = 43)	Wait-list control (n = 55)
\$0-\$25,000	6	2	4
\$25,001-\$50,000	18	8	10
\$50,001-\$75,000	15	6	9
\$75,001-\$100,000	19	13	6
\$100,001-\$150,000	24	9	15
Above \$150,000	9	3	6
Unsure	7	2	5
Up to \$50,000	24	10	14
Up to \$100,000	34	19	15
Above \$100,000	33	12	21
Missing values	4	0	1

6.1.2.3 Illness, eating disorders, medication, and menopause. Information about illness, eating disorders, medication and menopause is presented in Table 16 – 27. Overall 40% of the participants identified with being currently ill, with 10% reporting more than one illness. The most frequently reported illness was depression, 11%. Of those who reported being ill, 42.5% classified their illness as a mental illness, 35% classified their illness as physical, while 22.5% reported having both. Forty seven percent of people reported currently using prescribed medication. Twenty percent of the participants reported using selective serotonin re-uptake inhibitors (SSRI) which are usually prescribed for depression. Blood pressure and cholesterol medications were reported as being used by 17% of participants. Four percent of participants reported currently using Hormone Replacement Treatment (HRT), while 19% reported transitioning through the life stage of menopause. Three percent of participants reported have never been diagnosed with an eating disorder.

Table 16

Participant Report of Being Currently Ill (N = 99)

Currently Ill	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Yes	40	19	21
No	59	24	35
Missing values	0	0	0

Table 17

Participant Report of Type of Illness (N = 99)

Type of Illness	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
None	59	24	35
Depression	11	3	8
Anxiety	2	1	1
Postnatal depression	1	0	1
Diabetes	1	1	0
Bronchiectasis	1	1	0
Neck/Back disc issues	1	0	1
Depression & Hidradenitis suppurativa	1	1	0
Graves' Disease	1	1	0
Kidney Disease	1	1	0
Depression and Fibromyalgia	1	1	0
Arthritis	1	1	0
Crohn's Disease	1	0	1
Diabetes and Sleep Apnoea	1	0	1
Cancer in Remission	1	0	1
Chronic Fatigue Syndrome	1	0	1
Depression and Thyroid problems	1	0	1
Bronchiectasis & ruptured disc in neck	1	1	0
Diabetes, Hypertension and Asthma	1	0	1
Depression and Anxiety	2	2	0
Diabetes and Hypertension	2	1	1
PMT (Premenstrual syndrome)	2	2	0
Depression and Hypertension	2	1	1
Fibromyalgia	1	0	1
Depression and Diabetes	1	0	1
Lymphodema and Cellulitis	1	1	0

Table 18

Participant Report of Current Illnesses (N = 99)

Number of Current Illness	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
None	59	24	35
1	27	11	16
2	12	8	4
3	1	0	1
Missing values	1	0	0

Table 19

Participant Report of Current Illnesses Summarised as Mental or Physical Illness (N = 40)

Mental or Physical Illness	All (n = 40)	Treatment (n = 19)	Wait-list control (n = 21)
Mental	17	7	10
Physical	14	9	5
Both Mental and Physical	9	3	6
Missing values	0	0	0

Table 20

Participant Report of Lifetime Diagnosis of Eating Disorders (N = 99)

Diagnosed with an Eating Disorder	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
No	96	41	55
Yes	3	2	1
Anorexia Nervosa	1	1	0
Bulimia Nervosa	2	1	1
Missing values	0	0	0

Table 21

Participant Report of Current Use of Prescribed Medication (N = 99)

Currently taking Medication	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Yes	47	21	26
No	52	22	30
Missing values	0	0	0

Table 22

Participant Report of Number of Prescribed Medications (N = 98)

Number of Medications taking	All (n = 98)	Treatment (n = 43)	Wait-list control (n = 55)
None	52	22	30
1	31	16	15
2	9	5	4
3	6	0	6
Missing values	1	0	1

Table 23

Participant Report of Name of Current Medications (N = 98)

Name of Medication	All (n = 98)	Treatment (n = 43)	Wait-list control (n = 55)
None	52	22	30
Blood Pressure	6	4	2
Blood Pressure and Cholesterol	3	1	2
Selective serotonin re-uptake inhibitors (SSRI)	15	9	6
Airway assistance	1	0	1
Thyroid	2	0	2
Anti-inflammatory	3	2	1
Panatela	1	0	1
Hay fever	1	0	1
Carbimazole	1	1	0
Breast Cancer Drug	1	0	1
Airways and Anti-biotic	1	1	0
SSRI Cholesterol and Peptic Ulcer	1	0	1
SSRI and Reflux	1	0	1
Blood Pressure and SSRI	1	1	0
Thyroid anti-inflammatory and anti-uricaemic	1	0	1
SSRI Cholesterol and Blood Glucose	1	0	1
Dopamine agonist Cholesterol and aspirin	1	0	1
Benzo, antipsychotic and reflux	1	0	1
Blood Pressure and SNRI	1	0	1
SSRI and Cholesterol	1	1	0
Blood Pressure, Airways and Anxiety	1	0	1
Cholesterol	1	1	0
Missing values	1	0	1

Table 24

Participant Report of Vitamins Currently Being Taken (N = 99)

Taking Vitamins	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Yes	27	13	14
No	72	30	42
Missing values	0	0	0

Table 25

Participant Report of the Contraceptive Pill Currently Being Taken (N = 99)

Taking Contraceptive Pill	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Yes	8	5	3
No	91	38	53
Missing values	0	0	0

Table 26

Participant Report of Current Hormone Replacement Treatment (HRT) (N = 99)

Taking HRT	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Yes	4	0	4
No	95	43	52
Missing values	0	0	0

Table 27

Participant Report of Being in the Life Stage of Menopause (N = 96)

In Life Stage of Menopause	All (n = 96)	Treatment (n = 43)	Wait-list control (n = 53)
Yes	19	12	7
No	77	31	46
Missing values	3	0	3

6.1.2.4 Participant weight related characteristics at baseline. Information about participant weight related characteristics, including weight loss efforts, intentions and satisfaction at baseline is presented in Tables 28 - 41. Ninety eight percent of participants reported that their most recent weight loss was a result of a conscious weight loss effort, with 50% reporting they were either satisfied or very satisfied with their recent weight loss; however, only 10% were at least satisfied with their current weight, and 97% reported wanting to lose more weight. Seventy three percent reported that it was either difficult or very difficult to maintain their weight loss. The most common reported frequency of self-weighing was once per week at 27%, followed by 1-3 per month 22%, once per day 19%, more than once a week was 15%, almost never 8%, and 4% for both a few times per week and more than once per day. The number of times participants reported having tried to lose weight ranges from 0 to over 20 with 29% reporting they have tried over 20 times, 19% have tried between 10-20 times, and 48% have tried between two and 10 times. Participants' maximum reported weight ranges from 54kgs to over 170kgs, with 27% of participants falling within the range of 75kg to 84.9kg, 23% of participants falling within the range of 85kg to 99.9kg, and 15% falling within the range of 100kg to 114.9kg. Overall there were 19 combinations of weight loss methods reported. Forty six percent reported using a combination of diet and exercise alone, with a further 12% reporting using diet and exercise along with attendance at a weight loss club, 9% reported only using dietary intake/diet. Overall 77% of people reported using a combination of methods that included diet and exercise to lose weight. Fifty seven percent of participants did not access a weight loss club to lose weight, 14% attended Weight Watchers International and 6% used Lite n' Easy. At the time of assessment 22% of participants were attending a weight loss club, with 12% of participants attending Weight Watchers International. Eighty three of participants reported not using a weight maintenance program while 71% reported using weight maintenance guidelines at least once per week

with 19% using them each day per week, with 16% using them five days a week and 15% using them four days a week.

Table 28

Current Weight Achieved Through Conscious Weight Loss Effort (N = 99)

	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Yes	97	43	54
No	2	0	2

Note. Item was worded as, “Was current weight loss achieved via a conscious effort to lose weight?”.

Table 29

Participant Reported Overall Satisfaction With Recent Weight Loss (N = 99)

	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Very Dissatisfied	3	1	2
Dissatisfied	25	10	15
Neither satisfied not dissatisfied	21	9	12
Satisfied	37	19	18
Very Satisfied	13	4	9

Table 30

Participant Reported Satisfaction With Current Weight (N = 99)

	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Very Dissatisfied	14	5	9
Dissatisfied	62	28	34
Neither satisfied not dissatisfied	13	6	7
Satisfied	8	4	4
Very Satisfied	2	0	2

Table 31

Participant Self-Reported Frequency of Self Weighing (N = 99)

	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Almost Never	8	3	5
A few times a week	4	1	3
1-3 time per month	22	13	9
Once per week	27	10	17
More than once per week	15	8	7
Once per day	19	6	13
More than once per day	4	2	2

Table 32

Participant Rate of Difficulty or Ease of Weight Loss Maintenance (N = 99)

	All (n = 98)	Treatment (n = 43)	Wait-list control (n = 56)
Very Difficult	21	6	15
Difficult	51	27	24
Neither difficult nor easy	20	6	14
Easy	6	4	2
Very Easy	1	0	1

Table 33

Current Weight Loss/Maintenance Intentions (N = 99)

	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Lose more weight	96	42	54
Maintain weight	3	1	2

Table 34

Number of Times Tried to Lose Weight (N = 99)

	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
0	1	0	1
1	2	0	2
2-3	14	3	11
4-6	21	11	10
7-9	13	10	3
10-12	6	3	3
13-15	4	1	3
15-20	9	2	7
<20	29	13	16

Table 35

Maximum Life Time Weight in Kilograms (N = 99)

Kilograms	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
54-64.9	7	0	7
65-74.9	13	6	7
75-79.9	13	4	9
80-84.9	14	4	10
85-89.9	5	3	2
90-94.9	11	7	4
95-99.9	7	4	3
100-104.9	7	3	4
105-109.9	4	2	2
110-114.9	4	2	2
115-119.9	1	0	1
120-129.9	5	4	1
130-139.9	3	2	1
140-149.9	2	0	2
150-159.9	1	0	1
160-169.9	1	1	0
<170	1	1	0

Table 36

Weight Loss Methods Used to Lose Weight (N = 99)

Weight loss method used	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
Dietary intake/diet	9	3	6
Diet and exercise	46	17	29
Exercise	1	0	1
Weight loss club or structured program	7	6	1
Meal replacement	3	1	2
Diet, exercise and meal replacement	4	4	0
Diet, exercise and weight loss club	12	6	6
Diet, exercise, weight loss club and meal replacement	2	1	1
Diet, exercise, weight loss club, meal replacement and pre-prepared meals	2	1	1
Lap band	1	0	1
Diet and appetite suppressant	1	0	1
Diet, exercise, weight loss club, meal replacement, and appetite suppressant	1	0	1
Weight loss club and pre-prepared meals	1	1	0
Diet, exercise and pre-prepared meals	3	1	2
Diet, exercise and personal trainer	1	1	0
Diet, exercise and appetite suppressant	2	1	1
Self hypnosis CD	1	0	1
Diet, exercise, meal replacement and pre-prepared Meals	1	0	1
Diet, exercise, weight loss club and pre-prepared Meals	1	0	1

Table 37

Diet and Exercise in Weight Loss Effort (N = 99 - 98)

	All	Treatment	Wait-list control
Were diet and exercise used together to lose weight?			
Yes	77	32	45
No	22	11	11
Was diet alone used in your weight loss effort?			
Yes	13	5	8
No	86	38	48
Was exercise alone used in your weight loss effort?			
Yes	1	0	1
No	97	43	54

Table 38

Name of Weight Loss Club Used to Lose Weight (N = 99)

Name of weight loss club	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
None	57	23	34
Weight Watchers	14	8	6
Tony Ferguson	3	1	2
Ultra lite	2	0	2
Jenny Craig	1	0	1
Lite n' Easy	6	3	3
Curves	4	2	2
Michelle Bridges	1	0	1
Weight Watchers and Lite n' Easy	1	0	1
Body Trim	1	0	1
Fernwood Gym	1	0	1
Ultralite, Lite n' Easy and Isagenix	1	1	0
Tony Ferguson and Biggest Loser	1	1	0
Sparks People	1	1	0
Baker IDI	1	1	0
Weight it up Australia	1	1	0
Personal Trainer	1	1	0
Dietician	1	0	1
Cohen's Lifestyle	1	0	1

Table 39

Name of Weight Loss Club Currently Using (N = 99)

Name of weight loss club	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
None	78	33	45
Weight Watchers	12	7	5
Jenny Craig	1	0	1
Lite n' Easy	2	0	2
Curves	1	0	1
Michelle Bridges	1	0	1
Tony Ferguson & Biggest Loser	1	1	0
Baker IDI	1	1	0
Personal Trainer	1	1	0
Dietician	1	0	1

Table 40

Name of Weight Maintenance Program Using (N = 99)

Name of weight maintenance program	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
None	83	34	49
Weight Watchers	6	4	2
Lite n'Easy	1	0	1
Curves	2	0	2
Michelle Bridges	1	0	1
Tony Ferguson & Biggest Loser	1	1	0
Weight it up Australia	1	1	0
Personal Trainer	1	1	0
Dietician	1	0	1
Naturopath	1	1	0
Lift for Life	1	1	0

Table 41

Number of Days Per Week Weight Maintenance Program Guidelines are Used (N = 99)

Number of days per week	All (n = 99)	Treatment (n = 43)	Wait-list control (n = 56)
0	28	10	18
1	2	0	2
2	4	2	2
3	7	3	4
4	15	6	9
5	16	8	8
5.5	1	1	0
6	7	4	3
7	19	9	10

6.1.2.5 Participant food intake, exercise characteristics at baseline and satisfaction with weight loss maintenance strategies. Information about participants food intake and exercise characteristics at baseline are presented in Tables 42 - 47. Overall 80% of participants reported monitoring their food intake at least once per week, with 28.5% monitoring it each day of the week, 20% reported not monitoring their food intake. Twenty percent of participants reported monitoring their food intake at each meal each day of the week, while 28% reported not monitoring each meal. Twenty four percent of participants reported not being satisfied with their weight maintenance strategies while 21% reported being satisfied an average of 5-7 days per week. Twenty eight percent of participants reported doing 30 minutes or more of walking five or more times per week, while 19% reported doing none. Sixty two percent of participants' ideal weight was between 1-10kg lighter than their actual weight. Ninety eight percent of participants had a goal weight in mind, with 20% achieving this weight through their most recent weight loss effort, while 60% had reached their goal weight at some time. It was found that 50% of participants' goal weight fell within

the range of healthy BMI while 37% fell within the overweight range and 12% within the obese range.

Table 42

Average Number of Days Participants Monitor Food Intake (N = 98)

Group	0	1	2	3	4	5	6	7
Total	20	2	6	9	10	18	5	28
Treatment (n = 42)	7	1	2	5	6	8	2	11
Wait-list Control (n = 56)	13	1	4	4	4	10	3	17

Table 43

Average Number of Days Participants Monitor Food Intake at Every Meal (N = 99)

Group	0	1	2	3	4	5	6	7
Total	28	5	10	8	7	16	5	20
Treatment (n = 43)	11	2	4	6	2	6	4	8
Wait-list Control (n = 56)	17	3	6	2	5	10	1	12

Table 44

Average Number of Days Participants Were Satisfied With Weight Maintenance Strategies (N = 99)

Group	0	1	2	3	4	5	6	7
Total	24	11	12	14	17	12	7	2
Treatment (n = 43)	12	2	8	4	7	5	4	1
Wait-list Control (n = 56)	12	9	4	10	10	7	3	1

Table 45

Level of Physical Activity

Times per week	5 or more times a week	3-4 times a week	1-2 times a week	none
How many times a week do you usually do 30 minutes or more walking? (e.g. walking from place to place for exercise, leisure or recreation?)				
Total (<i>N</i> = 98)	28	23	28	19
Treatment (<i>n</i> = 42)	11	8	12	11
Wait-list Control (<i>n</i> = 56)	17	15	16	8
How many times a week do you usually do 30 minutes or more of moderate-intensity physical activity that increases your heart rate or makes you breathe harder than normal? (e.g. carrying light loads, bicycling at a regular pace, or doubles tennis).				
Total (<i>N</i> = 99)	16	18	35	30
Treatment (<i>n</i> = 42)	4	9	19	11
Wait-list Control (<i>n</i> = 56)	12	9	16	19

Table 46

Difference Between Actual Weight and Goal Weight (N = 96)

Difference in Kilograms	All (<i>n</i> = 96)	Treatment (<i>n</i> = 41)	Wait-list control (<i>n</i> = 56)
<0	6	3	4
1-4.9	16	3	13
5-5.9	10	3	7
6-6.9	8	5	3
7-7.9	9	4	5
8-8.9	6	0	6
9-9.9	5	4	1
10-10.9	3	2	1
11-11.9	5	4	1
12-12.9	1	0	1
13-13.9	4	3	1
14-14.9	3	2	2
15-19.9	6	2	4
20-24.9	6	3	3
25-29.9	4	1	3
30-34.5	1	1	0
35-39.9	0	0	0
40-50	2	1	1
>50	1	0	0

Table 47

Participant Goal Weight Attainment and Goal Weight in Relation to BMI (N = 99 – 97)

	All	Treatment	Wait- list control
Currently have a goal weight in mind? (N = 99)			
Yes	97	41	56
No	2	2	0
Was most recent goal weight achieved? (N = 97)			
Yes	20	8	12
No	77	33	44
Ever reached goal weight? (N = 98)			
Yes	59	31	28
No	39	12	27
Goal weight within the healthy BMI weight range as determined by researcher. (N = 97)			
Yes	49	19	26
No	48	22	30
BMI weight range for disclosed goal weight. (N = 97)			
Healthy	49	19	30
Overweight	36	16	20
Obese	12	6	6

6.1.3 Group differences for a subset of participant characteristics. Multiple chi-square tests for independence were conducted to identify any significant differences between the treatment group and the wait-list control group in terms of the frequency of participants within the above mentioned sample characteristics' variable categories at baseline. The variables tested comprise demographic and socio-economic variables traditionally reported in empirical research as well as several variables deemed to be important in relation to the topic of this research. Where applicable Fisher's Exact Test is reported. There were no significant differences between the treatment and wait-list control groups on any variable, results are presented in Table 48.

Table 48

Group Differences for a Subset of Participant Characteristics Collected at Baseline

Variable	Pearson Chi-Square or Fisher's Exact Test	<i>p</i>
Relationship status (partnered/not partnered)	0.41#	.41
Dependent children (yes/no)	0.10	.76
Biological children (yes/no)	0.73	.39
Education level (Secondary; TAFE; Undergraduate; Postgraduate)	0.84	.84
Employment (yes/no)	0.34#	.34
Household income (up to \$50000; up to \$100000; up to \$150000)	2.87	.24
Currently ill (yes/no)	0.45	.50
Currently taking medications (yes/no)	0.06	.81
In life stage of menopause (yes/no)	3.23	.07
Diagnosed with an Eating Disorder (yes/no)	0.58#	.58

Note. # denotes Fisher's Exact Test

6.1.4 Group differences in anthropometric measurements at registration. Initial anthropometric measurements including self-report and nurse report weight, height and waistline, along with other weight variables of interest including recent weight lost and percentage of weight lost were recorded at the registration stage. These variables were explored and t-tests were executed to detect differences between the treatment group and wait-list control group before the treatment. There were no group differences detected; the results along with descriptive statistics are presented in Table 49.

Table 49

Descriptive Statistics and T-test Results for Anthropometric Measurements and Other Weight Variables at Registration (N = 99-98)

Variable	N	M	SD	t	p
Self report weight lost in last 6 months					
Treatment	43	7.78	4.18	0.03	.98
Wait-list control	56	7.74	7.54		
Self report starting weight					
Treatment	43	90.85	23.10	1.43	.16
Wait-list control	56	84.45	21.27		
% of Weight lost in last 6 months					
Treatment	43	8.74	4.47	0.15	.88
Wait-list control	56	8.59	5.65		
Self report weight reported to nurse					
Treatment	42	83.64	21.75	1.53	.13
Wait-list control	56	77.54	17.84		
Self report height reported to nurse					
Treatment	43	1.65	.079	0.31	.76
Wait-list control	56	1.64	.078		
Nurse report height					
Treatment	43	1.64	.079	0.38	.70
Wait-list control	56	1.64	.076		
Nurse report weight					
Treatment	43	84.06	21.40	1.47	.14
Wait-list control	56	78.23	17.94		
Nurse report BMI					
Treatment	43	31.34	8.64	1.64	.10
Wait-list control	56	29.05	5.20		
Nurse report waistline					
Treatment	43	101.8	15.15	1.22	.22
Wait-list control	56	98.21	14.08		
Difference between SR and nurse report weight					
Treatment	42	0.79	1.34	0.30	.77
Wait-list control	56	0.69	1.76		

6.2 Summary of First Subsection of Results: Sample Characteristics

To summarise, this section has described the sample. It has provided data pertaining to the areas of demographics, socio-economic status and weight related variables. It also began to explore for pre-treatment differences between the treatment group and wait-list control group. Statistical analyses indicated there were no significant statistical group differences on a selection of demographic and socioeconomic variables traditionally reported in empirical studies nor on anthropometric measurement and other weight related variables.

6.3 Pre-Treatment Data for the Main Standardised Variables of Interest and Anthropometric Measurements

To refresh the reader's memory of the measures used in this study, the main standardised variables of interest along with a note on interpretation direction are presented in Table 50. Following that are the results for the measures as assessed at the pre-treatment stage, or Time 1, for both the anthropometric measurements and the main standardised variables of interest.

Table 50

A Summary of the Variables, Measures, Acronyms, and Score Interpretation

Variable and Measure	Acronym	Interpretation
Emotional Eating (EE)		
The Emotional and Stress Related Eating subscale of The Eating and Appraisal Due to Emotions & Stress	ESRE	Lower scores = Higher EE
The Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire	DEBQEE	High scores = Higher EE
The Emotional Eating Scale subscales:	EES	High scores
- Anger/Frustration	EESAnF	= Higher EE
- Anxiety	EESAnx	
- Depression	EESDep	
Experiential Avoidance (EA)		
Acceptance and Action Questionnaire for Weight	AAQW	Higher scores = Higher EA
Acceptance and Action Questionnaire version II	AAQII	Higher scores = Higher EA
Cognitive Fusion (CF)		
Cognitive Fusion Questionnaire-28	CFQ28	Higher scores = Higher CF
Health and Subjective Well-being		
Satisfaction with Life Scale	SWLS	Higher scores = Higher satisfaction with life
Positive & Negative Affect Scale	PANAS	Higher scores =
Positive affect (PA)	PA	Higher PA
Negative affect (NA)	NA	Higher NA
The General Health Questionnaire -12	GHQ12	Higher scores = Higher Illness
Obesity Related Well-being Questionnaire	ORWELL	Higher scores = Lower quality of life
Anthropometric Measurements		
Nurse Report Weight	NRW	
Nurse Report Height	NRH	
Nurse Report BMI	NRBMI	
Nurse Report Waistline	NRWaist	

6.3.1 Anthropometric measurements time 1 pre-treatment. Anthropometric measurements were measured and recorded by the Registered Nurse, at Time 1. No significant differences were detected between the treatment group and the wait-list control group on these measurements using *t*-tests. Descriptive statistics and group difference results are presented in Table 51.

Table 51

Descriptive Statistics and T-test results for Anthropometric Measurements at Time 1 Pre-Treatment (N = 99)

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Nurse report height					
Total sample	99	1.64	0.08		
Treatment	43	1.64	0.08	0.38	.70
Wait-list Control	56	1.64	0.08		
Nurse report weight					
Total Sample	99	80.76	19.60		
Treatment	43	84.07	21.30	1.48	.14
Wait-list Control	56	78.23	17.94		
Nurse report BMI					
Total Sample	99	30.11	6.97		
Treatment	43	31.36	8.58	1.57	.12
Wait-list Control	56	29.15	5.31		
Nurse report waistline					
Total Sample	99	99.50	15.07		
Treatment	43	101.21	16.29	0.90	.33
Wait-list Control	56	98.19	14.06		

NB: Equal variances assumed

6.3.2 Descriptive statistics for the main standardised variables of interest at Time 1 pre-treatment. Means, standard deviations, and Cronbach's alphas were extracted for the main standardised variables of interest and summarised in Table 52. As previously noted in the measures section all the alphas indicated adequate internal consistency with the exception of EESDep which was lower than expected. According to Pallant (2005) "the Cronbach's alpha coefficient of a scale should be above .7" (Pallant, 2005, p. 90). This lower-

than-expected alpha for EESDep can be at least partly explained by the low number of items that constitute the scale. It only has five items; in situations such as this Pallant (2005) recommends calculating the inter-item correlation with the goal of obtaining a correlation between .2 and .4. The inter-item correlation for the EESDep is .24, falling within the adequate range.

Table 52

Descriptive Statistics for the Main Standardised Variables of Interest at Time 1 Pre-Treatment (N = 99-96)

Standardised Questionnaires		N	M	SD	Cronbach's alphas
ESRE:	Total Sample	99	61.50	13.09	.89
	Treatment	43	61.19	11.79	
	Wait-list Control	56	61.75	14.10	
DEBQEE:	Total Sample	98	3.63	0.66	.86
	Treatment	42	3.67	0.69	
	Wait-list Control	56	3.60	0.65	
EESAnF:	Total Sample	96	30.39	9.14	.86
	Treatment	42	29.99	8.47	
	Wait-list Control	54	30.69	9.70	
EESAnx:	Total sample	96	22.47	6.83	.80
	Treatment	42	22.93	6.06	
	Wait-list Control	54	22.11	7.41	
EESDep:	Total Sample	96	17.10	3.57	.61 .24#
	Treatment	42	17.14	3.35	
	Wait-list Control	54	17.07	3.76	
AAQW:	Total Sample	99	87.28	21.79	.91
	Treatment	43	91.37	20.40	
	Wait-list Control	56	84.13	22.46	
AAQII:	Total Sample	99	25.06	8.58	.88
	Treatment	43	26.14	8.70	
	Control	56	24.23	8.47	
CFQ28:	Total Sample	99	108.27	24.16	.94
	Treatment	43	113.23	26.19	
	Wait-list Control	56	104.46	21.95	
SWLS:	Total sample	99	21.05	7.16	.89
	Treatment	43	20.71	7.12	
	Wait-list Control	56	21.30	7.25	

Standardised Questionnaires		<i>N</i>	<i>M</i>	<i>SD</i>	Cronbach's alphas
PA:	Total Sample	99	32.54	7.24	.90
	Treatment	43	32.96	7.99	
	Wait-list Control	56	32.21	6.65	
NA:	Total Sample	99	20.76	7.17	.87
	Treatment	43	21.77	7.39	
	Wait-list Control	56	19.98	6.97	
GHQ12:	Total Sample	99	13.17	6.30	.90
	Treatment	43	13.76	7.12	
	Wait-list Control	56	12.71	5.62	
ORWELL:	Total sample	98	54.67	15.25	.94
	Treatment	42	58.63	14.73	
	Wait-list Control	56	51.70	15.08	

Note. ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; EESAnF = Emotional Eating Scale - Anger Frustration subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; EESDep = Emotional Eating Scale - Depression subscale; AAQW = Acceptance and Action Questionnaire Weight; AAQII = Acceptance and Action Questionnaire II; CFQ28 = Cognitive Fusion Questionnaire 28 item version; SWLS = Satisfaction with Life Scale; PA = Positive Affect; NA = Negative Affect; GHQ12 = General Health Questionnaire-12; ORWELL = Obesity related Well-being Questionnaire. # Inter-item correlation.

6.3.3 Bivariate correlations for main standardised variables of interest at time

1 pre-treatment. Pearson's bivariate correlations were extracted for the main standardised variable of interest at Time 1, results are presented in Table 53.

All significant correlations were in the expected direction. Unexpectedly the weight related variables showed a very limited number of significant correlations with the 12 main standardised variables of interest. Weight, BMI and waistline were all significantly correlated with cognitive fusion at the $p < .01$ level, with the AAQII showing a trend for significance at the $p < .1$ level for each as well. There was a significant correlation with BMI and the ORWELL at the $p < .05$ level and a trend for weight and the ORWELL at the $p < .01$ level. The inter-correlations between Weight, BMI and waistline were all correlated at the $p < .01$ level. The correlations between the main standardised variables of interest not including weight are highlighted next.

SWLS was significantly correlated with all twelve variables, nine at the $p < .01$ level and EESAnF, EESAnx, EESDep at the $p < .05$ level. The direction of the correlations were

all as expected so that low satisfaction with life is associated with high emotional eating, high experiential avoidance, high cognitive fusion, high negative affect, and less positive affect, health and well-being. GHQ12 was significantly correlated with nine variables, eight at the $p < .01$ level, DEBQEE at the $p < .05$ level, with EESAnF, EESAnx, EESDep not significantly correlated. PA was significantly correlated with all six variables at the $p < .01$ level, EESDep at the $p < .05$ level. The ORWELL, NA and DEBQEE trended toward significance at the $p < .1$ level, while the ESRE, EESAnF, EESAnx were not significant. NA was significantly correlated with ten variables at $p < .01$; there was a trend toward significance for PA at the $p < .1$ level and was not significant for EESDep. Emotional Eating as measured by the DEBQEE was significantly correlated to eleven of the variables, ten at the $p < .01$ level with the correlation with GHQ12 at the $p < .05$ level and a trend toward significance for PA. Emotional eating as measured by the ESRE was significantly correlated to eleven of the variables at the $p < .01$ level with the correlation with PA not significant. Emotional eating as measured by the EESAnF was significantly correlated to ten variables, nine were significant at the $p < .01$ level, SLWS were significant at the $p < .05$ level and GHQ12 and PA were not significant. Emotional eating as measured by the EESAnx was significantly correlated to ten variables, nine were significant at the $p < .01$ level, SLWS were significant at the $p < .05$ level and GHQ12 and PA were not significant. Emotional eating as measured by the EESDep was significantly correlated to ten variables, seven were significant at the $p < .01$ level, SWLS, PA and EESDep were significant at the $p < .05$ level and GHQ12 and NA were not significant. Experiential avoidance as measured by the AAQII was significantly correlated to all twelve variables, eleven of the variables at the $p < .01$ and EESDep at the $p < .05$ level. There was a trend toward significance for weight, BMI and waistline at the $p < .1$ level. Experiential avoidance as measured by the AAQW was significantly correlated with all twelve variables at the $p < .01$ level. Obesity related well-being as measured by the

ORWELL was significantly correlated with all eleven variables at the $p < .01$ level, PA showed a trend toward significant at the $p < .1$ level. Cognitive fusion as measured by the CFQ28 was significantly correlated with all twelve variables at the $p < .01$ level.

Table 53

Pearson's Bivariate Correlations for Standardised Variables at Time 1 Pre-Treatment

	NRW	NRH	NRBMI	NRWaist	SWLS	GHQ12	PA	NA	DEBQEE	ESRE	EESAnF	EESAnx	EESDep	AAQII	AAQW	ORWELL	CFQ28
NRW	1.00																
NRH	.35**	1.00															
NRBMI	.91**	-.06	1.00														
NRWaist	.88**	.19#	.87**	1.00													
SWLS	.03	.18#	-.03	.05	1.00												
GHQ12	-.04	-.02	-.05	-.09	-.46**	1.00											
PA	.06	-.02	.09	.15	.47**	-.35**	1.00										
NA	-.10	-.08	-.08	-.09	-.49**	.55**	-.19	1.00									
DEBQEE	.08	-.02	.09	.08	-.31**	.22*	-.18#	.34**	1.00								
ESRE	-.10	-.04	-.08	-.07	.31**	-.28**	.18	-.37**	-.78**	1.00							
EESAnF	.11	.06	.07	.08	-.22*	.09	-.08	.35**	.72**	-.64**	1.00						
EESAnx	.01	.01	.00	.09	-.20*	-.02	-.02	.31**	.58**	-.55**	.68**	1.00					
EESDep	.05	.08	-.01	-.01	-.23*	.15	-.25*	.14	.58**	-.5**	.39**	.43**	1.00				
AAQII	-.19#	-.13	-.17#	-.19#	-.64**	.46**	-.37**	.64**	.39**	-.41**	.37**	.33**	.23*	1.00			
AAQW	-.04	-.12	-.02	-.08	-.53**	.34**	-.27**	.49**	.55**	-.66**	.47**	.38**	.41**	.60**	1.00		
ORWELL	.19#	-.07	.22*	.16	-.47**	.38**	-.17#	.54**	.47**	-.52**	.41**	.42**	.32**	.50**	.73**	1.00	
CFQ28	-.27**	-.08	-.28**	-.28**	-.48**	.40**	-2.8**	.59**	.36**	-.43**	.33**	.32**	.34**	.70**	.64**	.64**	1.00

Note. NRW = Nurse report weight; NRH = Nurse report height; NRBMI = Nurse report Body Mass Index; NRWaist = Nurse report waistline; SWLS = Satisfaction with Life Scale; GHQ12 = General Health Questionnaire-12; PA = Positive Affect; NA = Negative Affect; DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; EESAnF = Emotional Eating Scale -Anger Frustration subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; EESDep = Emotional Eating Scale - Depression subscale; AAQII = Acceptance and Action Questionnaire II; AAQW = Acceptance and Action Questionnaire Weight; ORWELL = Obesity related Well-being Questionnaire; CFQ28 = Cognitive Fusion Questionnaire 28 item version. *Correlation is significant at the 0.05 level (two-tailed); ** Correlations significant at the 0.01 level (two-tailed); # Correlation trending toward significance at the $p < 0.1$ level. $N = 99-96$.

6.3.4 Exploratory factor analysis and discriminant function analysis at time 1.

Despite not being crucial analyses to be performed to answer the research questions and hypotheses both a factor analysis and discriminant function analysis were conducted to aid understanding of the data composition. The results of these can be found in Appendix T. Overall for the factor analysis three factors were extracted 1) emotional eating, 2) psychological well-being, 3) weight. The discriminant function analysis did not yield a significant result indicating that no group of variables differentiated the two groups before the treatment intervention.

6.3.5 Group differences on emotional eating, experiential avoidance, cognitive

fusion, and health and subjective well-being at Time 1 pre-treatment. Emotional eating, experiential avoidance, cognitive fusion, health and subjective well-being were all measured at Time 1 pre-treatment using the standardised measures as outlined above. To detect any significant group difference on each variable of interest at Time 1 pre-treatment that may need to be accounted for when assessing the treatment effect at Time 2, a series of MANOVAs (Multivariate Analysis of Variance) were performed. In total three MANOVAs were performed, one Emotional Eating scale was entered into each MANOVA along with the following variables: AAQW, AAQII, CFQ28, SWLS, PA, NA, GHQ12 and ORWELL.

When the ESRE was entered the MANOVA did not yield significant results $F(9, 87) = 1.07$, $p = .39$; Wilks' Lambda = 0.90; partial eta squared = 0.10. When the DEBQEE was entered the MANOVA did not yield a significant results $F(9, 87) = 1.12$, $p = .37$; Wilks' Lambda = 0.90; partial eta squared = 0.103. When the ESS subscales was entered the MANOVA did not yield a significant results $F(11, 83) = 0.93$, $p = .52$; Wilks' Lambda = 0.89; partial eta squared = 0.11. The results show that there are no significant differences between the treatment group and the wait-list control group at Time 1 pre-treatment on the variables

measuring emotional eating, experiential avoidance, cognitive fusion, health and subjective well-being.

6.4 Summary of Results for Pre-treatment Data for the Main Standardised Variables of Interest and Anthropometric Measurement

To summarise, this section focused on describing the pre-treatment data and elucidating any pre-existing differences between the treatment group and the wait-list control group before the treatment phase. Means and standard deviations were reported for each main standardised variable of interest. The exploratory factor analysis suggested that variables employed to measure specific theoretical domains are measuring the areas they purport to measure and are appropriately related to each other. The discriminant function analysis indicated that there is no group of variables that together are able to differentiate between the treatment group and the wait-list control group, and this suggests that the two groups are not significantly different from other pre-treatment. Four t-tests and three MANOVAs concur with the discriminant function analysis, with results showing no statistically significant difference between each group on each variable of interest.

6.5 Post-Treatment Descriptive Statistics and Group Differences Between the Treatment Group and the Wait-list Control Group at Time 2

6.5.1 Descriptive statistics for the main variables of interest pre and post-treatment at Time 1 and Time 2. Descriptive statistics are presented for Time 2, with Time 1 results included for ease of comparison, see Table 54.

Table 54

Descriptive Statistics for Main Variables of Interest Time 1 and Time 2 (N = 99-96)

		Time 1			Time 2		
Variables	<i>N</i>	<i>M</i>	SD	<i>N</i>	<i>M</i>	SD	
ESRE							
Total Sample	99	61.50	13.09	60	68.30	16.45	
Treatment	43	61.19	11.80	28	75.55	13.80	
Wait-list control	56	61.75	14.10	32	61.97	16.13	
DEBQEE							
Total Sample	98	3.63	0.66	59	3.34	0.85	
Treatment	42	3.67	0.69	28	2.99	0.81	
Wait-list control	56	3.60	0.65	31	4.77	0.78	
EESAnF							
Total Sample	96	30.39	9.14	59	28.31	10.19	
Treatment	42	29.99	8.47	28	23.85	7.64	
Wait-list control	54	30.69	9.69	31	32.34	10.62	
EESAnx							
Total sample	96	22.47	6.83	59	20.77	7.58	
Treatment	42	22.93	6.06	28	18.79	6.23	
Wait-list control	54	22.11	7.41	31	22.57	8.31	
EESDep							
Total Sample	96	17.10	3.57	59	15.92	4.20	
Treatment	42	17.14	3.35	28	14.89	3.65	
Wait-list control	54	17.07	3.76	31	16.84	4.50	
AAQW							
Total Sample	99	87.28	21.79	60	80.93	22.46	
Treatment	43	91.37	20.41	28	77.42	21.59	
Wait-list control	56	84.14	22.46	32	83.99	23.10	
AAQII							
Total Sample	99	25.06	8.58	59	23.54	8.05	
Treatment	43	26.14	8.70	28	23.93	7.48	
Control	56	24.23	8.47	31	23.20	8.64	
CFQ28							
Total Sample	99	108.27	24.16	60	100.05	24.82	
Treatment	43	113.24	26.19	28	97.07	21.84	
Wait-list control	56	104.46	21.95	32	102.66	27.24	
SWLS							
Total sample	99	21.05	7.16	60	22.97	6.61	
Treatment	43	20.71	7.12	28	23.07	7.01	

Variables	<i>N</i>	Time 1			<i>N</i>	Time 2	
		<i>M</i>	<i>SD</i>			<i>M</i>	<i>SD</i>
Wait-list control	56	21.30	7.25		32	22.88	6.34
PA							
Total Sample	99	32.54	7.24		60	34.04	7.35
Treatment	43	32.95	7.99		28	35.56	8.43
Wait-list control	56	32.21	6.65		32	32.72	6.09
NA							
Total Sample	99	20.76	7.17		60	18.65	6.71
Treatment	43	21.77	7.39		28	17.61	5.55
Wait-list control	56	19.98	6.97		32	19.56	7.55
GHQ12							
Total Sample	99	13.17	6.30		60	10.69	5.41
Treatment	43	13.77	7.12		28	8.78	5.66
Wait-list control	56	12.71	5.62		32	12.35	4.65
ORWELL							
Total sample	98	54.67	15.25		59	48.39	13.46
Treatment	42	58.63	14.73		28	48.61	14.39
Wait-list control	56	51.70	15.08		31	82.00	12.80

Note. ESRE = the Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress; DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; EESAnF = Emotional Eating Scale -Anger Frustration subscale; EESAnx = Emotional Eating Scale – Anxiety subscale; EESDep = Emotional Eating Scale – Depression subscale; AAQW = Acceptance and Action Questionnaire Weight; AAQII = Acceptance and Action Questionnaire II; CFQ28 = Cognitive Fusion Questionnaire 28 item version; SWLS = Satisfaction with Life Scale; PA = Positive Affect; NA = Negative Affect; GHQ12 = General Health Questionnaire-12; ORWELL = Obesity Related Well-being Questionnaire.

6.5.2 Bivariate correlations for the main standardised variables of interest at

Time 2 post-treatment and difference scores. Pearson's bivariate correlations were extracted for the main standardised variable of interest at Time 2 for total scores and for difference scores, the results are presented in Table 55 - Table 56. All significant correlations were in the expected direction.

6.5.2.1 Time 2 post-treatment bivariate correlations for total scores. Unexpectedly the variable of weight was not significantly correlated to any of the main standardised variables of interest. The correlations between BMI and weight related experiential avoidance, AAQW, and one emotional eating scale, ESRE, trended toward significance at $p < .1$. The correlation between waistline and emotional eating as measured by the ESRE was

the only weight related variable that reached a statistically significant correlation, and emotional eating, EESAnx, trended toward significance with waistline. The correlations between the main standardised variables of interest not including weight are described next.

SWLS was significantly correlated to eight of the variables, six at the $p < .01$ level EESDep and NA at the $p < .05$ level. The DEBQEE, ESRE and EESAnF trended toward significance at the $p < .1$ level, while EESAnx was not significant. GHQ12 was significantly correlated with all twelve variables at $p < .01$, except obesity related well-being at $p < .05$. Positive affect was significantly correlated with all eleven variables $p < .01$ and EESAnx at $p < .05$. Negative affect was significantly correlated with all twelve variables, ten at $p < .01$, with SWLS and EESDep at $p < .05$. Emotional Eating as measured by the DEBQEE was significantly correlated to eleven of the variables at the $p < .01$ level with the correlation with SLWS trending toward significance at the $p < .1$ level. Emotional eating as measured by the ESRE was significantly correlated to eleven of the variables at the $p < .01$ level with the correlation with SLWS trending toward significance at the $p < .1$ level. Emotional eating as measured by the EESAnF was significantly correlated to ten of the variables at the $p < .01$ level, the correlation with AAQII was significant at the $p < .05$ level and with the correlation with SLWS trending toward significance at the $p < .1$ level. Emotional eating as measured by the EESAnx was significantly correlated to nine of the variables at the $p < .01$ level, the correlation with AAQII and PA was significant at the $p < .05$ level and the correlation with SLWS was not significant. Emotional eating as measured by the EESDep was significantly correlated to all twelve variables, ten of the variables at the $p < .01$ level; the correlation with SWLS and NA was significant at the $p < .05$ level. There was a trend toward significance at the $p < .1$ level with waistline. Experiential avoidance as measured by the AAQII was significantly correlated to all twelve variables, ten of the variables at the $p < .01$ and EESAnF and EESDep at the $p < .05$ level. There was a trend toward significance at the $p < .1$ level

with BMI. Experiential avoidance as measured by the AAQW was significantly correlated with all twelve variables at the $p < .01$ level. Obesity related well-being as measured by the ORWELL was significantly correlated with all twelve variables at the $p < .01$ level, except for GHQ12 which was significant at the $p < .05$ level. Cognitive fusion as measured by the CFQ28 correlated with all twelve variables at the $p < .01$ level.

Pearson's Bivariate Correlations for Standardised Variables at Time 2 Post-treatment Scores

	NRW	NRBMI	NRWaist	SWLS	GHQ12	PA	NA	DEBQEE	ESRE	EESAnF	EESAnx	EESDep	AAQII	AAQW	ORWELL	CFQ28
NRW	1.00															
NRBMI	.78**	1.00														
NRWaist	.83**	.74**	1.00													
SWLS	-.00	-.15	-.01	1.00												
GHQ12	-.11	-.11	.02	-.41**	1.00											
PA	-.04	-.13	.08	.56**	-.4.8**	1.00										
NA	.13	.10	.11	-.32*	.50**	-.43**	1.00									
DEBQEE	.14	.10	.19	-.25#	.47**	-.55**	.40**	1.00								
ESRE	-.24#	-.25#	-.21*	.22#	-.36**	.53**	-.38**	-.85**	1.00							
EESAnF	.14	.08	.18	-.22#	.37**	-.47**	.38**	.79**	-.7.4**	1.00						
EESAnx	.19	.12	.23#	-.20	.40**	-.31*	.46**	.68**	-.62**	.80**	1.00					
EESDep	.20	.16	.12	-.28*	.34**	-.40**	.28*	.69**	-.58**	.63**	.56**	1.00				
AAQII	-.07	-.05	-.08	-.58**	.44**	-.56**	.37**	.52**	-.34**	.32*	.32*	.44**	1.00			
AAQW	.17	.24#	.22	-.55**	.40**	-.70**	.46**	.76**	-.7.68**	.66**	.55**	.57**	.57**	1.00		
ORWELL	.09	.11	.10	-.49**	.27*	-.52**	.42**	.57**	-.50**	.49**	.44**	.41**	.55**	.72**	1.00	
CFQ28	-.15	-.03	-.11	-.59**	.51**	-.56**	.47**	.54**	-.37**	.41**	.41**	.45**	.74**	.65**	.57**	1.00

Note. NRW = Nurse report weight; NRBMI = Nurse report Body Mass Index; NRWaist = Nurse report waistline; SWLS = Satisfaction with Life Scale; GHQ12 = General Health Questionnaire-12; PA = Positive Affect; NA = Negative Affect; DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; EESAnF = Emotional Eating Scale -Anger Frustration subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; EESDep = Emotional Eating Scale - Depression subscale; AAQII = Acceptance and Action Questionnaire II; AAQW = Acceptance and Action Questionnaire Weight; ORWELL = Obesity related Well-being Questionnaire; CFQ28 = Cognitive Fusion Questionnaire 28 item version.

*Correlation is significant at the 0.05 level (two-tailed); ** Correlations significant at the 0.01 level (two-tailed); # Correlation trending toward significance at the $p < 0.1$ level. $N = 60$ -59.

Table 56

Pearson's Bivariate Correlations for Standardised Variables Difference Scores

	NRW	NRBMI	NRWasit	SWLS	GHQ12	PA	NA	DEBQEE	ESRE	EESAnF	EESAnx	EESDep	AAQII	AAQW	ORWELL	CFQ28
NRW	1.00															
NRBMI	.55**	1.00														
NRWaist	.36**	.14	1.00													
SWLS	-.10	-.06	.12	1.00												
GHQ12	.15	.05	.03	-.47**	1.00											
PA	-.11	-.07	-.01	.34**	-.38**	1.00										
NA	.39**	.23#	.04	-.22#	.52**	-.34**	1.00									
DEBQEE	.14	.04	.02	-.18	.34**	-.12	.29*	1.00								
ESRE	-.27*	-.06	-.20	.20	-.38**	.25#	-.32*	-.81**	1.00							
EESAnF	.27*	.08	.01	-.21	.20	-.18	.33*	.73**	-.62**	1.00						
EESAnx	.28*	-.02	.02	-.09	.12	.03	.36**	.50**	-.41**	.65**	1.00					
EESDep	.22#	.02	.02	-.38**	.43**	-.23#	.31*	.62**	-.56**	.62**	.50**	1.00				
AAQII	.19	.19	.03	-.39**	.49**	-.38**	.33*	.46**	-.50**	.35**	.13	.45**	1.00			
AAQW	.37**	.22#	.12	-.28*	.32*	-.31*	.35**	.66**	-.76**	.56**	.43**	.44**	.58**	1.00		
ORWELL	.20	.09	.09	-.25	.31*	-.28*	.34**	.61**	-.61**	.39**	.32*	.45**	.33*	.60**	1.00	
CFQ28	.19	.11	.14	-.33**	.43**	-.60**	.46**	.41**	-.60**	.52**	.44**	.51**	.40**	.58**	.49**	1.00

Note. NRW = Nurse report weight; NRBMI = Nurse report Body Mass Index; NRWaist = Nurse report waistline; SWLS = Satisfaction with Life Scale; GHQ12 = General Health Questionnaire-12; PA = Positive Affect; NA = Negative Affect; DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; EESAnF = Emotional Eating Scale -Anger Frustration subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; EESDep = Emotional Eating Scale - Depression subscale; AAQII = Acceptance and Action Questionnaire II; AAQW = Acceptance and Action Questionnaire Weight; ORWELL = Obesity related Well-being Questionnaire; CFQ28 = Cognitive Fusion Questionnaire 28 item version.

*Correlation is significant at the 0.05 level (two-tailed); ** Correlations significant at the 0.01 level (two-tailed); # Correlation trending toward significance at the $p < 0.1$ level. $N = 60$ -59.

6.5.2.2 Bivariate correlations Time 1 – Time 2 difference scores. All significant correlations were in the expected direction. In comparison to the total scores there are a number of significant correlations between the 12 main standardised variable of interest and the weight related variables, of weight, BMI and waistline. The variable of weight is significantly correlated to the AAQW and NA at the $p < .01$ level, and ESRS, EESAnF and EESAnx at the $p < .05$ level, while EESDep shows a trend toward significance at the $p < .1$ level. BMI shows a trend toward significance with the AAQW and NA. There are no significant correlations with waistline. The correlations between the main standardised variables of interest not including weight are highlighted next.

SWLS was significantly correlated with GHQ12, PA, EESDep, AAQII, and CFQ28 at the $p < .01$ level, and the AAQW at the $p < .05$ level. There was a trend with NA at the $p < 0.1$ level. The remaining five variables were not significant. GHQ12 was significantly correlated with SWLS, PA, NA, DEBQEE, ESRE, EESDep, AAQII and CFQ28 at the $p < .01$ level, and AAQW and ORWELL at the $p < .05$ level. PA was significantly correlated with SWLS, GHQ12, NA, AAQII, CFQ28 at the $p < .01$ level, AAQW and ORWELL at the $p < .05$ level, and showed a trend toward significance with ERSE and EESDep. NA was significantly correlated with eleven of the twelve variables, GHQ12, PA, EESAnx, AAQW, ORWELL and the CFQ28 at the $p < .01$ level, DEBQEE, ERSE, EESAnF, EESDep and AAQII at the $p < .05$ level, and SWLS showed a trend toward significance at the $p < .1$ level. The DEBQEE was significantly correlated with ten of the twelve variables, GHQ12, ERSE, EESAnF, EESAnx, EESDep, AAQII, AAQW, ORWELL, CFQ28 at the $p < .01$ level, and the NA was at the $p < .05$ level. SWLS and PA were not significant. The ESRE was significantly correlated with ten of the twelve variables, the GHQ12, DEBQEE, EESAnF, EESAnx, EESDep, AAQII, AAQW, ORWELL, CFQ28 at the $p < .01$ level, and the NA was at the $p < .05$ level. PA trended toward significance at the $p < .1$ level while SWLS was not

significant. The EESAnF was significantly correlated with nine of the twelve variables, the DEBQEE, ESRE, EESAnx, EESDep, AAQII, AAQW, ORWELL, CFQ28 were at the $p < .01$ level, and NA was at the $p < .05$ level. SWLS, GHQ12, and PA were not significant. The EESAnx was significantly correlated with eight of the twelve variables, NA, DEBQEE, ESRE, EESAnF, EESDep, AAQW, CFQ28 at the $p < .01$ level, with the ORWELL at the $p < .05$ level. AAQII, SWLS, GHQ12, and PA were not significant. The EESDep was significantly correlated with eleven of the twelve variables, ten were significant at the $p < .01$ level, with NA at the $p < .05$ level. PA trended toward significance at the $p < .1$ level. The AAQII was significantly correlated with eleven of the twelve variables, with ten at the $p < .01$ level, and NA at the $p < .05$ level, with EESAnx not significant. The AAQW was significantly correlated with all twelve variables, nine were at the $p < .01$ level with SWLS, GHQ12, and PA at the $p < .05$ level. The ORWELL was significantly correlated with all twelve variables except SWLS, nine were at the $p < .01$ level with two, the GHQ12 and PA, at the $p < .05$ level. The CFQ12 was significantly correlated with all twelve variables at the $p < .01$ level.

6.5.3 Participant categorisation on weight maintenance or weight gain status at Time 2 Post-treatment. Participants were categorised into weight status at Time 2 in relation to Time 1. The categories were either ‘maintained’ or ‘gained’ weight, using St Jeor et al.’s (1997) weight maintenance study guidelines which Lillis et al. (2009) also used. Participants whose weight increased by more than 2.3kgs were classified as gaining weight, participants whose weight did not increase by 2.3kgs were classified as maintaining weight. Results are presented in Table 57, and shown in Figure 4.

Table 57

Participant Categorisation on Weight Maintenance or Weight Gain Status at Time 2 Post-treatment (N = 60)

	Maintained		Gained	
	Number	%	Number	%
Treatment (n = 28)	27	96%	1	4%
Wait-list control (n = 32)	24	75%	8	25%

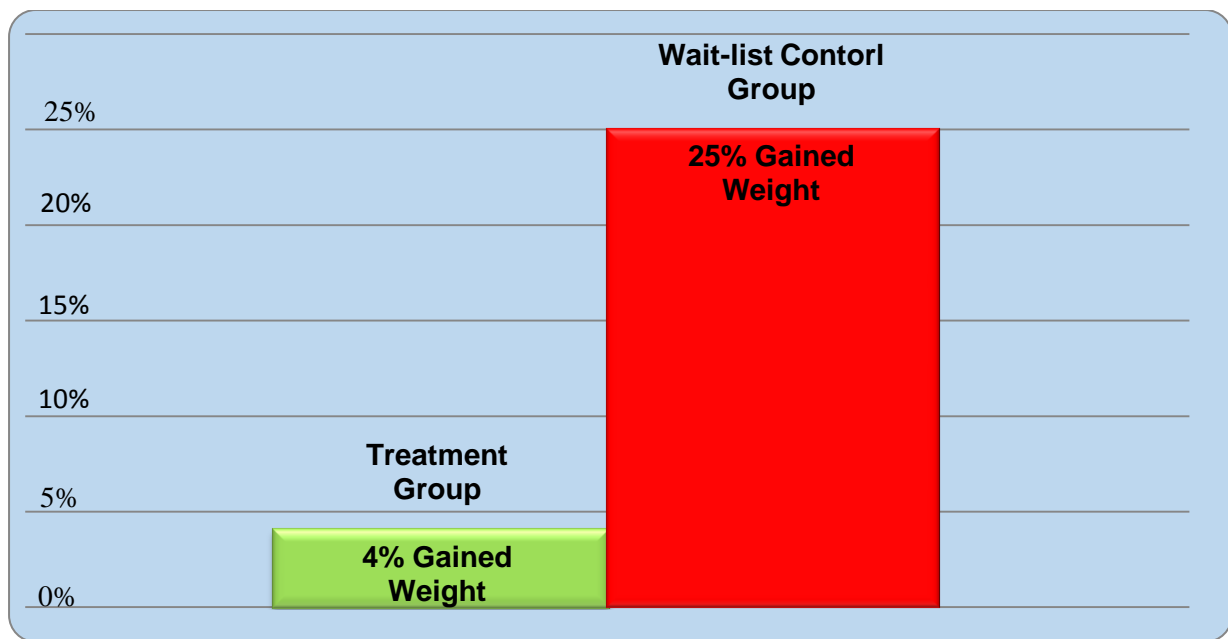


Figure 4. Percentage of participants who gained weight in each group.

6.5.4 The effect of the ACT treatment on weight gain or maintenance status. A chi-square analysis was performed to examine the effect of the 1-day ACTing on Weight group workshop treatment on weight gain or maintenance status. The aim of this was to establish if participants were significantly more likely to be characterised as maintaining weight and significantly less likely to be characterised as gaining weight after the 1-day ACTing on Weight group workshop treatment. The chi square results showed that the lowest expected frequency in cells had been violated rendering an interpretation of Pearson's Chi-Square inappropriate. In cases such as this, Fisher's Exact Probability Test is recommended.

The result of the Fisher's Exact Probability Tests show that participants who attended the 1-day ACTing on Weight group workshop were significantly more likely to be characterised as maintaining weight, and significantly less likely to be characterised as gaining weight, $p = .03$. To help interpret the treatment effect McGough and Faraone (2009) suggest calculating the Relative Risk to show the magnitude of the effect. The relative risk calculation is the probability of people improving due to treatment exposure over the probability of people improving without treatment exposure. Using Lynch's (2013) calculation instructions, relative risk was calculated to be .14. This means that the incidence of gaining weight if one attended the ACTing on weight 1-day workshop is lower by 14%, than if they did not attend the workshop. The ACTing on Weight 1-day workshop is protection against gaining weight.

6.5.5 Discriminant function analysis for the main standardised variables of Interest at Time 2. A discriminate function analysis was conducted to uncover the dimensions of values that may differentiate the treatment group from the wait-list control group. The values included were the main standardised variables of interest as outlined above in Table 50. One function was extracted and it did reach significance Wilks' Lambda = 0.51 $\chi^2(16) = 32.01, p = .01$. This indicates that the two groups vary on one distinct facet or dimension post-treatment or after the 1-day ACTing on Weight group workshop treatment. The structure matrix and group centroids for the function are presented in Tables 58 and 59 respectively. According to the structure matrix, the function that has been extracted primarily represents three emotional eating variables, suggesting the function can be conceptualised as 'Emotional Eating'. The group centroids suggest this function, and thus Emotional Eating, tends to be better managed by the treatment group members and less likely to be managed well by the wait-list control group members.

Table 58

Structure Matrix that Emerged from the Discriminant Function Analysis at Time 2 Post-treatment (N = 57)

Variable	Function 1
EESAnF	-.45
ESRE	.44
DEBQEE	-.41
GHQ12	-.34
EESDep	-.26
EESAnx	-.24
PA	.22
NRWaist	-.13
AAQW	-.13
CFQ28	-.12
NA	-.12
SWLS	.05
NRBMI	-.04
AAQII	.03
ORWELL	.01
NRWeight	-.00

Note. Factor loadings >.4 are in boldface

EESAnF = Emotional Eating Scale -Anger Frustration subscale; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; GHQ12 = General Health Questionnaire-12; EESDep = Emotional Eating Scale - Depression subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; PA = Positive Affect; NRWaist = Nurse report waistline; AAQW = Acceptance and Action Questionnaire for Weight; CFQ28 = Cognitive Fusion Questionnaire 28 item version; NA = Negative Affect; SWLS = Satisfaction with Life Scale; NRBMI = Nurse report Body Mass Index; AAQII = Acceptance and Action Questionnaire II; ORWELL = Obesity related Well-being Questionnaire; NRW = Nurse report weight.

Table 59

Group Centroids that Emerged from the Discriminant Function Analysis (N = 57)

Group	Function 1
Treatment (n = 28)	.99
Wait-list control (n = 29)	-.95

6.5.6 Multivariate analysis of between-group differences pre and post-

treatment Time 1-Time 2. Overall, the outcome variable of central interest to the research aims is the weight in kilograms variable. As such the first analysis performed was a

one-way between-groups analysis of covariance (ANCOVA) to determine the difference between the treatment group and the wait-list control group on weight comparing Time 1 with Time 2. Following this two more ANCOVAs were preformed, one each for BMI and waistline.

6.5.6.1 Analysis of covariance for weight. A one-way between groups analysis of covariance (ANCOVA) was conducted to compare the effectiveness of the 1-day ACTing on Weight group workshop compared to the wait-list control for weight. The independent variable was the treatment and the dependant variable was weight as measured at Time 2 post-treatment. Participant weight at Time 1 pre-treatment was used as the covariate in this analysis. After adjusting for pre-treatment scores, there was a significant difference between the two groups on post-treatment scores on weight in kilograms $F = (1, 57) = 4.25, p = .04$, partial eta squared = .07. Descriptive statistics are presented in Table 60.

Table 60

Descriptive Statistics for Weight in Kilograms Pre and Post-treatment

	Time 1		Time 2			
	Mean	SD	Mean	SD	Adjusted Mean	Standard error
Treatment	84.07 (<i>n</i> = 43)	21.30	79.18 (<i>n</i> = 28)	10.51	78.56	.47
Wait-list control	78.23 (<i>n</i> = 56)	17.93	79.35 (<i>n</i> = 32)	14.43	79.90	.44

6.5.6.2 Analysis of covariance for BMI. A one-way between groups analysis of covariance (ANCOVA) was conducted to compare the effectiveness of the 1-day ACTing on Weight group workshop compared to the wait-list control for BMI. The independent variable was the treatment and the dependant variable was BMI as measured at Time 2 post-treatment. Participant BMI at Time 1 pre-treatment was used as the covariate in this analysis. After adjusting for pre-treatment scores, there was no significant difference between the two groups

on post-treatment scores on BMI $F = (1, 57) = 0.29, p = .59$, partial eta squared = 0.01.

Descriptive statistics are presented in Table 61.

Table 61

Descriptive Statistics for BMI Pre and Post-treatment

	Time 1		Time 2			
	Mean	SD	Mean	SD	Adjusted Mean	Standard error
Treatment	31.35 (<i>n</i> = 43)	8.58	29.25 (<i>n</i> = 28)	4.67	29.33	.40
Wait-list control	29.15 (<i>n</i> = 56)	5.31	29.70 (<i>n</i> = 32)	4.71	29.63	.38

6.5.6.3 Analysis of Covariance for Waistline. A one-way between-groups analysis of covariance (ANCOVA) was conducted to compare the effectiveness of the 1-day ACTing on Weight group workshop compared to the wait-list control for waistline. The independent variable was the treatment and the dependent variable was waistline as measured at Time 2 post-treatment. Participant waistline at Time 1 pre-treatment was used as the covariate in this analysis. After adjusting for pre-treatment scores, there was no significant difference between the two groups on post-treatment scores on Waistline $F = (1, 57) = 1.08, p = .30$, partial eta squared = 0.02. Descriptive statistics are presented in Table 62.

Table 62

Descriptive Statistics for Waistline Pre and Post-treatment

	Time 1		Time 2			
	Mean	SD	Mean	SD	Adjusted Mean	Standard error
Treatment	101.21 (<i>n</i> = 43)	16.29	95.34 (<i>n</i> = 28)	7.85	96.57	.77
Wait-list control	98.19 (<i>n</i> = 56)	14.06	98.73 (<i>n</i> = 32)	11.11	97.66	.72

6.5.6.4 Multivariate analysis of variance for the main standardised variables of interest post-treatment Time 2. Once significant differences were explored for the weight variables, a series of MANOVAs were performed to determine the significance of differences between the treatment group and the wait-list control group on the remaining main standardised variables of interest. Difference scores were computed, Time 1 - Time 2, for use in the MANVOAs. In total three MANOVAs were performed, one Emotional Eating scale was entered in each MANOVA along with the following main standardised variables of interest: AAQW, AAQII, CFQ28, SWLS, PA, NA, GHQ12 and ORWELL.

When the ESRE was entered the MANOVA yielded a significant result $F(9, 48) = 4.33, p < .01$; Wilks' Lambda = 0.55; partial eta squared = 0.45. When the results for the dependant variables were considered separately, six of the nine variables reached statistical significance with alpha levels $p < 0.01$. They were GHQ12, NA, ESRE, AAWQ, and the ORWELL. Not reaching statistical significance were the AAQII, PA and SWLS. See Table 63 for F values, p values, and partial eta squared values.

Table 63

ESRE MANOVA Results for Main Standardised Variables of Interest

	$F(1, 56)$	p	Partial eta squared
AAQW	14.61	<.01	.21
AAQII	2.21	.14	.04
CFQ28	10.63	<.01	.16
SWLS	0.21	.65	.01
PA	0.63	.43	.01
NA	14.21	<.01	.20
GHQ12	8.78	<.01	.14
ORWELL	7.36	.01	.12
ESRE	22.32	<.01	.29

Note: AAQW = Acceptance and Action Questionnaire for Weight; AAQII = Acceptance and Action Questionnaire II; CFQ28 = Cognitive Fusion Questionnaire 28 item version; SWLS = Satisfaction with Life Scale; PA = Positive Affect; NA = Negative Affect; GHQ12 = General Health Questionnaire-12; ORWELL = Obesity related Well-being Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale.

When the DEBQEE was entered the MANOVA yielded a significant result $F(9, 46) = 3.96, p < .01$; Wilks' Lambda = 0.56; partial eta squared = 0.44. When the results for the dependent variables were considered separately, six of the nine variables reached statistical significance at $p < .01$. They were GHQ12, NA, DEBQEE, AAQW, ORWELL, CFQ28. Not reaching statistical significance were the AAQII, PA and SWLS. See Table 64 for F values, p values, and partial eta squared values.

Table 64

DEBQEE MANOVA Results for Main Standardised Variables of Interest

	$F(1, 56)$	p	Partial eta squared
AAQW	12.83	<.01	.19
AAQII	1.95	.17	.04
CFQ28	11.61	<.01	.18
SWLS	0.32	.57	.01
PA	0.70	.41	.01
NA	14.52	<.01	.21
GHQ12	9.34	<.01	.15
ORWELL	8.57	<.01	.14
DEBQEE	16.21	<.01	.23

Note: AAQW = Acceptance and Action Questionnaire for Weight; AAQII = Acceptance and Action Questionnaire II; CFQ28 = Cognitive Fusion Questionnaire 28 item version; SWLS = Satisfaction with Life Scale; PA = Positive Affect; NA = Negative Affect; GHQ12 = General Health Questionnaire-12; ORWELL = Obesity related Well-being Questionnaire; DEBQE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire.

When the EES subscales were entered the MANOVA yielded a significant result $F(11, 44) = 2.87, p < .01$; Wilks' Lambda = 0.58; partial eta squared = .418. When the results for the dependant variables were considered separately, eight of the eleven variables reached statistical significance at $p < .01$. They were GHQ12, NA, EESAnF, EESAnx, EESDep, AAQW, ORWELL, CFQ28. Not reaching statistical significance were AAQII, PA and SWLS. See Table 65 for F values, p values, and partial eta squared values.

Table 65

EES MANOVA Results for Main Standardised Variables of Interest

	<i>F</i> (1, 56)	<i>p</i>	Partial eta squared
AAQW	13.39	<.01	.20
AAQII	2.01	.162	.04
CFQ28	10.29	<.01	.16
SWLS	0.10	.76	.01
PA	0.10	.77	.01
NA	11.89	<.01	.18
GHQ12	7.66	<.01	.12
ORWELL	6.72	.01	.11
EESAng	11.81	<.01	.18
EESAnx	9.48	<.01	.15
EESDep	8.51	<.01	.14

Note: AAQW = Acceptance and Action Questionnaire for Weight; AAQII = Acceptance and Action Questionnaire II; CFQ28 = Cognitive Fusion Questionnaire 28 item version; SWLS = Satisfaction with Life Scale; PA = Positive Affect; NA = Negative Affect; GHQ12 = General Health Questionnaire-12; ORWELL = Obesity related Well-being Questionnaire; DEBQE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; EESAnF = Emotional Eating Scale - Anger Frustration subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; EESDep = Emotional Eating Scale - Depression subscale.

6.5.6.5 Exploring possible effects of demographic variables. After the MANOVAs were conducted backward multiple regression analysis was carried out to examine the possible effects of demographic variables on changes in criterion variables for the treatment group in case any such effects needed to be taken into account in examining the effects of the treatment through covariance analysis, where MANCOVAs (Multivariate Analysis of Covariance) may need to be employed instead of MANOVAs. This analysis was conducted on variables where the MANOVA had been found to be significant. The demographic variables included in the analysis were relationship status, number of children, education level, current employment and household income. No significant models were found, and thus additional MANCOVAs were deemed unnecessary. The results were: ESRE: was $F(5, 22) = .61, p = .69$; DEBQEE: $F(5, 21) = 1.28, p = .31$; EESAnF: $F(5, 21) = 1.36, p = .28$; EESAnx: $F(5, 12) = 1.46, p = .24$; EESDep: $F(5, 22) = .87, p = .52$.

6.6 Summary of Results for Post-treatment Differences Between the Treatment Group and Wait-list Control Group at Time 2

To summarise, the results showed that participants who attended the 1-day ACTing on Weight group workshop were significantly more likely to be characterised as maintaining weight, and significantly less likely to be characterised as gaining weight. Of the participants in the wait-list control group 25% of them gained weight as opposed to 4% in the treatment group. The discriminant function analysis concurred with this result suggesting that emotional eating tends to be better managed by those in the treatment group and less likely to be managed well by those in the wait-list control group. ANCOVA analyses showed that there was a significant difference between the treatment group and the wait-list control group on weight, with the treatment group yielding lower weight measurements. Conversely, there was no difference found between the groups on waistline and BMI. Three MANOVA analyses were performed, one for each emotional eating scale, along with the other main standardised variables of interest. Each MANOVA showed significant differences between the groups on the same variables which were all three of the emotional eating scales and the AAQW, the CFQ28, NA, the GHQ12 and the ORWELL. On each of these variables participants who attended the ACTing on Weight group workshop improved their scores on each scale, while the control group's scores remained steady at best or showed changes in the adverse direction. In each MANOVA the same three variables did not reach significance; they were the AAQII, PA and the SWLS.

6.7 Mediation Approach and Results

6.7.1 Mediation approach: Ordinary Least Squares Path Analysis.

As previously stated, mediation analysis is a statistical technique that illuminates *how* a causal variable *X* effects the outcome variable *Y*. The *how* variable is the mediator variable *M*. “A simple mediation model is any causal system in which at least one causal antecedent *X*

variable is proposed as influencing an outcome Y through a single intervening variable M ”

(A. Hayes, 2013, p. 86). See Figure 5A for a conceptual diagram for X ’s total effect on Y , and 5B for a conceptual diagram of a simple mediation model.

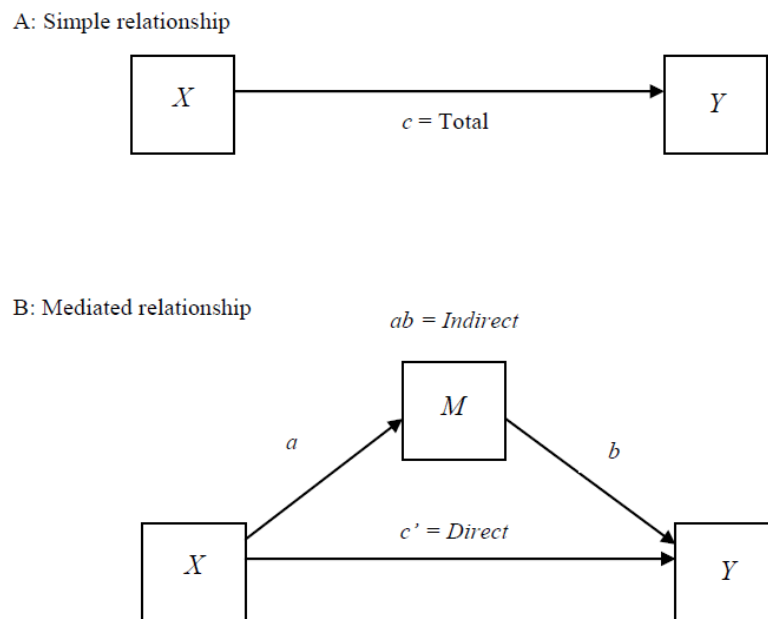


Figure 5. Conceptual diagram of a simple mediation model, copied from A. Hayes (2009, p. 409).

As can be seen from Figure 5A, without the mediating variable ‘ M ’ included c denotes X ’s *total effect* on Y ” (A. Hayes, 2009, p.408). In this total effect model however, there may be effects of another/other variables not accounted for. Mediation analysis aims to uncover such hidden effects. In mediation analysis there are various pathways in which variable X can transmit its effect on the outcome variable Y (A. Hayes, 2013). The first pathway is known as the ‘*direct effect*’ and is denoted by the symbol c' . “The direct effect estimates the effect of X on Y independent of M (A. Hayes, 2013, p. 124). The second pathway is called the ‘*indirect effect*’ and is denoted by the symbols a and b as there are two parts to this pathway which encapsulates the influence of the intervening mediating variable M . Path a “estimates the total effect of X on M and the b path estimates the total effect of M

on Y controlling for X ” (A. Hayes, 2013, p.124). The indirect effect is the product of a and b ‘ ab ’, and estimates the effect of X on Y *through* M . “The indirect effect tells us that two cases that differ by one unit on X are estimated to differ by ab unit on Y as a result of the effect of X on M which, in turn, affects Y ” (A. Hayes, 2013, p. 92). More specifically, “the indirect effect is the difference between the total effect of X and Y and the effect of X on Y controlling for M , the direct effect” (A. Hayes, 2013, p. 93). The sum of the direct effect (c') and indirect effect (ab) is the total effect (c) and “the sum of the direct and indirect effect qualifies how much two cases that differ by a unit on X are estimated to differ on Y ” (A. Hayes, 2013, p.93). In summary, the mediation model comprises direct (c'), indirect (ab) and total effects (c), and mathematically it is represented like this: $c = c' + ab$ OR $ab = c - c'$ (A. Hayes, 2013, p. 93). It is noteworthy that in the Ordinary Least Squares path analysis that “ X can exert an indirect effect on Y through M in the absence of an association between X and Y ” (A. Hayes, 2009, p. 414).

Although the direct and total effects in this model are interesting, it is the statistical significance of the indirect effect that researchers conducting mediations analysis are most interested in (Field, 2013). This is because despite what might appear to be a statistically significant relationship between X and Y , the significance of this relationship may in fact be being transmitted through M , that is “The indirect effect is relevant as to whether X ’s effect on Y can be said to be transmitted through the mechanism represent by the $X > M > Y$ causal chain of events” (A. Hayes, 2013, p. 102). If a statistically significant result is extracted for the indirect effect the researcher can claim that M “serves as a mediator of the effect of X on Y ” (A. Hayes, 2013, p.102). In mediation analysis the aim is to find situations where “ X does not affect Y independent of M ’s effect on Y ” (A. Hayes, 2013, p. 101). In other words “one can claim that there is no evidence of association between X and Y when the mechanism through M is accounted for” (A. Hayes, 2013, p. 101).

As with most inferential statistical tests there are several options to choose from to analyse data, and there are several options that can be used to explore indirect effects in mediation analysis. It is beyond the scope of this paper to delve into the depths of the multiple benefits and limitations of these options, for an in depth discussion see A. Hayes (2013). Professor Andrew F. Hayes, Ph.D., is currently one of the leading experts in the methodological implications of all the options available. He recently authored a seminal text outlining the benefits and limitations of the various options (A. Hayes, 2013) and has published other relevant papers that discuss mediation analysis options (e.g. A. Hayes, 2009). His recommendations are the basis for choosing to use the Ordinary Least Squares (OLS) path analysis for mediation for the current analyses, rather than the most-often-used Baron and Kenny approach and Sobel test that have dominated publication using mediation for a long time (Baron & Kenny, 1986; A. Hayes, 2013; Field, 2013). After weighing up all the benefits and limitations A. Hayes recommends using the OLS path analysis with the bias-corrected bootstrap confidence interval option which “has become the more widely recommended method for inference about the indirect effect in mediation analysis” (A. Hayes, 2013, p. 116). Others also recommend this option (e.g. Field, 2013). The main reason that this approach is recommended is that it balances power and validity well, and has no assumptions about the shape, or the lack of a normal shape curve, of the distribution of the indirect effect. Briefly, bootstrapping is a resampling method that mimics the original sampling process and generally 10,000 is the standard resampling amount. The bootstrapping generates an “empirically derived representation of the sampling distribution of the indirect effect and this empirical representation is used for the construction of a confidence interval” (A. Hayes, 2013, p. 110). It is these confidence intervals that reveal the significance of the indirect effect. If the confidence interval includes (that is straddles) zero, the indirect effect is not significant. If the confidence interval does not include zero the researcher can say that

there is a significant indirect effect or that “*M* is a mediator of the relationship between *X* > *Y*” (Field, 2013, p. 416).

The OLS path analysis bias-corrected bootstrap confidence interval approach was executed through Professor A. Hayes’ readily available computational tool called “PROCESS”. PROCESS was developed by Professor A. Hayes, and is made freely available on his website (www.afhayes.com). PROCESS is described as a “computational tool for path analysis-based moderation and mediation...that generates direct and indirect effects in mediation models” (A. Hayes, 2013, p. 419). PROCESS can be used with SPSS software. For simple mediation which was used in this research the output PROCESS provides includes estimates of total, direct and indirect effects. It generates a bias-corrected 95% bootstrap confidence interval for the indirect effect using 10, 000 bootstrap samples, produces point estimate and bias corrected 95% bootstrap confidence interval estimates of various indices of effect size for the indirect effect (A. Hayes, 2013).

6.7.2 Mediation Results. Mediation analyses were assessed using the OLS bias-corrected bootstrap confidence interval approach (A. Hayes, 2013). Mediation analyses were conducted on pre- to post-treatment change scores. Three sets of mediation analyses were conducted. In each set of analyses the independent variable (*X*) was treatment condition or group or wait-list control group. The dependent variables (*Y*) were the weight related variables and the other main standardised variables of interest. Each of the three sets of analyses contained a different mediator variables. Firstly, the AAQW was explored as a mediator; secondly the AAQII was explored as a mediator; and thirdly the CFQ28 was explored as a mediator. In the reporting of the results A. Hayes (2013) and Field (2013) both suggest using the words “indirectly influenced”(A. Hayes, 2013, p. 199), for example, *X* indirectly influenced *Y* through its effect on *M*. This is instead of using the terms mediated/full mediated/partially mediated. This approach has been adopted for the reporting

of these results, and at the same time the term mediation has also been used due to its broadly understood meaning by researchers. Please note that the symbol b is the symbol for unstandardised regression coefficient or *beta* which can also be found in simple regression models ($y = a + bx$); there is also *Path b* in the regression model as discussed earlier and demonstrated in Figure 5. In the next three sub-sections detailed results of the mediation analyses are presented, and following in Table 64 a summary of the indirect effects is provided.

6.7.2.1 Mediation analysis for AAQW as a mediator. The first set of mediation analysis was conducted with AAQW as the mediator (M), group as the predictor (X) and the main standardised variables of interest including emotional eating as the outcome measures (Y). The results are presented beginning with the weight related variables, followed by the emotional eating scales and followed by the subsidiary variables of interest. Overall, experiential avoidance as measured by the AAQW (M) serves as a mediator of the effect of the 1-day ACTing on weight workshop/group (X) on 10 of the 13 outcomes (Y) including weight, BMI, all 5 emotional eating scales, satisfaction with life, positive affect and obesity related well-being.

(1) *Mediation analysis for group (X) > AAQW (M) > weight in kilograms (Y).* There was a significant indirect effect of group (X) on weight (Y) through experiential avoidance as measured by the AAQW $b = 0.75$, BCa CI [.15, 1.74], where b is the symbol for unstandardised regression coefficient which can also be found in simple regression models. This represents a medium to large effect, $k^2 = .14$, 95% BCa CI [.03, .27]. The direct effect was $c' = 0.62$, $t(57) = .87$, $p = .39$, 95% BCa CI [-0.80, 2.04]. The total effect was $c = 1.37$, $t(58) = 2.11$, $p = .04$, 95% BCa CI [.07, 2.67].

Notice that the indirect effect does not straddle zero. When the indirect effect is different from zero the claim can be made that “ M serves as a mediator of the effect of X on

Y' (A. Hayes, 2013, p. 102). In addition the result shows that the direct effect does straddle zero; this shows that “there is no evidence of association between X and Y when the mechanism through M is accounted for” (A. Hayes, 2013, p. 101). To interpret the results correctly recall that the treatment/treatment group is coded = 1 and the wait-list control group is coded = 2, and that higher scores on the AAQW mean more experiential avoidance and that on all the emotional eating scales higher scores mean higher emotional eating except on the ESRE where lower scores mean higher emotional eating. With that in mind the results show that the 1-day ACTing on Weight group workshop indirectly influenced weight through experiential avoidance as measured by the AAQW. As can be seen in Figure 6, those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.93$), and those who were higher on AAQW were also higher on weight ($b = .05$). A bias-corrected bootstrap confidence interval for the indirect effect ($ab = 0.75$) based on 10,000 bootstrap samples was entirely above zero (0.15, 1.74). There was no evidence that the 1-day ACTing on Weight group workshop influenced weight independent of its effect on experiential avoidance ($c' = 0.62, p = .39$). In summary, experiential avoidance as measured by the AAQW serves as a mediator of the effect of group on weight in kilograms. Figure 6 shows these results in the context of the conceptual diagram.

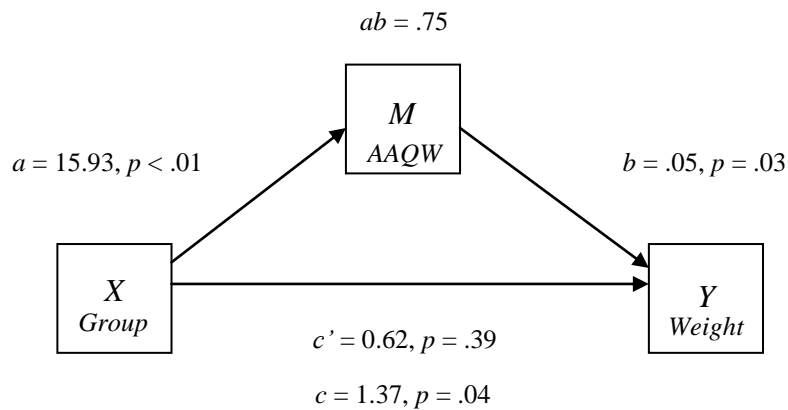


Figure 6. Conceptual diagram of the mediation model for group > AAQW > Weight in Kilograms. Adapted from A. Hayes (2013, p. 118)

(2) *Mediation analysis for group (X) > AAQW (M) > waistline (Y).* There was not a significant indirect effect of group (X) on waistline (Y) through experiential avoidance (M) as measured by the AAQW $b = 0.46$, BCa CI [-.856, 1.77]. The direct effect was $c' = .18$, $t(58) = .14$, $p = .89$, 95% BCa CI [-2.40, 2.75]. The total effect was $c = .63$, $t(56) = .56$, $p = .58$, 95% BCa CI [-1.63, 2.90].

(3) *Mediation analysis for group (X) > AAQW (M) > BMI (Y).* There was a significant indirect effect of group (X) on BMI (Y) through experiential avoidance (M) as measured by the AAQW $b = 0.48$, BCa CI [.06, 1.30]. This represents a small effect, $k^2 = .10$, 95% BCa CI [.01, .20]. The direct effect was $c' = -.20$, $t(56) = -.32$, $p = .75$, 95% BCa CI [-1.44, 1.05]. The total effect was $c = .28$, $t(56) = .51$, $p = .62$, 95% BCa CI [-.834, 1.40]. Path a was $b = 15.93$, $p < .01$, and Path b was $b = .03$, $p = .10$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced BMI by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on experiential

avoidance as measured by the AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.93$), and those who were higher on AAQW were also higher on BMI ($b = .030$). There was no evidence that the 1-day ACTing on Weight group workshop influenced BMI independent of its effect on experiential avoidance ($c' = -.20, p = .75$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on BMI.

(4) *Mediation analysis for group (X) > AAQW (M) > DEBQEE (Y)*. There was a significant indirect effect of group (X) on emotional eating (Y) as measured by the DEBQEE through experiential avoidance (M) as measured by the AAQW $b = 0.34$, BCa CI [.11, .67]. This represents a large effect, $k^2 = .27$, 95% BCa CI [.10, .42]. The direct effect was $c' = 0.27, t(56) = 1.89, p = .07$, 95% BCa CI [-.02, .56]. The total effect was $c = .61, t(56) = 3.92, p < .01$, 95% BCa CI [.30, .92]. Path a was $b = 15.27, p < .01$, and Path b was $b = .02, p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly decreased emotional eating by decreasing experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.27$), and those who were higher on AAQW were also higher on emotional eating ($b = .02$). There was no evidence that the 1-day ACT group workshop influenced emotional eating independent of its effect on experiential avoidance ($c' = .27, p = .07$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on emotional eating as measured by the DEBQEE.

(5) *Mediation analysis for group (X) > AAQW (M) > ESRE (Y)*. There was a significant indirect (ab) effect of group (X) on emotional eating (Y) as measured by the ESRE through experiential avoidance (M) as measured by the AAQW $b = -7.42$, BCa CI [-13.37, -3.34]. This represents a large effect, $k^2 = .34$, 95% BCa CI [.17, .48]. The direct effect was $c' = -5.47, t(58) = -2.44, p = .02$, 95% BCa CI [-9.97, -.98]. The total effect was $c = -12.89, t$

(58) = -4.79, $p < .01$, 95% BCa CI [-18.28, -7.50]. Path a was $b = 15.93$, $p < .01$, and Path b was $b = -.46$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.93$), and those who were higher on AAQW were also higher on emotional eating as measured by the ESRE which is interpreted as lower scores mean high emotional eating ($b = -.47$). Despite this significant indirect effect, there is evidence that there is still a significant relationship between the 1-day ACTing on Weight group workshop and emotional eating independent of experiential avoidance as measured by the ESRE ($c' = -5.47$, $p = .02$); that is, when experiential avoidance is controlled the relationship between group and emotional eating is significant. In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on emotional eating as measured by the ESRE; however there is still variance to be explained as the total relationship between group and ESRE remained significant.

(6) *Mediation analysis for group (X) > AAQW (M) > EESAnF (Y)*. There was a significant indirect effect of group (X) on emotional eating (Y) as measured by the EESAnF through experiential avoidance (M) as measured by the AAQW $b = 3.56$, BCa CI [1.28, 6.98]. This represents a large effect, $k^2 = .21$, 95% BCa CI [.09, .34]. The direct effect was $c' = 3.53$, $t(56) = .171$, $p = .09$, 95% BCa CI [-.62, 7.67]. The total effect was $c = 7.10$, $t(58) = 3.48$, $p < .01$, 95% BCa CI [3.01, 11.18]. Path a was $b = 15.80$, $p < .01$ and Path b was $b = .23$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.80$), and those who were higher on AAQW were also higher on emotional eating ($b = .23$). There was no evidence that

the 1-day ACT group workshop influenced emotional eating independent of its effect on experiential avoidance ($c' = 3.53, p = .09$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on emotional eating as measured by the EESAnF.

(7) *Mediation analysis for group (X) > AAQW (M) > EESAnx (Y)*. There was a significant indirect effect of Group (X) on emotional eating (Y) as measured by the EESAnx through experiential avoidance (M) as measured by the AAQW $b = 1.66$, BCa CI [.43, 3.46]. This represents a large effect, $k^2 = .15$, 95% BCa CI [.037, .282]. The direct effect was $c' = 2.22, t(56) = 1.52, p = .14$, 95% BCa CI [-.71, 5.14]. The total effect was $c = 3.88, t(56) = 2.86, p < .01$ 95% BCa CI [1.16, 6.59]. Path a was $b = 15.80, p < .01$, and Path b was $b = .11, p = .02$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.80$), and those who were higher on AAQW were also higher on emotional eating ($b = .11$). There was no evidence that the 1-day ACTing on Weight group workshop influenced emotional eating independent of its effect on experiential avoidance ($c' = 2.22, p = .14$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on emotional eating as measured by the EESAnx.

(8) *Mediation analysis for group (X) > AAQW (M) > EESDep (Y)*. There was a significant indirect effect of group (X) on emotional eating (Y) as measured by the EESDep through experiential avoidance (M) as measured by the AAQW $b = 1.23$, BCa CI [.22, 2.83]. This represents a large effect, $k^2 = .16$, 95% BCa CI [.035, .316]. The direct effect was $c' = 1.17, t(56) = 1.19, p = .24$, 95% BCa CI [-0.81, 3.14]. The total effect was $c = 2.40, t(56) = 2.60, p = .01$, 95% BCa CI [.55, 4.25]. Path a was $b = 15.80, p < .001$, and Path b was $b = .08$,

$p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 15.80$), and those who were higher on AAQW were also higher on emotional eating ($b = .08$). There was no evidence that the 1-day ACT group workshop influenced emotional eating independent of its effect on experiential avoidance ($c' = 1.17, p = .24$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on emotional eating as measured by the EESDep.

(9) *Mediation analysis for group (X) > AAQW (M) > SWLS (Y)*. There was a significant indirect effect of Group (X) on SWLS (Y) through experiential avoidance (M) as measured by the AAQW $b = -1.35$, BCa CI [-3.25, -.09]. This represents a medium to large effect, $k^2 = .14$, 95% BCa CI [.02, .29]. The direct effect was $c' = .81, t(58) = .62, p = .54$, 95% BCa CI [-1.81, 3.42]. The total effect was $c = -.55, t(58) = -4.57, p = .65$ 95% BCa CI [-2.93, 1.842]. Path a was $b = 15.93, p < .001$, and Path b was $b = -.085, p = .03$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced SWLS by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on experiential avoidance than those who attended the 1-day ACTing on Weight group workshop ($a = 15.93$), and those who were higher on AAQW were lower on SWLS ($b = -.09$). There was no evidence that the 1-day ACTing on Weight group workshop influenced independent of its effect on experiential avoidance ($c' = .81, p = .54$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on satisfaction with life as measured by the SWLS.

(10) *Mediation analysis for group (X) > AAQW (M) > GHQ12 (Y)*. There was not a significant indirect effect of group (X) on GHQ12 (Y) through experiential avoidance (M) as

measured by the AAQW $b = .10$, BCa CI $[-.43, 3.10]$. The direct effect was $c' = 3.84$, $t(58) = 2.26$, $p = .03$, 95% BCa CI $[.44, 7.24]$. The total effect was $c = 4.84$, $t(58) = 3.21$, $p < .01$, 95% BCa CI $[1.82, 7.85]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to GHQ12 independent of AAQW, with people in the wait-list control group reporting more ill health.

(11) *Mediation analysis for group (X) > AAQW (M) > PA (Y)*. There was a significant indirect effect of group (X) on PA (Y) through experiential avoidance (M) as measured by the AAQW $b = -1.82$, BCa CI $[-4.05, -.39]$. This represents a medium to large effect, $k^2 = .14$, 95% BCa CI $[.03, .28]$. The direct effect was $c' = .11$, $t(58) = .06$, $p = .92$, 95% BCa CI $[-3.39, 3.60]$. The total effect was $c = -1.72$, $t(58) = -1.08$, $p = .29$, 95% BCa CI $[-4.91, 1.48]$. Path a was $b = 15.93$, $p < .001$, and Path b was $b = -.11$, $p = .03$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced PA by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on experiential avoidance than those who attended the 1-day ACTing on Weight group workshop ($a = 15.93$), and those who were higher on AAQW were lower on PA ($b = -.11$). There was no evidence that the 1-day ACTing on Weight group workshop influenced PA independent of its effect on experiential avoidance ($c' = .10$, $p = .95$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on positive affect as measured by the PA.

(12) *Mediation analysis for group (X) > AAQW (M) > NA (Y)*. There was not a significant indirect effect of group (X) on NA (Y) through experiential avoidance (M) as measured by the AAQW $b = .86$, BCa CI $[-.34, 2.22]$. The direct effect was $c' = 4.09$, $t(58) = 2.95$, $p < .01$, 95% BCa CI $[1.31, 6.87]$. The total effect was $c = 4.95$, $t(58) = 4.01$, $p < .01$, 95% BCa CI $[2.48, 7.42]$. The significant direct effect suggests that the 1-day ACTing on

Weight group workshop is related to NA independent of AAWQ, with people in the wait-list control group reporting more NA.

(13) *Mediation analysis for group (X) >AAQW (M) > ORWELL (Y)*. There was a significant indirect effect of group (X) on ORWELL (Y) through experiential avoidance (M) as measured by the AAQW $b = 5.69$, BCa CI [2.26, 10.37]. This represents a large effect, $k^2 = .26$, 95% BCa CI [.11, .41]. The direct effect was $c' = 1.85$, $t(57) = .70$, $p = .49$, 95% BCa CI [-3.43, 7.13]. The total effect was $c = 7.54$, $t(57) = 2.78$, $p < .01$, 95% BCa CI [2.10, 12.97]. Path a was $b = 16.03$, $p < .01$, and Path b was $b = -.36$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' experiential avoidance as measured by the AAQW. Those in the wait-list control condition were higher on AAQW than those who attended the 1-day ACTing on Weight group workshop ($a = 16.03$), and those who were higher on AAQW were also higher on ORWELL ($b = .36$). There was no evidence that the 1-day ACTing on Weight group workshop influenced emotional eating independent of its effect on experiential avoidance ($c' = 1.85$, $p = .49$). In summary, experiential avoidance as measured by AAQW serves as a mediator of the effect of group on obesity related well-being as measured by the ORWELL.

In sum, weight related experiential avoidance as measured by AAQW (M) serves as a mediator of the effect of the 1-day ACTing on Weight workshop/group (X) on 10 of the 13 outcomes (Y) explored including weight, BMI, all 5 emotional eating scales, satisfaction with life, positive affect and obesity related well-being. For the emotional eating scale ERSE, there was also a significant direct effect which means that it is still significantly related to the 1-day ACTing on weight workshop independent of experiential avoidance, and suggests that there may be an/other mediator that is unaccounted for. The results also showed that there was a significant simple relationship or total effect between the 1-day ACTing on Weight workshop/group (X) and GHQ12 (Y) and NA (Y). They also showed that there was a

significant direct effect for these variables which suggests that the ACTing on Weight group workshop is related to NA and GHQ12 independent of AAWQ, with people in the wait-list control group reporting more NA and GHQ12. There were no significant effects found for waistline. Of note are the significant results for BMI, SWLS and PA which showed that the AAQW mediated the relationship between the 1-day ACTing on Weight group workshop. These significant mediation effects would not however have been illuminated if the traditional Baron and Kenny approach to mediation was used, because X (group) and Y (outcome) did not show significant bivariate correlations.

6.7.2.2 Mediation analysis for AAQII as a mediator. The second set of mediation analyses was conducted with AAQII as the mediator (M), group as the predictor (X) and the main standardised variables of interest including emotional eating as the outcome measures (Y). To begin the weight related variables are explored, followed by the emotional eating scales and then the subsidiary variables of interest. Overall there were no indirect effects or evidence of the mediation role of AAQII. There was however simple regression total effects for all 5 emotional eating scales as well as direct effects which shows that there is a relationship between group and emotional eating independent of the AAQII. There was also total and indirect effects found for GHQ12, NA and the ORWELL. No effects were found for SWLS, PA, Weight, waistline or BMI.

(1) *Mediation analysis for group (X) > AAQII (M) > weight in kilograms (Y).* There was no significant indirect effect of group on weight through experiential avoidance as measured by the AAQII $b = .15$, BCa CI $[-.10, .83]$. The direct effect was $c' = 1.14$, $t(57) = 1.72$, $p = .09$, 95% BCa CI $[-.19, 2.48]$. The total effect was $c = 1.29$, $t(57) = 1.98$, $p = .05$, 95% BCa CI $[-.02, 2.60]$.

(2) *Mediation analysis for group (X) > AAQII (M) > waistline (Y).* There was no significant indirect effect of group on waistline through experiential avoidance as measured

by the AAQII $b = .03$, BCa CI $[-.48, .99]$. The direct effect was $c' = .57$, $t(57) = .48$, $p = .63$, 95% BCa CI $[-1.80, 2.94]$. The total effect was $c = .60$, $t(57) = .52$, $p = .60$ 95% BCa CI $[-1.70, 2.90]$.

(3) *Mediation analysis for group (X) > AAQII (M) > BMI (Y)*. There was no significant indirect effect of group on BMI through experiential avoidance as measured by the AAQII $b = 0.16$, BCa CI $[-.03, .81]$. The direct effect was $c' = .09$, $t(57) = .57$, $p = .87$, 95% BCa CI $[-1.06, 1.24]$. The total effect was $c = .26$, $t(57) = .45$, $p = .65$, 95% BCa CI $[-.88, 1.39]$.

(4) *Mediation analysis for group (X) > AAQII (M) > DEBQEE (Y)*. There was no significant indirect effect of group on emotional eating as measured by the DEBQEE through experiential avoidance as measured by the AAQII $b = .10$, BCa CI $[-.01, .38]$. The direct effect was $c' = .51$, $t(55) = 3.45$, $p < .01$, 95% BCa CI $[.21, .80]$. The total effect was $c = .61$, $t(57) = 3.84$, $p < .01$ 95% BCa CI $[.29, .93]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to DEBQEE independent of AAQII, with people in the wait-list control group reporting more emotional eating. The significant total effect suggests that the ACTing on Weight group workshop is also related to DBEQEE when the AAQII is absent from the equation, with people in the wait-list control group reporting more emotional eating.

(5) *Mediation analysis for group (X) > AAQII (M) > ESRE (Y)*. There was no significant indirect effect of group on emotional eating as measured by the ESRE through experiential avoidance as measured by the AAQII $b = -2.01$, BCa CI $[-.6.98, .11]$. The direct effect was $c' = -10.72$, $t(57) = -4.32$, $p < .01$, 95% BCa CI $[-15.69, -5.75]$. The total effect was $c = -12.73$, $t(57) = -4.66$, $p < .01$ 95% BCa CI $[-18.19, -7.26]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to ESRE independent of AAQII, with people in the wait-list control group reporting more emotional eating. The

significant total effect suggests that the ACTing on Weight group workshop is also related to ESRE when the AAQII is absent from the equation, with people in the wait-list control group reporting more emotional eating.

(6) *Mediation analysis for group (X) > AAQII (M) > EESAnF (Y)*. There was no significant indirect effect of group on emotional eating as measured by the EESAnF through experiential avoidance as measured by the AAQII $b = .91$, BCa CI $[-.07, .3.60]$. The direct effect was $c' = 6.04$, $t(55) = 2.97$, $p = .04$, 95% BCa CI $[1.96, 10.12]$. The total effect was $c = 6.95$, $t(55) = 3.36$, $p < .01$ 95% BCa CI $[2.81, 11.10]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to EESAnF independent of AAQII, with people in the wait-list control group reporting more emotional eating. The significant total effect suggests that the ACTing on Weight group workshop is also related to EESAnF when the AAQII is absent from the equation, with people in the wait-list control group reporting more emotional eating.

(7) *Mediation analysis for group (X) > AAQII (M) > EESAnx (Y)*. There was no significant indirect effect of group on emotional eating as measured by the EESAnx through experiential avoidance as measured by the AAQII $b = .14$, BCa CI $[-.20, .93]$. The direct effect was $c' = 3.40$, $t(55) = 2.49$, $p = .02$, 95% BCa CI $[.67, 6.14]$. The total effect was $c = 3.54$, $t(55) = 2.67$, $p = .01$, 95% BCa CI $[.88, 6.21]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to EESAnx independent of AAQII, with people in the wait-list control group reporting more emotional eating. The significant total effect suggests that the ACTing on Weight group workshop is also related to EESAnx when the AAQII is absent from the equation, with people in the wait-list control group reporting more emotional eating.

(8) *Mediation analysis for group (X) > AAQII (M) > EESDep (Y)*. There was no significant indirect effect of group on emotional eating as measured by the EESDep through

experiential avoidance as measured by the AAQII $b = .58$, BCa CI $[-.073, 2.071]$. The direct effect was $c' = 1.91$, $t(55) = 2.19$, $p = .03$, 95% BCa CI $[.16, 3.67]$. The total effect was $c = 2.49$, $t(55) = 2.67$, $p = .01$, 95% BCa CI $[.62, 4.36]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to EESDep independent of AAQII, with people in the wait-list control group reporting more emotional eating. The significant total effect suggests that the ACTing on Weight group workshop is also related to EESDep when the AAQII is absent from the equation, with people in the wait-list control group reporting more emotional eating.

(9) *Mediation analysis for group (X) > AAQII (M) > SWLS (Y)*. There was no significant indirect effect of group on SWLS through experiential avoidance as measured by the AAQII $b = -.72$, BCa CI $[-2.41, .09]$. The direct effect was $c' = .11$, $t(57) = .10$, $p = .93$, 95% BCa CI $[-2.19, 2.41]$. The total effect was $c = -.62$, $t(57) = -.51$, $p = .62$, 95% BCa CI $[-3.04, 1.81]$.

(10) *Mediation analysis for group (X) > AAQII (M) > GHQ12 (Y)*. There was no significant indirect effect of group on GHQ12 through experiential avoidance as measured by the AAQII $b = .11$, BCa CI $[-.11, 3.47]$. The direct effect was $c' = 3.64$, $t(57) = 2.60$, $p = .01$, 95% BCa CI $[.84, 6.45]$. The total effect was $c = 4.73$, $t(57) = 3.10$, $p < .01$, 95% BCa CI $[1.67, 7.79]$. The significant direct effect suggests that the ACTing on Weight group workshop is related to GHQ12 independent of AAQII, with people in the wait-list control group reporting more ill health. The significant total effect suggests that the ACTing on Weight group workshop is also related to GHQ12 when the AAQII is absent from the equation, with people in the wait-list control group reporting more ill health.

(11) *Mediation analysis for group (X) > AAQII (M) > PA (Y)*. There was not a significant indirect effect of group on PA through experiential avoidance as measured by the AAQII $b = -.92$, BCa CI $[-2.82, .11]$. The direct effect was $c' = -.59$, $t(57) = -.38$, $p = .71$,

95% BCa CI [-3.66, 2.49]. The total effect was $c = -1.50$, $t(57) = -.94$, $p = .35$, 95% BCa CI [-4.71, 1.71].

(12) *Mediation analysis for group (X) > AAQII (M) > NA (Y)*. There was not a significant indirect effect of group on NA through experiential avoidance as measured by the AAQII $b = .51$, BCa CI [-.02, 1.52]. The direct effect was $c' = 4.15$, $t(57) = 3.45$, $p < .01$, 95% BCa CI [1.74, 6.57]. The total effect was $c = 4.66$, $t(57) = 3.83$, $p < .01$, 95% BCa CI [2.23, 7.09]. The significant direct effect suggests that the ACTing on Weight group workshop is related to NA independent of AAQII, with people in the wait-list control group reporting more NA. The significant total effect suggests that the ACTing on Weight group workshop is also related to NA when the AAQII is absent from the equation, with people in the wait-list control group reporting more NA.

(13) *Mediation analysis for group (X) > AAQII (M) > ORWELL (Y)*. There was no significant indirect effect of group on ORWELL through experiential avoidance as measured by the AAQII $b = 1.18$, BCa CI [-.197, 4.44]. The direct effect was $c' = 6.30$, $t(57) = 2.32$, $p = .02$, 95% BCa CI [.86, 11.75]. The total effect was $c = 7.48$, $t(57) = 2.71$, $p < .01$, 95% BCa CI [1.96, 13.01]. The significant direct effect suggests that the ACTing on Weight group workshop is related to ORWELL independent of AAQII, with people in the wait-list control group reporting less well-being. The significant total effect suggests that the ACTing on Weight group workshop is also related to ORWELL when the AAQII is absent from the equation, with people in the wait-list control group reporting less well-being.

6.7.2.3 Mediation analysis for CFQ28 as a mediator. The third set of mediation analysis was conducted with CFQ28 as the mediator (M), group as the predictor (X) and the main standardised variables of interest including emotional eating as the outcome measures (Y). The results are presented beginning with the weight related variables, followed by the emotional eating scales and then followed by the subsidiary variables of interest.

Overall cognitive fusion as measured by the CFQ28 (M) serves as a mediator of the effect of the 1-day ACTing on Weight group workshop/group (X) on 9 of the 13 outcomes (Y) including 4 of the 5 emotional eating measures, satisfaction with life, GHQ12, PA, NA, ORWELL.

(1) *Mediation analysis for group (X) > CFQ28 (M) > weight in kilograms (Y).* There was no significant indirect effect of group on weight through cognitive fusion as measured by the CFQ28 $b = .20$, BCa CI $[-.24, 1.11]$. The direct effect was $c' = 1.17$, $t(58) = 1.63$, $p = .11$, 95% BCa CI $[-.27, 2.60]$. The total effect was $c = 1.37$, $t(58) = 2.11$, $p = .04$ 95% BCa CI $[.07, 2.67]$. The significant total effect suggests that the ACTing on Weight group workshop is also related to ORWELL when the CFQ28 is absent from the equation, with people in the wait-list control group reporting higher weight.

(2) *Mediation analysis for group (X) > CFQ28 (M) > waistline (Y).* There was no significant indirect effect of group on waistline through cognitive fusion as measured by the CFQ28 $b = .46$, BCa CI $[-.14, 1.53]$. The direct effect was $c' = .17$, $t(58) = .14$, $p = .89$, 95% BCa CI $[-2.32, 2.66]$. The total effect was $c = .63$, $t(58) = .52$, $p = .58$, 95% BCa CI $[-1.63, 2.90]$.

(3) *Mediation analysis for group (X) > CFQ28 (M) > body mass index (Y).* There was no significant indirect effect of group on BMI through cognitive fusion as measured by the CFQ28 $b = .17$, BCa CI $[-.09, .71]$. The direct effect was $c' = .12$, $t(58) = .19$, $p = .85$, 95%

BCa CI [-1.12, 1.35]. The total effect was $c = .28$, $t(58) = .51$, $p = .62$, 95% BCa CI [-.83, 1.40].

(4) *Mediation analysis for group (X) > CFQ28 (M) > DEBQEE (Y)*. There was no significant indirect effect of group on emotional eating as measured by the DEBQEE through cognitive fusion as measured by the CFQ28 $b = .15$, BCa CI [-.05, .46]. The direct effect was $c' = .46$, $t(56) = 2.75$, $p = .01$, 95% BCa CI [.12, .80]. The total effect was $c = .61$, $t(56) = 3.92$, $p < .01$, 95% BCa CI [.30, .92]. The significant direct effect suggests that the ACTing on Weight group workshop is related to DEBQEE independent of CFQ28, with people in the wait-list control group reporting more emotional eating.

(5) *Mediation analysis for group (X) > CFQ28 (M) > ESRE (Y)*. There was a significant indirect effect of group on emotional eating as measured by the ESRE through cognitive fusion as measured by the CFQ28 $b = -4.59$, BCa CI [-9.90, -1.43]. This represents a large effect, $k^2 = .21$, 95% BCa CI [.07, .35]. The direct effect was $c' = -8.30$, $t(58) = -3.20$, $p < .01$, 95% BCa CI [-13.49, -3.11]. The total effect was $c = -12.89$, $t(58) = -4.79$, $p < .01$, 95% BCa CI [-18.28, -7.50]. Path a was $b = 18.01$, $p < .01$, and Path b was $b = -.26$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 18.01$), and those who were higher on CFQ28 were also higher on emotional eating as measured by the ESRE, which is interpreted as lower scores, mean high emotional eating ($b = -.26$). Despite the significant indirect effect, there is evidence that there is still a significant relationship between the 1-day ACTing on Weight group workshop and emotional eating independent of cognitive fusion as measured by the ESRE ($c' = -8.30$, $p < .01$); that is when cognitive fusion is controlled the relationship between group and emotional eating is still significant. In summary, experiential avoidance as measured by

CFQ28 serves as a mediator of the effect of group on emotional eating as measured by the ESRE; however, there is still variance to be explained as the total relationship between group and ESRE remained significant.

(6) *Mediation analysis for group (X) > CFQ28 (M) > EESAnF (Y)*. There was a significant indirect effect of group on emotional eating as measured by the EESAnF through cognitive fusion as measured by the CFQ28 $b = 2.86$, BCa CI [.80, 6.16]. This represents a medium to large effect, $k^2 = .17$, 95% BCa CI [.05, .32]. The direct effect was $c' = 4.23$, $t(56) = 2.06$, $p = .04$, 95% BCa CI [.11, 8.35]. The total effect was $c = 7.09$, $t(56) = 3.48$, $p < .01$, 95% BCa CI [3.01, 11.18]. Path a was $b = 16.45$, $p < .01$, and Path b was $b = .17$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating by decreasing participants' cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 16.45$), and those who were higher on CFQ28 were also higher on emotional eating as measured by the EESAnF which is interpreted as 'lower scores mean high emotional eating' ($b = .17$). Despite the significant indirect effect, there is evidence that there is still a significant relationship between the 1-day ACTing on Weight group workshop and emotional eating independent of cognitive fusion as measured by the EESAnF ($c' = 4.23$, $p = .04$); that is, when cognitive fusion is controlled, the relationship between group and emotional eating is still significant. In summary, experiential avoidance as measured by CFQ28 serves as a mediator of the effect of group on emotional eating as measured by the EESAnF; however, there is still variance to be explained as the total relationship between group and EESAnF remained significant.

(7) *Mediation analysis for group (X) > CFQ28 (M) > EESAnx (Y)*. There was a significant indirect effect of group on emotional eating as measured by the EESAnx through cognitive fusion as measured by the CFQ28 $b = 1.60$, BCa CI [.57, 2.98]. This represents a

medium to large effect, $k^2 = .14$, 95% BCa CI [.05, .25]. The direct effect was $c' = 2.28$, $t(56) = 1.62$, $p = .11$, 95% BCa CI [-.54, 5.10]. The total effect was $c = 3.88$, $t(56) = 2.86$, $p < .01$, 95% BCa CI [1.162, 6.590]. Path a was $b = 16.45$, $p < .01$, and Path b was $b = .10$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating through cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 16.45$), and those who were higher on CFQ28 were also higher on EESAnx ($b = .10$). There was no evidence that the 1-day ACT group workshop influenced emotional eating independent of its effect on cognitive fusion ($c' = 2.28$, $p = .11$). In summary, cognitive fusion as measured by the CFQ28 serves as a mediator of the effect of group on emotional eating as measured by EESAnx.

(8) *Mediation analysis for group (X) > CFQ28 (M) > EESDep (Y)*. There was a significant indirect effect of Group (X) on emotional eating as measured by the EESDep through cognitive fusion as measured by the CFQ28 $b = 1.35$, BCa CI [.48, 2.95]. This represents a medium to large effect, $k^2 = .18$, 95% BCa CI [.07, .35]. The direct effect was $c' = 1.05$, $t(56) = 1.13$, $p = .26$, 95% BCa CI [-.80, 2.89]. The total effect was $c = 2.40$, $t(56) = 2.60$, $p = .01$, 95% BCa CI [.55, 4.25]. Path a was $b = 16.45$, $p < .01$, and Path b was $b = .08$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced emotional eating through cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 16.45$), and those who were higher on CFQ28 were also higher on EESDep ($b = .08$). There was no evidence that the 1-day ACT group workshop influenced emotional eating independent of its effect on cognitive fusion ($c' = 1.05$, $p = .26$). In summary, cognitive fusion as measured by the CFQ28 serves as a mediator of the effect of group on emotional eating as measured by the EESDep.

(9) *Mediation analysis for group (X) > CFQ28 (M) > SWLS (Y)*. There was a significant indirect effect of Group (X) on SWLS through cognitive fusion as measured by the CFQ28 $b = -1.40$, BCa CI $[-2.73, -.42]$. This represents a medium to large effect, $k^2 = .15$, 95% BCa CI $[.04, .28]$. The direct effect was $c' = .85$, $t(58) = .69$, $p = .50$, 95% BCa CI $[-1.64, 3.34]$. The total effect was $c = -.55$, $t(58) = -.46$, $p = .65$, 95% BCa CI $[-2.93, 1.84]$. Path a was $b = 18.01$, $p < .01$, and Path b was $b = -.08$, $p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced SWLS through cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on cognitive fusion than those who attended the 1-day ACTing on Weight group workshop ($a = 18.01$), and those who were higher on CFQ28 were lower on SWLS ($b = -.08$). There was no evidence that the 1-day ACTing on Weight group workshop influenced independent of its effect on cognitive ($c' = .85$, $p = .50$). In summary, cognitive fusion as measured by the CFQ28 serves as a mediator of the effect of group on emotional eating as measured by the SWLS.

(10) *Mediation analysis for group (X) > CFQ28 (M) > GHQ12 (Y)*. There was a significant indirect effect of group on GHQ12 through cognitive fusion as measured by the CFQ28 $b = 1.73$, BCa CI $[.49, 3.94]$. This represents a medium to large effect, $k^2 = .14$, 95% BCa CI $[.04, .27]$. The direct effect was $c' = 3.11$, $t(58) = 1.98$, $p = .05$, 95% BCa CI $[-.04, 6.26]$. The total effect was $c = 4.84$, $t(58) = 3.21$, $p < .01$, 95% BCa CI $[1.82, 7.85]$. Path a was $b = 18.01$, $p < .01$, and Path b was $b = .10$, $p = .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced GHQ12 through cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 18.01$), and those who were higher on CFQ28 were also higher on GHQ12 ($b = .10$). There was no evidence that the 1-day ACT group workshop influenced GHQ12 independent of its effect on cognitive fusion

($c' = 3.11, p = .05$). In summary, cognitive fusion as measured by the CFQ28 serves as a mediator of the effect of group on emotional eating as measured by the GHQ12.

(11) *Mediation analysis for group (X) > CFQ28 (M) > PA (Y)*. There was a significant indirect effect of Group (X) on PA through cognitive fusion as measured by the CFQ28 $b = -3.34$, BCa CI [-6.61, -1.18]. This represents a large effect, $k^2 = .29$, 95% BCa CI [.12, .47]. The direct effect was $c' = 1.62, t(58) = 1.16, p = .25$, 95% BCa CI [-1.18, 4.43]. The total effect was $c = -1.72, t(58) = -1.07, p = .29$, 95% BCa CI [-4.91, 1.48]. Path a was $b = 18.01, p < .01$, and Path b was $b = -.19, p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced PA through cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on cognitive fusion than those who attended the 1-day ACTing on Weight group workshop ($a = 18.01$), and those who were higher on AAQW were lower on PA ($b = -.19$). There was no evidence that the 1-day ACTing on Weight group workshop influenced PA independent of its effect on cognitive fusion ($c' = 1.62, p = .25$). In summary, cognitive fusion as measured by the CFQ28 serves as a mediator of the effect of group on emotional eating as measured by the PA.

(12) *Mediation analysis for group (X) > CFQ28 (M) > NA (Y)*. There was a significant indirect effect of Group (X) on NA through cognitive fusion as measured by the CFQ28 $b = 1.40$, BCa CI [.25, 3.30]. This represents a medium to large effect, $k^2 = .14$, 95% BCa CI [.03, .85]. The direct effect was $c' = 3.55, t(58) = 2.75, p < .01$, 95% BCa CI [.97, 6.13]. The total effect was $c = 4.95, t(58) = 4.01, p < .01$, 95% BCa CI [2.48, 7.42]. Path a was $b = 18.01, p < .01$, and Path b was $b = .08, p = .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced NA by decreasing participants' cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 18.01$), and those who were higher on CFQ28 were also higher on negative affect as measured by the NA ($b = .08$).

Despite the significant indirect effect, there is evidence that there is still a significant relationship between the 1-day ACTing on Weight group workshop and negative affect independent of cognitive fusion as measured by the NA ($c' = 3.55, p < .01$); that is, when cognitive fusion is controlled the relationship between group and negative affect is still significant. In summary, cognitive fusion as measured by CFQ28 serves as a mediator of the effect of group on negative affect as measured by the NA; however, there is still variance to be explained as the total relationship between group and NA remained significant.

(13) *Mediation analysis for group (X) > CFQ28 (M) > ORWELL (Y)*. There was a significant indirect effect of Group (X) on ORWELL through cognitive fusion as measured by the CFQ28 $b = 3.77$, BCa CI [1.21, 7.36]. This represents a medium to large effect, $k^2 = .17$, 95% BCa CI [.06, .30]. The direct effect was $c' = 3.77, t(58) = 1.38, p = .17$, 95% BCa CI [-1.72, 9.26]. The total effect was $c = 7.54, t(58) = 2.78, p < .01$ 95% BCa CI [2.11, 12.97]. Path a was $b = 18.06, p < .01$, and Path b was $b = .21, p < .01$. Simply, the 1-day ACTing on Weight group workshop indirectly influenced ORWELL through cognitive fusion as measured by the CFQ28. Those in the wait-list control condition were higher on CFQ28 than those who attended the 1-day ACTing on Weight group workshop ($a = 18.06$), and those who were higher on CFQ28 were also higher on ORWELL ($b = .10$). There was no evidence that the 1-day ACT group workshop influenced ORWELL independent of its effect on experiential avoidance ($c' = 3.77, p = .17$). In summary, cognitive fusion as measured by the CFQ28 serves as a mediator of the effect of group on obesity related well-being as measured by the ORWELL.

In summary, cognitive fusion as measured by the CFQ28 (M) serves as a mediator of the effect of the 1-day ACTing on Weight group workshop/group (X) on 9 of the 13 outcomes (Y) including all of the emotional eating measures except the DEBQEE, as well as SWLS, GHQ12, PA, NA, ORWELL. For two of the emotional eating scales, ERSE and EESAnF,

there was also significant direct effect which means that they are still significantly related to the 1-day ACTing on weight workshop independent of cognitive fusion, and this suggests that there may be an/other mediator that is unaccounted for. The results showed also that there was a significant simple relationship or total effect and a direct effect between the 1-day ACTing on Weight workshop/group (*X*) and DEBQEE (*Y*) with people in the wait-list control group reporting more emotional eating independent of cognitive fusion. Of note are the results for SWLS and PA which showed that the CFQ28 mediated the relationship between the 1-day ACTing on Weight group workshop and these variables; however, these significant mediation effects would not have been illuminated if the traditional Baron and Kenny approach to mediation was used, because in step one *X* (group) and *Y* (*outcome*) were not significantly related. There were no significant effects found for weight, waistline or BMI.

6.8 Summary of Results for Mediation Analyses

To summarise this subset of results detailed mediation analyses results, it is the indirect effect that is of most importance and the results of this have been summarised in Table 66.

Table 66

Summary of the Indirect Effects: The group treatment (X) indirect influence on outcome (Y) through its effect on (M)

Mediator (M)	Significant indirect effect		
	AAQW	AAQII	CFQ28
Outcome Variable			
(Y)			
DEBQEE	✓	×	×
ESRE	✓	×	✓
EESAnF	✓	×	✓
EESAnx	✓	×	✓
EESDep	✓	×	✓
SWLS	✓	×	✓
GHQ12	×	×	✓
PA	✓	×	✓
NA	×	×	✓
ORWELL	✓	×	✓
Weight	✓	×	×
Waistline	×	×	×
BMI	✓	×	×

Note: ✓ = Significant; × = non significant. DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale; EESAnF = Emotional Eating Scale - Anger Frustration subscale; EESAnx = Emotional Eating Scale - Anxiety subscale; EESDep = Emotional Eating Scale - Depression subscale; SWLS = Satisfaction with Life Scale; GHQ12 = General Health Questionnaire-12; PA = Positive Affect; NA = Negative Affect; ORWELL = Obesity related Well-being Questionnaire.

Chapter 7

7.1 Overview

As rates of overweight and obesity continue to rise in developed nations, so too, do the associated risks of mortality and morbidity. The antidote to these risks is weight loss. However, while most people can lose weight through proven traditional weight loss behavioural strategies, most people are unsuccessful in their weight loss maintenance efforts. This doctoral research synthesised the empirical research pertaining to weight loss maintenance, and found that the hitherto under explored psychological factor of emotional eating may provide some answers to the problem of unsuccessful weight loss maintenance, and that an ACT treatment intervention can help this problem.

The global aim of this current research study was to evaluate the efficacy of a 1-day ACT group based workshop treatment intervention for people who had recently lost weight. The study targeted emotional eating to facilitate weight loss maintenance, using a randomised controlled trial design, comparing a treatment group to a wait-list control group. This aim was achieved, and consequently, this research constitutes the first intervention study to quantitatively bring together, in the context of weight loss maintenance, an ACT treatment intervention with quantitative measurements of ACT's two core mechanisms of action experiential avoidance and cognitive fusion, as well as measures of emotional eating.

Overall, the results of the statistical evaluation show that participants who attended the 1-day ACTing on Weight group workshop were significantly more likely to be characterised as maintaining weight, significantly less likely to be characterised as gaining weight, and showed significant decreases in emotional eating. They were also more likely to experience significantly more weight loss, and report significant improvements in the areas of general health, obesity related well-being, negative affect, weight related experiential

avoidance and cognitive fusion, while satisfaction with life, positive affect and general experiential avoidance improved but not significantly. Further to these main effects, mediational analyses revealed that weight related experiential avoidance was found to serve as a mediator of the effect of the 1-day ACTing on Weight group workshop for 10 of the 13 outcome variables including weight, BMI, five emotional eating scales, satisfaction with life, positive affect and obesity related well-being. In addition, cognitive fusion was found to serve as a mediator of the effect of the 1-day ACTing on Weight group workshop for 9 of the 13 outcome variables, including four emotional eating scales, satisfaction with life, general health, positive affect, negative affect and obesity related well-being.

The global message from these results is that a 1-day ACT group based workshop was effective in improving emotional eating and weight loss maintenance and related outcomes, including weight loss. The results also show that weight related experiential avoidance is likely a key mechanism of action underlying emotional eating, which acts to confirm a prior limited, yet cumulative, theoretical and empirical literature knowledge. At the same time, significant findings show cognitive fusion's mediational quality, and enables a prior speculation to be replaced with quantitative empirical evidence regarding its contribution to the emotional eating and weight loss maintenance equation.

This discussion will briefly review the results, encapsulating their meaning, contextualise patterns of findings within previous research findings, review methodological considerations, list the strengths and limitations of this research study and highlight the theoretical and practical implications of the findings before finishing with a final conclusion.

7.2 Did the 1-day ACTing on Weight group workshop produce significant outcomes?

The first hypothesis stemming from the main research question was 'It is hypothesised that participants who attend the 1-day ACTing on Weight group workshop will

show significantly improved weight outcomes compared to participants in the wait-list control group’.

This hypothesis was positively upheld. Both weight loss maintenance categories and weight in kilograms were analysed for between-group differences (see Chapter Six). The results show that the participants in the 1-day ACTing on Weight group workshop (treatment group) were significantly more likely to maintain their weight loss than those in the wait-list control group (control group), with only 4% ($n = 1$) of participants in the treatment group gaining weight at the three-month follow-up assessment, as compared to 25% ($n = 8$) of participants in the control group. This means that if an individual attended the 1-day ACTing on Weight group workshop, the likelihood of gaining weight was lower by 14% than if an individual did not attend the workshop. These findings mean that the 1-day ACTing on Weight group workshop is protective against weight regain and promotes successful weight loss maintenance. The results also showed that there was a significant difference between the groups at follow-up, on weight in kilograms, after adjusting for pre-treatment scores, with participants who attended the 1-day ACTing on Weight group workshop reporting greater decreases in weight. Specifically, the treatment group showed a mean decrease in weight of 4.89kg compared to the control group who showed a mean increase of 1.12kg, a gap of 6.01kgs. It is noteworthy again, that weight loss was not a target of the treatment intervention.

There were no significant differences found between the two groups at follow-up on the variables of BMI and waistline. The results did, however, follow a trend for improved outcomes for participants in the treatment group, with BMI showing a mean decrease of 2.1 points compared to participants in the control group whose mean change was an increase of 0.55 points. Similarly, whilst not reaching statistical significance, the treatment group experienced a decrease in waistline measurement from 101.21cm to 95.34cm, a mean

decrease of 5.87cm compared to the control group who increased their mean waistline measurement by 0.54cm.

After the weight specific variables were analysed three analyses were performed to elucidate group differences on each of the emotional eating scales (i.e., the ESRE, the DEBQEE and the three EES subscales), these were analysed along with experiential avoidance, weight related experiential avoidance, cognitive fusion, satisfaction with life, positive affect, negative affect, general health and obesity related well-being. This group of analyses provided responses to hypotheses 1.2-1.5 which together predict that participants in the treatment group will show significant improvements on all variables after attending the 1-day ACTing on Weight workshop, compared to the control group.

The results of the analyses showed the same pattern of results for each emotional eating scale (see Chapter Six), and showed that there was a significant difference between the two groups on six of the nine variables, where the treatment group reported significant improvements in general health, negative affect, emotional eating, weight related experiential avoidance, cognitive fusion, and obesity related well-being. With specific regard to the emotional eating scale changes, participants in the treatment group showed significant improvements on all five emotional eating scales in the desired and expected direction. The results show decreases in emotional eating as measured by the ESRE which means that participants in the treatment group reported less eating as a coping mechanism for alleviating and dealing with stress and emotion (Ozier et al., 2007). With regards to improvements in emotional eating as measured by the DEBQEE it means that participants in the treatment group reported decreases in eating in response to emotion. With regards to emotional eating as measured by the three EES subscales the results mean that participants in the treatment group reported less urges to eat in response to the emotions of anger/frustration, anxiety, and depression. As noted in Chapter Six, a subsidiary discriminant factor analysis was conducted

to complement the main analyses to help uncover the dimensions of values that may differentiate the treatment group and the wait-list control group. The results were consistent with the main analysis and showed that dimensions of values on emotional eating differentiated the treatment group from the control group. This means that emotional eating, assessed in a variety of ways, tended to be better managed by those in the treatment group than by those in the control group.

With regards to changes in weight related experiential avoidance (AAQW) and cognitive fusion (CFQ28), participants in the treatment group reported statistically significant improvements in both of these areas compared to the control group. This means that participants in the treatment group learnt how to change their relationship with their thoughts and feelings, instead of trying to control and change them or avoid them. More specifically it means that participants in the treatment group reported increases in acceptance of difficult weight related thoughts and feelings and were more able to take valued actions despite the presence of difficult unwanted internal experiences. It also means that participants in the treatment group reported increases in their ability to notice thoughts and choose to act rather than react and be governed by their thoughts. The function of improvements in both of these areas means that participants in the treatment group increased their psychological flexibility, which enabled them to take valued actions consistent with reducing emotional eating and increasing weight loss maintenance behaviours, or more simply they were more able to increase health behaviours. Complementing the results for the main variables of interest were the results for the subsidiary variables that showed that the treatment group were more likely to report significant improvement in general health, obesity related well-being and negative affect and improvement, although not significant, in satisfaction with life, positive affect and general experiential avoidance. These findings suggest that the skills learnt through the ACT intervention seem to have been somewhat generalised into the lives of people who attended

the workshop, and they were able to apply psychological flexibility skills to domains in life over and above the presenting issues of emotional eating and weight loss maintenance.

The next section will review this study's results within the context of the previous empirical research.

7.3 Outcomes of the 1-day ACTing on Weight group workshop in the context of the previous research

As a general rule, the worth of empirical research findings can only be appreciated in the context of patterns of previous research results. This current study is unique, as the previous research literature does not include a randomised trial of an ACT treatment intervention, targeting emotional eating, in the context of weight loss maintenance, while quantitatively measuring ACT's two core mechanisms of action; experiential avoidance and cognitive fusion. The patterns found in this study however are highly relevant to, and expand upon, the knowledge contained within previously published studies. Notably, this current research study extended, and was inspired by Lillis et al. (2009).

The extensions to Lillis et al. (2009) incorporated in this study are the inclusion of: (a) psychometrically reliable and valid measures of emotional eating, (b) a psychometric measure of cognitive fusion, (c) subjective well-being measures, (d) a waistline measure, (e) the targeting of people who struggle with emotional eating for participation in the research. The inclusion of these variables addressed a number of the limitations found across the weight loss maintenance and ACT literature. Conversely, the similarities of this study and that of Lillis et al. (2009) are that: (a) both are controlled trials of a 1-day ACT intervention with no explicit instruction in weight loss, (b) participants had already lost weight before entering the treatment trial (c) participants were randomly assigned to either the treatment group or a wait-list control group, (d) quantitative measures were assessed at pre (baseline) and post (3 months), (e) weight was objectively measured, not self-reported. Also replicated

were measures relating to the constructs of general experiential avoidance, weight related experiential avoidance, general health, obesity related well-being and weight maintenance category. They were measured by the AAQII, the AAQW, the GHQ12, and the ORWELL as described in Chapter Five. The replication of these measures was deliberate in order to address another limitation noted in the previous cumulative literature regarding the heterogeneous nature of the measures used in research which limits the identification of patterns, and thus restricts the conclusions that can be drawn about the variables contributing to the weight loss maintenance equation (Barte et al., 2010; Stubbs et al., 2011; Stubbs & Lavin, 2013).

7.3.1 Weight related variable results in the context of the ACT literature.

Overall the pattern of results for the weight related variables in this study are congruent with the results elicited by Lillis et al.(2009), who found a 1-day ACT group based workshop was more effective than a wait-list control in facilitating weight loss maintenance and weight loss. Both this study and Lillis et al. (2009) found that 25% of those in the control group gained weight, while in this current study, only 4% of people in the intervention gained weight and in Lillis et al. (2009) 7% gained weight. Both were statistically significant. Similarly, the results of both studies found that participants who attended the 1-day ACT group based workshop lost a significant amount of weight compared to the control group despite weight loss per se not being an aim of either interventions. Specifically, Lillis et al. (2009) found that participants in the treatment group lost 1.5% of their body weight, while those in the wait-list control group gained 0.3% of their body weight (or 1.7% and 0.5%, adjusted for weight history). In this current study, the treatment group at follow-up had lost 5.8% of their body weight, while the control group gained 1.4% of their body weight. In contrast to Lillis et al. (2009), however, the current study did not find a significant difference in BMI measurements between the two groups despite the treatment group reporting decreases and the control group

reporting increases in BMI. In this way the current study is more similar to Tapper et al. (2009) as both treatment groups showed greater improvements in BMI than the control group but the results were not significant. No other comparable studies measured waistline, and as such the results of this study are the first stepping stones in this potential line of enquiry.

In considering the pattern of results pertaining to the weight related variables across this current study and Lillis et al. (2009), it is evident that when viewed together, the results show a pattern that a 1-day ACT treatment intervention post initial weight loss is effective for weight loss maintenance, as well as further weight loss. More broadly the results of this study can be placed within what is now a clear pattern from ACT treatment intervention studies that show ACT is helpful for weight management (Forman & Butryn et al., 2012; Niemeier, et al., 2012; Tapper, et al., 2009). More noteworthy than providing support for this general pattern, however, is that the significant results in this current study and Lillis et al. (2009) were produced with a comparatively brief intervention. This current study, along with Lillis et al. (2009), and to a lesser extent Tapper et al. (2009), produced positive and significant results using a 1-day ACT intervention group workshop format. In comparison, three other already reviewed ACT based intervention studies targeting weight found positive results for ACT but their intervention lengths ranged from 12 to 40 weeks (Forman et al., 2009; Forman & Butryn et al., 2012; Niemeier et al., 2012). In addition to this, both this study's intervention and the intervention by Lillis et al. (2009) did not include any focus or teaching of traditional behavioural weight loss strategies and delivered the intervention after the initial weight loss stage. Comparatively, Forman (2009), Forman & Butryn et al. (2012) and Niemeier et al. (2012) all intervened at the initial weight loss stage and included teaching of traditional behavioural weight loss strategies and overlaid acceptance based strategies drawn from ACT.

When considering that the previous research from the overweight and obesity literature shows that most people do not have a problem losing weight, just a problem

maintaining lost weight, the study designs of Forman et al. (2009), Forman & Butryn et al. (2012), and Niemeier et al. (2012) can be viewed as incongruent with the problem of weight loss maintenance as they intervene at the initial weight loss stage. Conversely the current study and Lillis et al. (2009) intervene at the weight loss maintenance stage, and the results can be seen to confirm that most people do not need additional skills to help them lose weight, but they do need new psychological skills to help them maintain lost weight. One possible implication of these study's results is that current behavioural weight loss strategies and programs do not need to be overhauled, reinvented or repackaged as assumed in some other ACT studies. Instead of repacking known behavioural weight loss strategies that are workable and have been proven to produce weight loss, and maintenance if adhered to, this study's results concur with Lillis et al. (2009) who concludes that a 1-day ACT intervention would be a cost-effective way to augment weight loss maintenance efforts and promote weight loss maintenance. The similarities between this study and Lillis et al. (2009) diverge with the inclusion of the psychometric measures of emotional eating. Next, this discussion reviews the results elicited from the emotional eating measures included in this study and contextualises them within the previous empirical ACT research.

7.3.2 Emotional eating results within the context of the previous empirical ACT research. There are four previous studies that provided specific preliminary support for the rationale that an ACT treatment intervention would likely be effective in facilitating changes in emotional eating (Forman et al., 2009; Forman & Butryn et al., 2012; Niemeier et al., 2012; Tapper et al., 2009). The current study, however, is the first and only randomised ACT treatment intervention study that has elicited statistically significant main effect results for improvements in emotional eating. As a result it provides substantial confirmatory support to the earlier studies and also provides support to the emerging pattern that indicates that ACT is

most likely helpful for people who really struggle with emotional eating, that is, those people who score in the high end of emotional eating measures.

This pattern emerges from Niemeier et al. (2012), and Forman and colleagues (2007; 2012; 2013). Firstly, the inclusion criteria for participation in Niemeier et al. (2012) were scores in the high end of internal disinhibition (emotional eating and dichotomous thinking) where results showed that an acceptance based intervention was helpful for those people. Secondly, Forman & Butryn et al. (2012) found that ACT was most helpful for those participants who scored in the high end of emotional eating. These findings are further congruent with the trends found by Forman & Hoffman et al. (2007) and Forman et al. (2013) who both suggested that acceptance based strategies were most helpful for people with the greatest susceptibility to food and consumption. Similarly Moffitt et al. (2012) found that participants who experience high levels of distress found that cognitive defusion was most helpful in managing food cravings. The reason that this study is seen to comport with this emerging pattern is that, similar to Niemeier et al. (2012), recruitment targeted people identifying as struggling with emotional eating with the recruitment advertising including the question “Does emotional eating ruin your weight loss efforts?”. As a consequence it is possible that the people who volunteered for this study found the intervention helpful because they identified as struggling with emotional eating. Given the uniqueness of this specific pattern it could be premature to highlight it; however with the addition of this research a strong foundation is forming to show that ACT based interventions are helpful for people who struggle with their weight and it is especially helpful for people who struggle with emotional eating.

7.3.3 Contextualising the results within the broader ACT literature pertaining to eating and health concerns. In addition to the empirical publications that provided direct support for this study’s rationale a number of other studies found within the ACT and

disordered eating literature provided supplementary support for this study's feasibility. These publications were detailed in section 3.9. Collectively, the studies showed that unhelpful avoidance based coping, for example thought suppression, predicted eating disorder related pathology and may also be related to overweight and obesity (Barnes & Tantleff-Dunn, 2010). As a whole the group of studies show that ACT treatment interventions produced improvements in symptoms spanning the spectrum of weight concerns including clinical and sub-clinical eating pathology and body dissatisfaction, although results often constitute trends and not statistically significant results (Juarasico et al., 2010; Juarasico et al., 2013; Lillis, Hayes et al. 2011; Lillis & Levin et al., 2011; Masuda & Latzman, 2013; Pearson et al., 2012; Weineland et al., 2012). Of these studies the results of this research comport most significantly with Weineland et al. (2012) who reported that "it is possible to improve effects of bariatric surgery by specifically targeting emotional eating behaviour" via an ACT treatment intervention (p. e21). A number of other ACT intervention studies also show improvements on weight related experiential avoidance over a range of issues including body dissatisfaction, disordered eating, binge eating, BMI and quality of life (Pearson et al., 2012; Lillis & Hayes et al., 2011; Lillis & Levin et al., 2011). The results of this current study thus contribute consistent and conformity findings to the ACT based literature about the helpfulness of ACT for weight and eating related issues.

Evidence for the utility of ACT within the area of health related behaviour change was also presented earlier in section 3.10. This evidence was presented to show that ACT has begun to be widely applied to a range of health problems with positive results to further support the rationale for this study. Now, in return, the results of this current research provide consistent and complementary evidence for these previous studies. The results of this study are most similar to Gregg et al. (2007) who found through mediation analyses that diabetes related experiential avoidance was the mechanism of action underlying better diabetes self-

management. Weight loss maintenance and diabetes self-management can be seen as similar as they both require people to engage in ongoing positive health behaviours. As a whole the results of this study add to the cumulating evidence that ACT is helpful for weight, weight related concerns and more broadly health related concerns.

Up to this point this discussion has focussed on contextualising this study's pattern of results within the ACT based literature. The need for the study, however preliminary, stems from the specific problem of low rates of successful weight loss maintenance, where the collective literature primarily falls within the research domain of overweight and obesity. The next section focuses on the results within the context of the previous weight loss maintenance literature.

7.3.4 The results contextualised within the previous weight loss maintenance literature. Over 40 years ago Leon and Chamberlain (1973) called for future research to clarify *how* individuals can learn to limit eating in response to emotion, which appears to be a characteristic of those who have successfully lost weight and maintained their weight loss. Until now this call has gone relatively unheard, with few empirical studies conducted that go beyond simply agreeing with this call and simply finding that emotional eating and successful weight loss maintenance are likely correlated.

Of the non-ACT related studies reviewed in Chapter Two there are seven studies that when considered together, provide compelling evidence that emotional eating is likely a significant variable contributing to unsuccessful weight loss maintenance. Five of these studies constitute intervention studies, and were published between 2008 and 2012. Of these five studies, none explicitly targeted the theoretical mechanism of action proposed to underlie emotional eating, i.e. avoidance.

The current study is the first one that has empirically tested a psychological treatment intervention that targets the theoretical mechanism of action underlying emotional eating in

the specific context of weight loss maintenance. By addressing this research gap this study has shown that targeting avoidance through a psychological intervention is effective in producing significant positive change in emotional eating, weight loss maintenance, as well as weight loss. Specifically, it has shown that emotional eating and weight loss maintenance can be changed via an ACT intervention and that weight related experiential avoidance and cognitive fusion serve as mediators of the effect of the ACT intervention especially for emotional eating, but also for other subsidiary variables. This discussion will now move on to address experiential avoidance and cognitive fusion's main effects and mediation results in the context of previous findings.

7.3.5 Experiential avoidance and cognitive fusion: Main and mediation effect results in the context of previous findings. The main effect findings showing that the 1-day ACTing on Weight group based workshop produced significant improvement in weight related experiential avoidance is consistent with the pattern of other ACT intervention studies where the AAQW has been employed (Lillis et al., 2009; Niemeier et al., 2012, Weineland et al., 2012; Pearson et al., 2012). This study's results are most similar to Lillis et al. (2009) who also found that a 1-day ACT intervention significantly changed weight related experiential avoidance. This study, together with the previous studies, provide cumulative evidence that an ACT intervention can change weight related experiential avoidance.

In contrast this study's results for general experiential avoidance as measured by the AAQII (Bond et al., 2011) are inconsistent with the broad ACT literature where general experiential avoidance is usually found to significantly improve after ACT interventions (Hayes et al., 2012). Instead, this study is similar to Tapper et al. (2009) who found limited significant results for general experiential avoidance in their ACT intervention for weight. Although Lillis et al. (2009) did elicit significant results for general experiential avoidance, the magnitude of the change was smaller compared to weight related experiential avoidance.

A plausible reason that may explain why this study failed to elicit significant results for general experiential avoidance can be found in the latest ACT literature. Recently a pattern has emerged showing that more specific versions of the AAQ are better suited to measuring changes in outcome measures where specific problems have been targeted within an ACT intervention like in this study (Hayes et al., 2012). Given the recency of this pattern including both the AAQII and the AAQW it can be considered a strength of this study as it contributes to the knowledge about the differential uses of general and specific AAQs.

As detailed in Chapter Three experiential avoidance and cognitive fusion are the two core mechanisms of action in the ACT model. Despite this however, cognitive fusion has rarely been explored using psychometrically reliable and valid measures. For this reason, including a measure of cognitive fusion in empirical studies is unique and can be considered a significant step forward in ACT treatment intervention research. A consequence of this uniqueness however is that there are limited comparable studies in which to extract patterns across results. The only ACT based intervention study found that measured cognitive fusion psychometrically in a relevant area was Butryn et al. (2011) who conducted a pilot study of an ACT intervention for the promotion of physical activity. They found that the ACT treatment group showed improvements in defusion as compared to the comparison group who received education; here the Drexel Defusion Scale was used (DDS: Forman, Herbert, & Moitra, 2008 as cited in Butryn et al. 2011). A number of other authors make statements in their conclusions about the *likelihood* of cognitive defusion playing a significant role in their interventions for positive outcomes in weight and food-related variables, however they do not psychometrically measure cognitive fusion which considerably limits their conclusions (Hopper et al., 2012; Moffitt et al., 2012; Tapper et al., 2009). The addition of this study's findings can however be seen to act as empirical support to studies like Hopper et al. (2012) and Moffitt et al. (2012) who concluded that instruction in cognitive defusion as a distinct

component of ACT is likely to be helpful for food craving and craving related food consumption but who don't actually psychometrically measure changes in cognitive fusion/defusion.

The significant positive changes in weight related experiential avoidance and cognitive fusion found in this study are in and of themselves important and unique findings and add important knowledge to both the weight loss maintenance specific literature and the ACT specific literature. Even more significant and unique than the main effect results however are the results showing the mediational quality of weight related experiential avoidance and cognitive fusion for emotional eating and weight.

The results of this study confirmed expectations and upheld this study's hypothesis 2.1 when the analyses revealed that weight related experiential avoidance was found to serve as a mediator of the 1-day ACTing on Weight group workshop on emotional eating and weight. This result means that the intervention was effective in improving weight related experiential avoidance, and further that such improvement produced the improvement in emotional eating and weight. Where Evers et al. (2010) state that their study is a "promising first step regarding emotional regulation strategy as an explaining mechanism behind emotional eating" (p. 801), this study can be seen as another step forward because it shows that the unhelpful emotion regulation strategy of avoidance can be changed, and that it in turn improves weight and emotional eating outcomes. Considering the limited yet united call for research to be conducted to explore psychological interventions that target emotional eating's underlying mechanism of action, this study responds to the identified lack of previous research and provides novel results in the context of weight loss maintenance. In a practical sense, this finding simply means that by targeting and changing avoidance via an ACT treatment intervention, significant improvements in weight and emotional eating can be produced. To date, no other previous findings have shown significant mediation of an ACT

intervention with experiential avoidance and emotional eating, although Forman & Butryn et al. (2012) did show a significant moderated mediation effect for people with high scores in emotional eating. Lillis et al. (2009) also found that weight related experiential avoidance mediated weight, BMI and related variables in their study. The mediation results in this study also show that weight related experiential avoidance serves as a mediator of the effect of the intervention on BMI, although not waistline. The results of this study are of specific value within the weight loss maintenance research field because, as already highlighted, elucidating underlying mechanisms of action for weight loss maintenance has been a broadly unmet challenge (Byrne, 2002).

Even more novel than the mediation results for weight related experiential avoidance however are the study's significant results that show cognitive fusion serves as a mediator of the effect of the 1-day ACTing on Weight group workshop. While a number of authors have speculated that cognitive fusion is an underlying mechanism of action for weight related variables, this is the first study to use a psychometric measure of cognitive fusion and further, the first to subject it to multivariate statistical techniques including mediation along with the variables of emotional eating and weight. In this context the results of this study are important as they are the first to empirically show that cognitive fusion plays a role in emotional eating. This study found that cognitive fusion served as a mediator of the effect of the intervention on four of the five emotional eating scales. This means that like weight related experiential avoidance, cognitive fusion is also an underlying mechanism of action of emotional eating and by targeting and changing cognitive fusion via an ACT treatment intervention, significant improvements in emotional eating can be produced. The findings together have practical implications for treatment because it indicates that both mechanism of action need to be targeted in treatment. A note of caution on this point is however warranted; the potential overlap of variance between weight related experiential avoidance and cognitive

fusion was not delineated in the results because each measure was analysed on its own due to the exploratory and pilot nature of the study. More complex analyses in future research could reveal the relative contribution of each construct.

Despite this being the first study to show that cognitive fusion may explain variance in emotional eating and weight related variables, two other studies have shown that dichotomous thinking or its inverse, flexible cognitive restraint, is a significant predictor of weight loss maintenance. It is possible that the results in this study that show cognitive fusion is a significant variable comport with these previous findings if a view is held that cognitive fusion and dichotomous thinking are related constructs. If cognitive fusion and dichotomous thinking are both described as unhelpful coping strategies that involve rigid thinking that dominate behaviour, it is possible that the variance attributed to cognitive fusion in this study is measuring the variance attributed to dichotomous thinking and its inverse flexible cognitive restraint in previous studies (Byrne et al., 2004; Teixeira et al., 2010). Although it is beyond the scope of this discussion to fully delineate the similarities and differences between dichotomous thinking and cognitive fusion, it is relevant to consider how they may overlap as this may have implications for future research. For example, as noted earlier in section 3.11 Gregg et al. (2011) describe dichotomous thinking as “reflecting” cognitive fusion (p. 84). They describe dichotomous thinking as “all or nothing thinking” and cognitive fusion as inflexible “verbal rules” attached to thoughts and experiences where both processes decrease behavioural and psychological flexibility and the engagement in valued actions (p. 83). In this way both processes can be seen as the unhelpful application of rigid verbal rules that limit a person’s ability to engage in valued action. Given the apparent, yet empirically unexplored, overlap between dichotomous thinking and cognitive fusion researchers focusing within the weight loss maintenance literature, where dichotomous thinking is more likely to be measured, should be aware that findings pertaining to cognitive fusion and weight within

the ACT literature exist and may comport with their findings, and visa-versa. For example Teixeira et al. (2010) found that flexible cognitive restraint may be an underlying psychological mechanism of action in the weight loss maintenance equation where flexible cognitive restraint is the inverse of dichotomous thinking. In conclusion Teixeira et al. (2010) state interventions “should focus on reducing emotional eating and promoting a flexible, non-dichotomous” approach (p. 734). Congruently this research shows that by increasing cognitive defusion and promoting psychological flexibility positive changes in emotional eating are produced.

In contrast to the significant positive mediation results elicited for weight related experiential avoidance and cognitive fusion this study did not elicit any significant mediation results for general experiential avoidance as measured by the AAQII (Bond et al., 2011). This result was unexpected, given that Lillis et al. (2009) did find that it served as a mediator of their 1-day ACT intervention, although similar to this study it was insignificant for BMI. Further in the context of the broader research this study’s finding is an anomaly, as general experiential avoidance as measured by the AAQII has been found to be a consistent mediator of ACT interventions (Hayes et al., 2012). As noted earlier, there is a burgeoning general consensus within the literature that specific versions of the AAQ, like the AAQW, are better measures to employ when targeted ACT intervention protocols are used. Specifically, Hayes et al. (2012) recently stated that “with targeted protocols the AAQ can be too broad” (p. 367), and this is what has led to the emergence of specific AAQs that “ask about specific problems thoughts, feelings, or actions linked to specific areas of functioning” (p.367). It is within this paradigm that the divergent results for both the main and mediation effects for the AAQW and AAQ in this study can be viewed.

Up to this point the discussion has focussed on the main variables of interest, namely weight, experiential avoidance and cognitive fusion. Results were also extracted for

satisfaction with life (SWLS), positive affect (PANAS: PA), negative affect (PANAS: NA), obesity related well-being (ORWELL) and general health (GHQ12). The main and mediation results for these subsidiary variables are discussed next.

7.3.6 Main and mediation results discussion for the subsidiary variables. To briefly re-cap five subsidiary health and subjective well-being measures were included in this study. Of these five, obesity related well-being and general health, as measured by the ORWELL and the GHQ12, were included to replicate Lillis et al. (2009). The three subjective well-being measures, satisfaction with life, positive affect and negative affect, as measured by the SWLS and PANAS, were included to extend knowledge of variables in this domain which have been identified as limited in the past weight loss maintenance literature. For example, Akers, Estabrooks, Davy (2010) concluded that including well-being measures would “determine whether a given intervention is successful in maintaining weight loss maintenance but also influenced quality of life” (p. 1520). For these variables the results show that the 1-day ACTing on Weight group workshop significantly improved general health, obesity related well-being and negative affect for people in the intervention group compared to the control group. Conversely while improvements were found for the treatment group in satisfaction with life and positive affect effects were not significant. There is limited comparable research in which to review this pattern of results; however the results seem consistent with the results available. Lillis et al. (2009) also found significant main effects for general health and obesity related well-being and other studies have found similar results (Brinkborg, Michanek, Hesser & Berglund, 2011; Flaxman & Bond, 2010). One RCT ACT study exploring anxiety and depression employed the SWLS and found significant improvements in satisfaction with life, but no difference in outcomes when compared to cognitive therapy (Forman, Herbert, & Moitra, Yeomans, & Geller, 2007). No ACT study that employed the PANAS was found.

The SWLS and the PANAS are two measures commonly found within the subjective well-being research literature subsumed within the Positive Psychology research domain. Including these two scales in an ACT intervention treatment trial is relatively unique and thus contextualising the results with previous findings is restricted. The results generated from this study alone are mixed when considering the main and mediation effects. Specifically, the main effects show non-significant improvements for satisfaction with life and positive affect, however the mediation analysis shows that the improvements were mediated by improvements in weight related experiential avoidance and cognitive fusion. Similarly, the results also show that cognitive fusion, but not weight related experiential avoidance, served as a mediator of the effect of the 1-day ACTing on Weight group workshop on general health and negative affect. At this point in time interpretation of these results, without any comparative data, would be quite speculative and instead the results provide impetus for future research exploring these variables within the context of ACT, paying specific attention to mediation analyses.

Despite some mixed findings for the mediation analyses, mainly for the subsidiary variables, as a whole this study's mediation analyses provides clear empirical evidence of the mediational quality of weight related experiential avoidance and cognitive fusion, for improvement in emotional eating and weight. When considering mediation results in the context of previous results the approach to mediation analyses and interpretation of bivariate correlations should be taken into account.

7.3.7 Mediation approach and considerations about bivariate correlations.

It is important to highlight that the approach to mediation analysis is a relevant aspect of the current research. As detailed extensively in Chapter Five, the mediation analyses technique employed was not the traditional approach as advocated by Baron and Kenny (1986). A significant strength of the analyses is that this traditional method was not used

because if it had been some significant findings would not have been elucidated. This is because the traditional method relies on significant bivariate correlations in the initial stages of analyses. This was not the case for five significant findings in this study. Specifically, the findings that would not have been found are those that show that weight related experiential avoidance served as a mediator of the 1-day ACTing on Weight group workshop on the variables of BMI, satisfaction with life and positive affect, and those that show that cognitive fusion served as a mediator of the 1-day ACTing on Weight group workshop for the variables of satisfaction with life and positive affect.

In considering the bivariate correlations it also seems that the results found in this study at Time 1 seem to be an anomaly within the context of the available literature because most previous studies do find a statistically significant correlation between emotional eating and weight. In this study it is believed that a non-significant bivariate correlations were elicited at Time 1 because the recruitment advertising explicitly invited people who were ‘struggling with emotional eating’ to participate. This means that compared to a broad general community sample, most people who volunteered to participate reported emotional eating at similar levels. The inclusion criteria was also listed as having lost weight of at least 5% within the last six months, so by default most people who participated were overweight or obese as compared to a broad general community of which some would have not lost weight recently and/or not be in the categories of overweight or obese. It is thought that together these factors resulted in heterogeneous emotional eating and weight measurements at Time 1 precluding the elicitation of a significant bivariate correlation between emotional eating and weight. In comparison, when emotional eating and weight change scores were correlated at Time 2, significant correlations were revealed. The reason for this is thought to be that after the intervention there was a wider range of emotional eating and weight scores as the treatment and control groups diverged. This explanation is based on theory and evidence as

recently presented by van Strien et al. (2012) who showed that the absence of extreme scores or “insufficient participants with extreme scores” (p. 277) within the spectrum of emotional eating can lead to a null finding of the impact of emotional eating. They concluded that emotional eating is predictive of weight “provided that the participants have sufficiently extreme emotional eating scores” (p. 277).

Both the approach to the mediation analysis and consideration of the impact of the sample composition has on the results, like the bivariate correlations, are examples of methodological considerations. The next section will explicate a number of methodological considerations and strengths encapsulated within this study. From here limitations will be outlined, followed by the theoretical and practical implications of the study.

7.4 Methodological considerations and strengths

With regards to the methodological design considerations of this study there are a number of strengths to this research when compared to previous studies. These include: (a) nurse measured height; (b) nurse measured weight, as opposed to self-report weight which is not uncommon in the weight loss maintenance literature; (c) nurse measured waistline; (d) the randomisation procedure that was set up by an independent third party and implemented by the research nurse so that the primary researcher could not unintentionally bias the process; (e) the permuted block randomisation design; (f) the pre and post measurement of variable; (g) the employment of psychometrically reliable and valid measures of psychological constructs that have not previously been measured together; (h) the employment of psychometrically reliable and valid scales that uniquely measure emotional eating; (i) the weight loss criteria for participation being based on the current clinical evidence that shows a loss of 5% is helpful for health improvements; (j) the weight maintenance criteria boundaries being equal to the most comparable study; (k) the eligibility criteria including people with BMI in the healthy range or above to capture people who may

have fallen within the healthy range after weight loss; (l) the employment of a broad range of recruitment strategies to elicit a broad community based sample; (m) the delivery of the 1-day ACTing on Weight group workshop to all participants regardless of randomisation to the treatment or controls group by the end of the study; (n) that a pilot workshop was run with a convenience sample of clinical psychology doctoral students to test the face validity of the intervention content; (o) providing an explicit account of the underlying theoretical model and therapeutic treatment targets of the ACT intervention; (p) planning statistical analyses to explore the theoretical underlying mechanism of action in the intervention; (q) the study design being a prospective, and a controlled trial. A number of these points are worthy of individualised discussion, which occurs next, followed by a discussion of limitations.

7.4.1 Parameters of weight loss maintenance and current weight loss inclusion criteria. At the time of this studies design there was no consensus within the literature about what constitutes weight loss maintenance in terms of the amount of weight lost and the time during which it had been maintained (Ohsiek & Williams, 2011). An underlying aim of this study was to make it comparable to the ACT based research that had come before it and also to improve on the heterogeneous nature of the weight loss maintenance literature (Barte et al., 2010; Stubbs et al., 2011; Stubbs & Lavin, 2013). In this way the parameters used in this study were guided by Lillis et al. (2009) while also informed by the wider literature. Within this context it is believed that the inclusion criteria of 5% weight loss within the last 6 months was valid, as was the maintenance criteria of $\pm 2.3\text{kg}$ (Bray, 2013a; Lillis et al., 2009; NMHRC, 2013; St Jeor et al., 1997).

7.4.2 Employment of psychometrically reliable and valid measures. A significant common limitation of the previous empirical studies exploring emotional eating and weight loss maintenance is the underutilisation of reliable and valid psychometric measures (Teixeira et al., 2005). Therefore, the current study employed numerous measures

deemed as being the most psychometrically reliable and valid at the time. By doing this for each main variable of interest this study contributes novel psychometrically sound information to the emotional eating and weight loss maintenance literature. The results show also that when such measures are used they are more likely to elucidate predictive variance than when not used (e.g. Byrne et al., 2004). Another reason why using psychometrically reliable and valid measures is important is so that authors and readers of the literature can share a common understanding of how constructs have been measured, that there is a transparency around what has been measured and the subsequent interpretations of results. As an extension, this transparency of measurement can also highlight areas of improvement, as is the case in this study where scales that uniquely measure emotional eating were employed as opposed to scales that measure more than just emotional eating.

7.4.2.1 *Employing scales that uniquely measure emotional eating.* The literature detailed in Chapter 2 revealed that emotional eating is often measured using the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) and its revisions which measure emotional eating as part of disinhibition or internal disinhibition subscales.

The problem with this subscale is that it includes both emotional eating items and *dichotomous thinking items* (Niemeier, et al., 2007). This means that the unique contribution that these related, yet distinct, psychological constructs may account for within the weight loss maintenance equation is being obstructed, and therefore the unique contribution of emotional eating is often obstructed. For example, when Teixeira et al. (2010) did include a scale that measured emotional eating uniquely (DEBQEE: van Strien, et al., 1986) they found that both emotional eating and flexible cognitive restraint (the inverse of dichotomous thinking) explained significant unique variance in the weight maintenance equation. In addition, Byrne and colleagues (2002; 2003) found preliminary evidence that emotional eating and dichotomous thinking may predict weight loss maintenance, but when a non-

psychometrically sound measure of emotional eating was employed alongside a psychometrically sound measure of dichotomous thinking emotional eating was not found to be a significant predictor.

These two examples show that including scales that uniquely measure emotional eating is imperative if the unique variance that it may account for in the weight loss maintenance equation is to be found. In response the design of this study paid particular attention to including scales that uniquely measure emotional eating, and this is a significant strength of the study.

7.4.3 The explicit account of the theoretical underpinning of the intervention. It has recently been observed that there is a distinct lack of reporting of the “underlying theoretical approaches to intervention development” in the weight domain, and when it is reported it is often vague. (Akers et al., 2010, p. 1520; Barte et al., 2010; Elfhag & Rossner, 2005). This is problematic because when the underlying theory of an intervention is ambiguous it restricts study replication and extension, hinders treatment refinement opportunities, and most importantly it limits the future implementation of an intervention. The underlying philosophies and theoretical approach of the 1-day ACTing on Weight group workshop are explicit and transparent, and in the context of the general under-reporting of this, is a significant strength of this study.

A subsidiary strength of the 1-day ACTing on Weight group workshop protocol is that it would be easily understood and applied by interventionists trained in ACT, as many of the core ACT micro therapeutic exercises are included. It is also important to note that the 1-day ACTing on Weight group workshop protocol would not likely be effective if presented by a novice ACT therapist. This is because intimate knowledge of the ACT model is needed to be able to field questions from participants as they arise. The interventionist delivering the 1-day ACTing on Weight group workshop needs to be skilled in transitioning between the six

processes within the ACT model while also respectfully bringing participants back to the structure as provided by the intervention protocol. This point is mainly anecdotal and is based on the researcher's experience of running the 1-day ACTing on Weight group workshops.

7.4.4 Employment of a novel combination of psychometric measures. Another strength of the study is the employment of a novel combination of reliable and valid psychometric measures. This strength is an extension of the general methodological considerations made as discussed above. The measures employed in this study transverse the emotional eating, weight loss maintenance and ACT literature, and also included measures of subjective well-being which have been found to be broadly missing in weight loss maintenance studies (Akers et al., 2010). It is the first study to employ a measure of general experiential avoidance and weight related experiential avoidance along with a cognitive fusion measure. Further, it is the first study to employ these along with measures of emotional eating and weight loss maintenance. The result is a unique set of findings that explain yet unaccounted relationships between these variables.

7.4.5 Exploring mechanisms of action. An important strength of the study is its explicit exploration of mechanisms of action, especially emotional eating and its theorised underlying mechanism of action, avoidance. Elucidating underlying mechanisms of action are important because they point to tangible targets for treatment refinement. They also allow us to understand how an intervention is creating change. Exploring mechanisms of action through mediation analysis has become a championed cause within the ACT research fraternity because it “allows for a more complex analysis of treatment effect by examining the relation between processes of change and treatment outcomes” (Levin et al., 2009, p. 21). Researchers within the weight loss maintenance and emotional eating field have also called for mechanisms of action to be explored for treatment refinement, yet no other study has explored emotional eating's underlying mechanisms of action in the context of weight loss

maintenance (Byrne, 2002; Evers et al., 2010). The investment in exploring underlying mechanisms of action has paid off in this research as not only was experiential avoidance revealed as a statistically significant mechanism of action, supporting both the emotional eating and the ACT theoretical propositions, but cognitive fusion was also revealed as significant. Despite this study's many strengths, methodological considerations, and novel results, this study does have some limitations.

7.5 Limitations

The limitations of the study include: the length of follow-up; the contemporaneous assessment of the outcome and process measures; and attrition. Each of these is detailed next. Firstly, the three month follow-up period is not ideal in the context of long-term weight loss maintenance but at the same time is consistent with the literature to date (Lillis et al., 2009; Niemeier et al., 2012). Further, in the context of a non-funded pilot intervention study executed by a single doctoral student the study had inherent time constraints. In hindsight, the follow-up period could have been extended as the late additional data collection time as described in Chapter 5 could have accommodated a longer follow-up period. A longer follow-up period could have also facilitated an additional measurement point which would have eliminated the contemporaneous assessment of the outcome and process measures. Traditional mediation models hold that process measures, or mechanisms of action measures, should be measured before outcome measures so that change in the process measures can be seen as changing in the expected direction and in turn changing the outcome measures in the expected direction. The current analysis violates this temporality, but is consistent with much of the ACT research mediational analysis (Hayes et al., 2012). Further Forman & Herbert et al. (2007) highlight that where measures have been assessed contemporaneously, first “determining whether treatments produce change in the proposed mediator” (p. 17) before conducting mediational analyses strengthens the findings, which is the case in this study.

Another statistical consideration is that in this study ‘per-protocol’ analyses, also known as ‘present at follow-up’ analyses, were employed. This means that only data that was provided by participants at each point of the study was included in the analyses. This is one of two statistical options available when analysing treatment trial data. The other option is intention-to-treat analyses (ITTA) which statistically manipulates missing values of people who withdraw or are non-compliant with the treatment. The study goal determines which method is employed. In studies exploring under investigated variables and pilot studies like this study, explanatory goals are supported by per-protocol analyses (RMU, 2013). This type of analysis reveals treatment effects as intended by the protocol. Subsequent confirmatory research, also known as pragmatic research, can then employ ITTA to factor in issues like non-compliance to treatment. There are costs and benefits to both approaches. Per-protocol analysis is more likely to overestimate the treatment effect, and ITTA is more likely to underestimate the treatment effect (RMU, 2013). Given the context of this study as a pilot study that explores a combination of variables yet to be investigated, per-protocol analyses was employed. Future research analyses could include ITTA to provide confirmatory findings to this study. It is noteworthy that for between-group differences MANOVA analyses was employed, which is a more conservative option than others that could have been chosen, for example multiple ANOVAs.

The attrition rate of this study is a weakness, with $n = 54$ and $n = 57$ randomised to the treatment and control group respectively, $n = 43$ and $n = 56$ completed the pre-measures. The number who completed the post-measures were $n = 28$ and $n = 32$ for the treatment and control group respectively. Attrition rates are generally considered notorious within the domain of weight research. Moroshko, Brennan and O’Brien (2011) recently conducted a meta-analysis exploring the factors that might be contributing to high attrition rates and found no consistent patterns to help attenuate this problem, and say more attention within research

studies needs to be collected to help solve this issue. Of the 71 studies collated by Moroshko et al. (2011) they provided explicit details of 45 which reported attrition rates. Of these 45 studies the most common attrition rate was between 20-30%, followed by 50-60%, followed by 30-40%, followed by 40-50%. Similarly, in their review of the weight literature including 121 studies Stubbs et al. (2013) found that the average attrition rate was 37%. The results for the ACT based studies are mixed. For example Forman et al. (2009) reported an attrition rate of 52%, Niemeier et al. (2012) 14%, and Lillis et al. (2009) 3%. These previously reported attrition rates provide context for this study. Ideally the attrition rate in this study would be lower. Future research could enact the suggestion by Moroshko et al. (2011) and build into the research design a measure to capture reasons for attrition, and this could reveal specific factors contributing to participant attrition. It is important to acknowledge that an implication of attrition in this study is that ACT may not have been effective for those people who did not return at the follow-up stage.

The generalisability of the results from this study beyond the sample composition of Caucasian, middle-aged, middle-class women is also a limitation. In this study the sample composition was 96% female (100% female completers), 87% were born in Australia, New Zealand or England (80% Australia), 90% reported English to be their native language, with a mean age of 44 years old, 60% had at some point reached their ideal weight, 16% were currently using a weight maintenance program, 21% were currently using a weight loss club with Weight Watchers International Inc. being the most common program/club. Thirty seven percent of participants' household income was between \$50,000 - \$100,000, with 26% below this and 36% above this. Mean baseline weight for this study was 80.76kg with a mean BMI of 30.11, and waistline of 99.5cm. The percentage of participants who tried to lose weight between 10-20 times was 48%, and the percentage of participants who tried to lose weight over 20 times was 29%. This is not dissimilar to Lillis et al. (2009) who reported that the

composition of their sample was 90% female, 92% Caucasian, with a mean age of 51yrs, approximately 50% had at some point reached their ideal weight, 38% were currently engaged in a weight loss maintenance program with the most common formal program being Weight Watchers International Inc. Fifty six percent of participants' household income was between \$50,000 - \$100,000 with 14.5% below and 23.5% above this. Mean baseline weight was 201.4lb (91.35kg) with a BMI of 33. Both this and the study by Lillis et al. (2009) conform to the general composition of participants who volunteer for weight related research and findings are generally limited to the population as defined here.

Taking into consideration limitations and strengths, and extending previous research, is important for furthering research knowledge. Possible extensions of this research are presented next.

7.6 Extensions for future research

Five potential extensions for future research were considered worthy of mention. Two have already been discussed 1) extending the statistical analyses to include ITTA, and 2) conducting analyses to measure experiential avoidance and cognitive defusion together as well as separately. Three further extensions are noted below.

7.6.1 Refine the measures. As already stated, this study employed a unique combination of psychometrically reliable and valid measures. Specifically, in response to the limited number of psychometrically valid and reliable measures of emotional eating in the context of weight loss maintenance, this study employed three separate emotional eating measures to gather a baseline understanding of the impact an ACT intervention may have on emotional eating. The results showed that the 1-day ACTing on Weight group workshop improved emotional eating scores on each scale. Given that each scale was found to be significant (see Chapter Six), the relative strengths and weaknesses of including each scale in subsequent research should be explored. At this stage the results are too general to delineate

which scale would be the most meaningful to include if only one were chosen. In contrast the results of this study do suggest that using the general experiential avoidance measure (the AAQII, Bond et al., 2011) may not be as beneficial as using the specific weight related experiential avoidance measure (the AAQW, Lillis & Hayes, 2008), and thus the AAQII may be considered superfluous in future research.

7.6.2 An online component. It is generally accepted that face-to-face based treatment interventions are more costly than other forms of remote interventions like online contact through emails, on-line groups or forums. In the context of the growing trend toward providing on-line based treatments, for example beyondblue's and KidsHelpline's online counselling service options, it is plausible to suggest that the current study's design could be extended to include an exploration of the increased impact that an additional on-line follow-up component could have on emotional eating and weight loss maintenance.

This is suggested in the context of one recent study showing that email contact facilitated weight loss maintenance. Thomas, Vydelingum and Lawrence (2010) found in a RCT comparing email contact with no contact over 6 months with people who had lost at least 5% body weight showed that the email group maintained significantly more weight than the no-contact group and that the control group regained more weight. Email contact constituted a 'Tip of the Week' from a dietician and contained traditional behavioural strategies information; email contact was not reciprocal and participants were encouraged not to respond to emails. Participants in the study reported that the email tip was "a jog to the memory" which was interpreted by the authors as facilitating behaviour change (p. 36).

This study also had low attrition rates, 4% in the intervention group, which the author interpreted as potentially "reflecting the value participants have on continued support and the relationship with the researcher, which was maintained despite the lack of face-to-face contact" (p. 37). These two points are relevant for this study because during the follow-up

assessment there was a general consensus reported verbally by participants that they would have liked some sort of on-going contact with the researcher to help them implement the skills they learnt. Further to this a recent systematic review and meta-analyses of the literature ($n = 11$) on the effect of extended care on maintenance of weight loss was conducted by Middleton, Patidar and Perri (2012) who found that when extended care was provided it produced an additional 3.2kg weight loss over 17.6 months post-intervention compared to control. Overall they found that treatment based contact by the interventionist is a critical factor as contact made by non-interventionist or simply peer-support was not shown to be effective. In addition to this, most commercial weight loss programs now also provide on-line options. In considering this information together it is not a stretch to think a future study could explore the effectiveness of on-line components to further improve emotional eating and weight loss maintenance.

7.6.3 Maintenance first or second? A maintenance first, before weight loss approach could be explored also. This proposition stems from a recent randomised trial that found learning ‘stability skills’ before weight loss improved weight management (Kiernan et al., 2013). The ‘stability skills’ covered a range of skills that can be described as traditional weight loss behavioural strategies, including balancing energy intake and energy expenditure, self-weighing, and also included some mindfulness activities.

Those who learnt stability skills first regained less weight than those who lost weight first. This is a proposition very recently considered by Lillis & Kendra (in press) also. In a review of the literature exploring the evidence of the effectiveness of ACT interventions for weight control Lillis & Kendra (in press) highlighted that ACT for weight could be useful as either a *maintenance first* add-on treatment for traditional weight loss interventions, or an integrated combined approach, or a *maintenance second* approach as found in this study as well as in Lillis et al. (2009). Lillis & Kendra (in press) provide an analysis of the obstacles

that present themselves when an integration of traditional weight loss interventions and ACT strategies are considered. Distilled, the obstacles relate to the divergent treatment targets and mechanism of action that mean it would be hard to provide a fully integrated approach. Lillis & Kendra (in press) conclude that a *maintenance second* approach is probably most likely to be effective and further, most of the evidence showing ACTs effectiveness in the weight loss maintenance area including this study have used a *maintenance second* approach. A *maintenance second* approach also appears as though it would be more time-effective than integrated approaches, already detailed, that range between 12-40 weeks. Further the cost of a 1-day *maintenance second* approach is also likely to be less. Despite these conclusions, it would be prudent to empirically explore the differences between a *maintenance first* approach, compared to the *maintenance second* approach.

Throughout this discussion theoretical and practical implications have been partly detailed. The following section explicates the most significant theoretical and practical implications stemming from the results of this research.

7.7 A Summary of this Study's Theoretical Underpinnings and the Theoretical and Practical Implications of the Results

Emotional eating thwarts successful weight loss maintenance efforts because it involves eating that occurs for reasons other than genuine physiological hunger, caloric need or nutritional requirements, which results in energy excess and promotes weight gain. When the theories of emotional eating are reviewed as a collective, the potency of avoidance as the common theoretical mechanism of action underlying emotional eating is apparent. As detailed in section 2.6.1, the psychosomatic theory of obesity (Kaplan & Kaplan, 1957) and Bruch's theory (1973) espouse that eating alleviates negative emotions. The affect regulation models explain how negative reinforcement alleviates negative emotion (Hawkins & Clement, 1984). The escape theory explains how eating is used as an escape mechanism to

avoid aversive threats to the ego. Explanations based on attachment theory state that eating is used to regulate and avoid emotion in the absence of more helpful attachment based strategies (Levitan & Davis, 2010). The addiction model also explains that food or eating is used to improve mood and avoid negative experiences (Levitan & Davis, 2010). Theoretically, avoidance drives emotional eating.

Avoidance has been conceptualised as experiential avoidance within the ACT therapeutic model; in similar fashion, the ACT model and emotional eating theories propose avoidance as a potent common underlying mechanism of action in the development and maintenance of distress. Experiential avoidance is theorised as a psychological process whereby people engage in a struggle to avoid, suppress or change the form or frequency of their difficult private experiences involving thoughts and feelings. Consistent with the theories of emotional eating, ACT theory (Hayes et al., 2012, detailed in section 3.1) explains that avoidance strategies are usually maintained because of the immediate perceived benefit of ‘feeling better’. This short-term benefit of relief acts as a reinforcer despite the long-term disadvantages of avoidance. In the long-term the originally avoided stimuli returns and is amplified perpetuating a vicious cycle of avoidance. In a nutshell, emotional eating and ACT theories explain that people develop and maintain reliance on emotional eating because of its immediate function of making them feel better by avoiding difficult internal experiences. The theories are also congruent in explaining that people continue to use emotional eating because more helpful, adaptive or functional emotional regulation and/or coping strategies have eluded them. Remaining congruent in their treatment approach both emotional eating and ACT theories propose that people will experience improvements in outcomes if they learn and implement non-avoidant style psychological strategies to help them cope with difficult internal experiences.

In the formulation of this research, the problem of low rates of successful weight loss maintenance and explanations of emotional eating were linked together with an ACT therapeutic intervention as follows:

- Emotional eating ‘should’ be a target of treatment to improve weight loss maintenance rates because it involves eating for non-physiological reasons and therefore promotes weight gain.
- Emotional eating theories and limited empirical research identify the underlying mechanism of action, driving emotional eating, as avoidance.
- The targeting of avoidance via a psychological treatment intervention to improve outcomes could provide answers to the question of *how* to target improvement in emotional eating and weight loss maintenance.
- The problem of avoidance in the development and maintenance of distress is an explicit treatment target of ACT therapeutic treatment interventions.
- Emerging literature shows that ACT might be helpful for weight and weight related variables.

In early 2009 when this research study was considered, there was one published treatment intervention trial that used ACT to explicitly target avoidance in the context of weight loss maintenance. Lillis et al. (2009) hypothesised that improvements in weight related variables could be improved by targeting avoidance as a common underlying mechanism of action as subsumed within the ACT therapeutic treatment intervention model. This approach provided an alternative to the traditional interventions that focus on teaching overt behavioural weight loss strategies but neglect the psychological processes that enable people to consistently engage in helpful health behaviours.

The results from Lillis et al (2009) indicated that a 1-day ACT group based workshop was effective in improving weight loss maintenance – among other weight related variables –

and identified experiential avoidance a significant underlying mechanism of action. These results are consistent with the ACT theory that experiential avoidance is a key driver in the development and maintenance of unhelpful behaviour. Specifically, Lillis et al. (2009) described their results as providing evidence that “when an ACT model of weight problems is applied... it produces outcomes and process effects that comport with the underlying model” (2009, p. 68). These results validate both the effectiveness of an ACT intervention in improving experiential avoidance and the theoretical underpinning of the ACT therapeutic intervention model. In supporting the validity of the theory that experiential avoidance is a significant underlying mechanism of action that can be targeted for improvement in weight, Lillis et al. (2009) also provided the foundation for complimentary theories of avoidance to be considered in developing research. As an explicit extension of Lillis et al. (2009), the current research incorporated emotional eating based on the observation that ACT interventions target avoidance as a core common underlying mechanism of action and that the common underlying mechanism of action across all the emotional eating theories is avoidance. Amalgamating the exploration of emotional eating in the context of an ACT intervention was a novel research combination at the time these theoretical links were first articulated. This combination in the wider context of poor weight loss maintenance rates continues to be novel. This study also provides another explicit and novel extension to the previous research by exploring the extent to which an ACT therapeutic intervention can target and change cognitive fusion for improvement in emotional eating and weight loss maintenance.

Within the ACT model experiential avoidance and cognitive fusion are the two core common underlying mechanisms of action. Cognitive fusion is a process wherein people get caught up in their automatic thoughts which dominate their behaviour instead of consciously choosing how to act; the unwanted internal dialogue unintentionally yet automatically

promotes suppression and avoidance and restricts valued action. ACT theory proposes that by targeting experiential avoidance and cognitive fusion as the two core mechanisms of action in the ACT model improvements in outcomes will result. The current study was based on this claim and aimed to extend the empirical evidence to show that decreasing cognitive fusion may also improve weight related outcomes, specifically emotional eating and weight loss maintenance. The existing empirical and conceptual link between emotional eating and cognitive fusion is not explicit in the published literature, and the combination appears to be novel, however there is a general consensus that rigid or inflexible thinking styles are related to unhelpful eating behaviours (Teixeira et al., 2010). As already detailed earlier in this discussion and noted in Chapter 2, two previous studies show that dichotomous thinking may provide significant variance in the emotional eating and weight loss maintenance equation and that there may be conceptual and measurement overlap between dichotomous thinking and cognitive fusion (Gregg et al., 2011). Together these observations provide a solid rationale for extending the empirical research by including a quantitative measure of cognitive fusion, together with experiential avoidance, to explore yet unaccounted for variance in the emotional eating and weight loss maintenance equation.

At the macro level the results of this study support the theoretically-derived propositions that an ACT treatment intervention is likely to be helpful for emotional eating and weight loss maintenance, as well as related subsidiary variables. The results provide support for the ACT model by showing changes in the expected direction for all variables, changes that resulted from the ACT treatment intervention targeting common underlying mechanisms of action. This is important for the theory of ACT, as it provides some validation of the theoretical proposition that, it is the common underlying mechanisms of action that develop and maintain distress, and if these can be targeted and changed in an ACT therapeutic intervention, improvements in outcomes are likely. Where the main effects

provide support for this proposition, the significant mediation outcomes provide explicit empirical evidence to validate the ACT treatment intervention model that purports that targeting common underlying mechanisms of action *is* the key to change. This is important because the global theoretical premise of ACT treatment interventions is that they work via targeting and changing the common underlying mechanisms of action, instead of targeting problem specific content. More specifically the results validate the theory underlying this research by showing that targeting common underlying mechanisms of action is helpful for emotional eating and weight loss maintenance. Even more specifically, the results provide novel confirmatory evidence that cognitive fusion, as well as experiential avoidance, can be targeted and changed for improvements in outcomes, as expected by the ACT treatment intervention model, yet to date empirically unvalidated. Few published empirical findings exist to provide confirmatory evidence for the theoretical proposition that cognitive fusion is a key driver in unhelpful behaviours.

Finding that both weight related experiential avoidance and cognitive fusion are significant mediators is important for the theoretical underpinnings of ACT because experiential avoidance and cognitive fusion are purported to work alongside each other to contribute to the four other unhelpful and destructive ACT process. The results of this study provide evidence for the theory that these variables *do* work alongside each other. More specifically the results support the theoretical proposition underpinning this research that experiential avoidance and cognitive fusion are likely playing a role in emotional eating and weight, as well as subsidiary health and subjective well-being variables.

The results of this study also elicit subsidiary theoretical implications. Most significantly, for the problem of low rates for weight loss maintenance, the results of this study show that improvements can be made without any focus, or content being provided, on traditional behavioural weight loss or weight loss maintenance strategies. As noted earlier,

this finding confirms the a priori theoretical knowledge that most people know what they need to do to lose and maintain their weight using traditional behavioural strategies but lack the psychological skills required to continue these behaviours when they invariably encounter difficult and unwanted experiences. Also, as mentioned earlier, the extended consequence of this is that traditional behavioural strategies do not need to be rethought, reinvented, or repackaged; instead complementary psychological skills for weight loss maintenance need to be promoted as an adjunct to traditional behavioural strategies.

Another theoretical implication of this research is a potential reduction in the need to take into consideration the specific differences and idiosyncrasies of each of the individual emotional eating theories in case conceptualisation and treatment formulation, and instead a focus on the common underlying mechanisms of action at play in emotional eating and weight loss maintenance should be promoted. The results of this study are the first to show that a psychological intervention can produce improvements in emotional eating and weight loss maintenance by focusing solely on common underlying mechanisms of action. This means that instead of formulating treatment plans in terms of an individuals' emotional eating in relation to any one particular emotional eating theory or knowing in detail the predisposing, precipitating and perpetuating factors of their emotional eating, it is instead enough to know that weight related experiential avoidance and cognitive fusion are underlying mechanisms of action and if targeted in treatment, is likely to be helpful.

Within the context of the broader ACT literature the findings of this research provide more evidence that ACT is theoretically and practically applicable to a wide range of weight related problems and more generally health related concerns. For example, there is now evidence that ACT is likely to be helpful for weight, food cravings, bariatric surgery, binge eating, disordered eating and both clinical and non-clinical weight categories, and this study now adds emotional eating to this list (Barnes & Tantleff-Dunn, 2010; Juarascio et al., 2010;

Lillis & Kendra, in press; Masuda & Latzman, 2013; Weineland et al., 2012). Even more broadly, there is a growing list of a range of health related concerns that shows ACT can be helpful, for example in the areas of diabetes, smoking, “chronic-pain, obsessive-compulsive disorder, and a subset of other anxiety disorders (panic disorder, social phobia, and generalised anxiety disorder” (Gifford et al., 2004; Gregg et al., 2007; Smout, et al., 2012, p. 97).

The addition of this study’s results also adds to the growing list of positive results that can be seen to contribute to supporting the theoretical proposition that ACT is a transdiagnostic intervention. As outlined in section 3.5, ACT is theorised to be a transdiagnostic intervention because it targets common underlying mechanisms of action instead of targeting specific problem content. ACT treatment interventions are purported to be unbound by disorder specific diagnosis and treatment planning and instead transcend these limitations to enable application to a wide range of problems. By showing that the ACT treatment intervention in this study did change the proposed common underlying mechanism of action to improve outcomes it adds to the growing evidence that supports the proposition that ACT is a transdiagnostic intervention.

In light of the increasing evidence supporting ACT as a transdiagnostic intervention coupled with this study’s results and previous results showing ACT is helpful for weight related areas it is theoretically possible that an ACT intervention may also be applicable to the overarching general problem of obesity and overweight. For example, if emotional eating is associated with overeating and the overconsumption of food which has been shown to be related to higher BMIs, then decreasing weight related experiential avoidance and cognitive fusion and increasing acceptance and defusion skills that do not involve eating, the rates of overweight and obesity may be able to be reduced. Further, it is also possible that these changes could also be applied to other weight related health behaviours that are often listed

alongside emotional eating as being associated with both weight loss and weight loss maintenance and conversely the initial development and maintenance of overweight and obesity. For example, recently Thomas et al. (2011) cumulated the NWCR findings to list the top seven behaviours of successful weight loss maintenance, which are also analogous with initial weight loss. This list included emotional eating (as described as internal disinhibition) and together it included four diet related behaviours, two physical activity behaviours and self-monitoring. The findings of this study have shown that an ACT treatment intervention, and specifically decreases in weight related experiential avoidance and cognitive fusion, were able to change one of the dietary intake behaviours on this list, thus it is reasonable to speculate that the same intervention could also change the other critical behaviours listed.

While the majority of the theoretical implications of this study's results are quite simple and easily translated into tangible practical implications, there are some theoretical developments stemming from this study that act to complicate the current literature and provide important considerations for future research.

The first is the separate measurement of experiential avoidance and cognitive fusion in this study within the current context of ACT being promoted to as a unified model of behaviour change that targets 'psychological flexibility', a concept that subsumes the six ACT mechanisms of action including experiential avoidance and cognitive fusion, as extensively outlined in section 3.2. Referring to experiential avoidance and cognitive fusion separately, as done in this study, does not conform to the current trend in the literature that is moving to focus on psychological flexibility. However the current literature can still be found to refer to experiential avoidance and psychological inflexibility interchangeably. For example, the most recent version of the AAQII as used in this study, and the most widely used ACT specific psychometric measure, is referred to as a one-factor measure of

psychological inflexibility or experiential avoidance (Bond et al., 2011). Anomalies such as this can be seen to perpetuate the interchangeable use of the terms in literature and research.

The solution to this potential problem of knowing whether to refer to the six separate processes or to the unified concept of psychological flexibility is further contributed to by the ever increasing number of specific and discrete ACT process measures being developed and used in research like the Cognitive Fusion measure (CFQ28) used here, and the recently validated values questionnaire, the Valuing Questionnaire (Smout, Davies, Burns, & Christie, in press), and The Dixel defusion scale (Forman & Herbert et al., 2012) The emergence of process specific measures raises the following questions: 1) If the AAQII is defined as a measure of experiential avoidance, then does measuring it along with other psychometric measures that measure discrete ACT processes rule out measurement and conceptual overlap?; 2) If instead however, the AAQII is defined as a measure of psychological inflexibility or its inverse psychological flexibility (that subsumes the six processes in the ACT model) does that render other specific and discrete ACT process measures superfluous, and rule in measurement and conceptual overlap? The solving of this theoretical problem is unable to be advanced by the results of this research. Instead the results are viewed within the context of the growing number of specific process measures which highlights that attention may need to be paid to the unique contribution that each measure accounts for, and whether the six distinct processes within ACT are focussed on in quantitative measurement or instead a unified measure of psychological flexibility is used. This point corresponds to the earlier note that there is an opportunity for future research to explore the unique and concurrent predictive value that both weight related experiential avoidance and cognitive fusion contribute to outcome measures.

With regards to measurement and conceptual overlap, it is also important to reiterate the need for future research designs to consider two already mentioned areas of measurement

and conceptual overlap that have emerged during this research that may be obscuring knowledge about the variance that can be accounted for in the emotional eating and weight loss maintenance equation, 1) the overlap between emotional eating and dichotomous thinking in some scales 2) the potential overlap between measures of cognitive fusion and dichotomous thinking.

Taking these few peripheral theoretical considerations into account sooner, rather than later, are likely to advance developments in potential solutions for the weight loss maintenance problem faster.

The practical problem that provided the impetus for this research is the problem of low rates of successful weight loss maintenance. The collective literature highlights that emotional eating should be targeted to help improve the low rates of weight loss maintenance, however few authors provide insight into *how* decreases in emotional eating could be achieved. This is the first study to show that emotional eating can be improved via targeting the common underlying mechanism of action avoidance, as defined in this study as experiential avoidance, and that targeting cognitive fusion is also helpful.

The results of this study show that when people are taught new psychological skills to redress their avoidance, they are able to improve their emotional eating and weight outcomes and they do not need any further instruction in traditional weight loss maintenance behavioural strategies. As noted earlier, the implication is that current weight loss interventions probably do not need to be overhauled, reinvented or repackaged. Instead an emphasis on the understanding of the underlying psychological processes that act as barriers to the implementation of traditional behavioural strategies should be promoted and taught as an adjunct to traditional behavioural strategies and incorporated as a treatment refinement. Further a focus on psychological skills for weight loss maintenance as opposed to new

interventions aimed at the initial weight loss stage are more consistent with the evidence that most people can lose weight but 80% regain lost weight.

The results of this study provide explicit and tangible targets for treatment refinement for both emotional eating and weight loss maintenance which are consistent with the theoretical understanding of these problems, and further the answers are already encapsulated in an accessible therapeutic treatment approach, ACT. This means that the wheel of intervention refinement does not need to be reinvented, and instead ACT as an established treatment approach can be applied to emotional eating and weight loss maintenance. The intervention used in this study exemplifies this point because the generic ACT model, common ACT approaches, and common ACT exercises make-up the 1-day ACTing on Weight intervention. This is not dissimilar to other ACT interventions documented in the literature. A major implication of this could be cost savings in the reduced need to develop completely new interventions. Similarly, the transdiagnostic applicability of ACT within the weight related area as supported by this study, means that individuals experiencing problems along the spectrum of weight and unhelpful eating behaviour may benefit from the same ACT intervention. This could lead to further cost savings in both treatment development and delivery. Additional cost savings in the delivery of treatment could also be found in the fact that change in the outcome variables in this research resulted from a relatively short intervention. As noted earlier, compared to some interventions that run over weeks or months the intervention in this study was relatively short. It is also possible that in today's time-poor culture shorter interventions like the one in this research as opposed to interventions that span weeks could be argued to be more easily committed to by people in the general population and therefore easier to incorporate, and be effective, in public health settings.

The global practical implication of this research is that people *are able to learn* new psychological skills to decrease emotional eating and improve weight loss maintenance.

Specifically, the results indicate that the 1-day ACTing on Weight group workshop taught people how to change their relationship with difficult experiences, so that they were more able to engage in values based actions that provided fulfilment to their lives, and despite the presence of unwanted thoughts and feelings they were able to engage in workable health behaviours to decrease emotional eating and maintain their weight loss.

This research can be seen to begin to answer the question posed very early on in this thesis which was extracted from Byrne (2002) and articulated as ‘*what are the underlying psychological mechanisms that motivate or drive individuals to adhere to workable behavioural strategies to facilitate successful weight loss maintenance?*’ The findings of this research answer this question by showing that when people decrease engagement in avoidance, specifically weight related experiential avoidance and cognitive fusion, they are more able to reduce avoidance based behaviours like emotional eating and instead are more likely to be able to engage in adaptive coping and workable behavioural strategies that they know facilitate successful weight loss maintenance.

The results of this research show that it is possible to increase successful weight loss maintenance and decrease emotional eating by targeting common underlying mechanisms of action. More specifically, this research shows that two of those mechanisms of action appear to be weight related experiential avoidance and cognitive fusion, and both can be changed through an ACT therapeutic treatment intervention, which as a unified model, targets increases in psychological flexibility.

Simply, this research shows that by increasing people’s psychological flexibility they are able to decrease emotional eating and be more successful in their weight loss maintenance efforts.

7.8 Conclusion

Successful weight loss maintenance is one of the greatest challenges facing the field of overweight and obesity. Given the lack of current success and the high costs of unsuccessful weight loss maintenance, including increased morbidity and mortality, finding answers to the problem of low rates of successful weight loss maintenance is vital. This study aimed to find answers, and it found compelling evidence that weight loss maintenance rates may be able to be positively changed.

Within the literature there are consistent calls to improve weight loss maintenance outcomes by investigating hitherto underexplored psychological factors, specifically emotional eating in the context of psychological interventions. In 1973 Leon and Chamberlain stated that to improve weight loss maintenance, people need to learn *how* to limit eating in response to emotions. Similar calls have been repeated more recently: psychological interventions “should focus on reducing emotional eating” (Teixeira, et al., 2010, p. 733); “psychological treatment strategies have to be developed to overcome emotional eating and thereby end the weight gain epidemic (Koenders et al., 2011 p. 1292). Despite these calls, to date there is no study published that explores emotional eating and weight loss maintenance in the context of a cutting edge psychological intervention that targets underlying mechanisms of action.

The completion of this study and its subsequent publication will see it crowned as the first study to quantitatively bring together an ACT intervention and its two core processes of experiential avoidance and cognitive fusion to provide an innovative new way to positively impact people’s lives through the reduction of emotional eating and the facilitation of successful weight loss maintenance.

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Appendices

Appendix A:
Recruitment Poster



RESEARCH PARTICIPANTS WANTED

Weight loss maintenance

*Does emotional eating ruin your weight loss efforts?
If so ACT now...*

You are invited to participate in a Monash University research trial: **ACTing on Weight Maintenance**

There are no pills, shakes or diet plans. Instead we are exploring Acceptance and Commitment Therapy (ACT), a psychological intervention, for weight loss maintenance and emotional eating.

You may be eligible to participate if you are over 18 years-old and have recently lost weight. To participate please contact trial co-ordinator [REDACTED]

All participants will receive a small financial contribution toward travel expenses incurred by attendance at the workshops.

All participants will go into a draw for a \$50 David Jones voucher

Ethics approval granted by Monash University Human Research Ethics Committee no. CF09/2473 – 2009001435

Appendix B:
Women's Health Magazine Article

Our Biggest Issue Ever!

WIN
An Eat, Pray, Love
Trip to Bali
Worth \$10k

Women's Health

It's Good To Be You™

SLIM & TONED now!

THE WORKOUT THAT FIRMS YOU UP ALL OVER - IN JUST 4 WEEKS

Lose Weight in One Day

A New Expert Plan that Really Works

Have Electric Sex Tonight!

Stress-free Skin

Banish the Blemish

81 THINGS TO INSTANTLY BRIGHTEN YOUR DAY

(You'll smile, laugh, wet your... well maybe not)

4 Exercises For Hot Legs

PLUS the shorts to show 'em off

RESHAPE YOUR LIFE IN 31 DAYS

- ★ DETOX YOUR WORK LIFE
- ★ REWIRE EMOTIONAL HEALTH
- ★ UPGRADE YOUR FITNESS

By Guest Editor
Michelle Bridges

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PSYCH SLIM D



Two years ago a small but significant study was done.

Forty people who had repeatedly tried and failed to lose weight did a day-long workshop on acceptance-commitment therapy (ACT) techniques. A second group of wannabe slimmers did a gym workout instead.

Three months on, the workshop participants had lost more weight, were more active and said they were much happier, too. So what the hell did they learn in *one day* that was more successful than any weight loss program they'd tried?

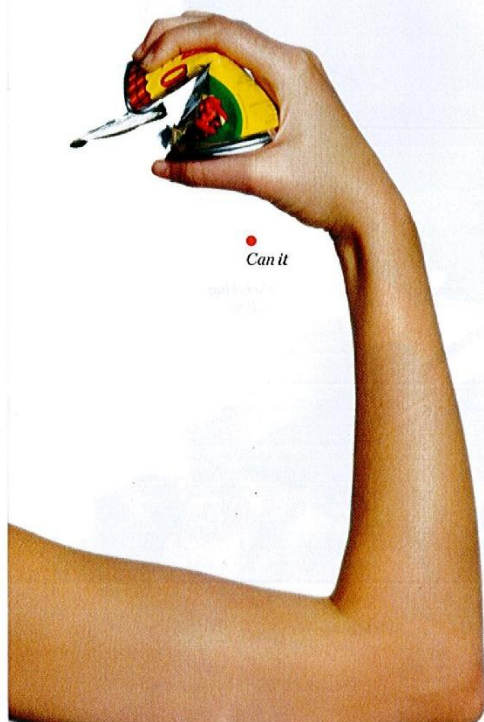
And how can we use it in our lives, please? Read on...



Since that 2008 study, other researchers have had similar results with ACT-based weight-loss programs. Last year Dr Katy Tapper, who researches mindfulness-based approaches to eating behaviour at Swansea University in Wales, gave participants four two-hour workshops in ACT principles. Six months later they'd significantly increased their physical activity, and reduced their BMIs and episodes of binge eating compared to controls. In short, there's mounting research that acceptance and commitment therapy (ACT), one of psychology's so-called "third-wave" mindfulness-based approaches, is helping people bulldoze unbending weight-loss barriers.

Dr Jason Lillis, a psychologist at the University of Nevada-Reno in the US, who ran that first study, isn't surprised. "People trying to lose weight are fairly burnt out on the process," he says, acknowledging that most dieters have tried many methods from counting kJs to food diaries to daily weigh-ins. "The ACT approach is a bit different. We said right from the start we didn't care if people [in the study] lost weight. What we focus on is that people have a life that's worth living; that feels important and vital to them. We want you to live well as defined by you, and the rest doesn't matter." Turns out, living well tends to translate into numbers dropping on the scale.

What you already know about exercise and nutrition is important, but it can take a mental makeover to put that knowledge into practice. Here's how Dr Lillis and his peers have coached people to approach several too-familiar weight-loss challenges with an ACT sensibility.



Challenge 1 FOOD IS EVERYWHERE

People know they want to lose weight, yet continue to make choices inconsistent with their goals, says Dr Evan Forman of Drexel University in the US, who's currently running the longest term study on ACT for weight loss to date. He blames the Western way of life, where food is available from pretty much anywhere. "Knowing that and because of the way we're biologically wired, we're constantly thinking about food," he says. "Very, very often it's going to occur to us that we want to eat something. Every minute we're not eating we have to put up with that demand in our mind to find that doughnut."

Losing strategy: eat less You know how it goes: by trying to limit what you eat, you see food everywhere. Psychologists call this "attentional bias", says Dr Tapper. And it's why she advises against old-school "dieting": "You try not to eat too much, but you're more likely to notice food, which in turn makes it more difficult for you to resist eating and so on."

ACTion plan: eat (and live) mindfully ACT takes a different approach. Rather than imposing strict limitations on what you eat, changing how you eat by cultivating mindfulness may work better. "That means paying attention to your thoughts, bodily sensations, the activity you're doing," says Dr Lillis. Research published in the *Journal of the American Dietetic Association* found people who've developed this skill lose weight or avoid putting it on by learning the distinctions between hunger, cravings, fullness and satiety. Dr Tapper's program taught participants to eat more mindfully. Here's how: as you place food in your mouth and chew it, think about the flavours and texture of the food. Don't get hung up in judging it – just notice it. Eating with a friend or partner? Try watching your mind as you interact with the people you eat with versus eating alone. Notice anything interesting? Write it down.

Challenge 2 SLAMMED CONFIDENCE

Angela Buntic, WH weight-loss expert and dietitian, believes it's often poor self-esteem that holds people back from their goals. "They believe they can't do it due to so many years of dieting and no success," she says. But of course – "diets don't work". And there's nothing like a can't-do attitude to scupper a goal.

Losing strategy: thought correction Some surprising news: challenging and changing your negative thoughts isn't as effective as you'd assume. Dr Forman compared a traditional cognitive behavioural therapy (CBT) approach to weight loss with ACT methods. "Basic CBT is supposed to help people by getting them to realise their thinking is unreasonable, irrational or distorted," he explains. "By appreciating that, you recognise and correct your thinking, and as your thinking changes, your emotions change and so do your behaviours." But psychologists have known for 20 years that attempting to control unwanted thoughts and emotions doesn't work for everyone. In fact it can even increase the frequency and duration – and make things worse. A 2005 study by Hamilton College in New York found participants who suppressed negative thoughts about themselves ended up feeling more anxious, depressed, and having lower self-esteem. That sounds like the makings of a chocolate binge to us.

ACTion plan: create defusion ACT doesn't ask you to change your thinking, just to become more aware that you're thinking, to help separate thoughts from reality. It also helps to label your thoughts, says Dr Tapper. She teaches this strategy: as feelings, bodily sensations or thoughts arise, mindfully note which category they fall into. Don't focus on content or description, just the category. For example, 'emotion', 'urge', 'bodily sensation', 'judgement', 'memory'. "Noticing that is a powerful habit of mind," says Dr Tapper. Try this for a few minutes. If you find yourself in long periods of silence, see if you've been hooked by a thought or feeling you've been following. Then come back to the exercise.



RESHAPE
YOUR
LIFE
IN 31
DAYS

Challenge 3 CONSTANT CRAVINGS

In the battle of a Violet Crumble versus your willpower, it's odds-on choc will win – especially if you're having a tough arvo. Emma Gallagher, who is running a study on ACT and weight loss as a doctoral candidate in psychology at Monash University, Vic, says, "Humans do things to avoid experiencing unpleasant emotions [like emotional eating], which appear to work in the short-term, but don't in the long run... The long-term consequences most likely include weight gain and the persistence of the root cause of the emotion they're trying to escape." Sad but true. So what's a better way to deal with a bad day or a random ice-cream craving?

Losing strategy: distract yourself Unfortunately – and unsurprisingly – a lot of research shows that the harder you try not to think about something the more you'll end up thinking about it. "People's natural reaction is either 'I have to eat' or 'I have to get rid of this craving,'" Dr Forman says. "Those are my two choices." That's unfortunate because you can't really get rid of a craving without eating, and the more you try to, the bigger it looms in your life."


ACTION plan: be willing to accept Here's where the A in ACT comes in. The goal is to recognise and accept unwanted or unpleasant thoughts and feelings. "If people can be OK with the experience of, say, anxiety or sadness, they don't have to eat to get rid of it," says Dr Forman. "The craving won't disappear, but it may be less troublesome than if you were to say 'I've got to completely suppress the thought.'" His study revealed that the people who ate more in response to emotions benefited most from this strategy. How to make use of it? Try Dr Forman's ocean metaphor: he likens cravings to waves, which swell and recede, then return. "If you say to yourself that at some point the water's going to rise up and I'm going to accept that, rise up with it and ride it out, you'll be in much better shape," he says. Surf that craving wave, baby. Yeah!

Challenge 4 SUSTAINING MOTIVATION

Anyone can start a regular gym class. But not everyone is still going after three months. Or years, never mind decades. "There are challenges associated with losing and keeping off weight," Dr Lillis says. "It's a life." So the big question: how can you maintain momentum – and a smaller dress size?

Losing strategy: peer pressure There's a lot of pressure on us to look a certain way. And weight-loss programs that hold people socially accountable for their progress – ie those with support groups or online chat rooms, have proven effective. But in the long-term, research shows people end up gaining back the weight – possibly when their peers stop checking on them.

ACTION plan: Commit to your values ACT suggests you ask yourself why you even care about losing weight, then zero in on what's really important in your life. "It's one thing to say, 'yes, I can put up with this urge I have a hundred times a day'. But why is it worth it to you?" Dr Forman asks. "You're going to be accepting things that are difficult. Something's got to keep you committed to doing that day after day." Buntic agrees, "A focus on weight does not create long-term healthy habits. Instead, set non-weight-related goals, like having more energy, jogging 4km, living a longer life – whatever it may be."

To figure out what matters most to you, try this exercise from Dr Tapper: Imagine you're in your twilight years reminiscing about life – which has turned out exactly as you wanted it (handy!). Close your eyes, take a few deep breaths, then recount this ideal life. What did you achieve? What did you work towards? How did others see you? What did you stand for? Jot down what you come up with. Areas that could be important include relationships, parenting, career, social life, pastimes, health, personal development or community involvement. Hey presto – there's the priorities that'll help you stick to your weight-loss goals. And a perfect life, on paper at least. What's not to love about that? 

Think
outside
the box

Appendix C:
Ultrafit Magazine Article

| head |

ACT Now: HOW ACCEPTANCE COMMITMENT THERAPY CAN HELP YOU REACH YOUR GOALS

Even the most dedicated athletes and fitness professionals can find it hard to maintain motivation. Whether it's losing those last few kilos to increase your performance, or encouraging your clients to maintain a healthy weight, there will be times when the going gets tough. How you handle those challenges is the key to your success and Acceptance Commitment Therapy (ACT) may be just what you need to succeed.

By Meghann Birks

WHAT IS ACT?

Emma Gallagher is a Doctor of Clinical Psychology Candidate at Monash University's School of Psychology and Psychiatry and is the trial coordinator for ACTing on Weight. Says Gallagher, "Acceptance Commitment Therapy is a psychological intervention designed to increase people's psychological flexibility, so that they are more able to handle the difficult thoughts and feelings that human's inevitably experience during their life."

People have a natural tendency to get caught up in and struggle with their negative feelings, which then limits them. Rather than fighting to change these feelings, ACT teaches you to accept them and work from there. "You accept that, as human beings, we have a range of emotions and thoughts and that's OK," says Gallagher. "It's about recognising these thoughts and feelings, and examining the behaviours they lead you to. Essentially, ACT is about mindfulness."

The commitment comes in when you commit to making choices based on what you value most in your life. "Goals are like the stepping stones on the way to your values," says Gallagher. "You can never tick a value off your list. If you want to be a healthy individual, for example, you will have to make choices on a daily, or even hourly basis that will move you toward that ideal, but the actions must be consistent."

ACT AND PEAK NUTRITION

Studies have shown that for many people the maintenance of a healthy weight is far more difficult than losing weight in the first place. As part of her research, Gallagher has identified emotional eating as one possible obstacle to weight loss maintenance. She is exploring the theory that unless people learn an

appropriate way of dealing with their emotions, they are likely to regain weight through emotional eating, and/or make poor food choices.

Even for people who are not aiming to lose weight, emotional eating can get in the way of a healthy, sustainable relationship with food and it is something that must be addressed.

To achieve peak nutrition, it is imperative that food choices are driven by the desire to fuel your body appropriately, rather than by your feelings. This is where mindfulness techniques are particularly important. Emotional eating is an automatic response, something people do without really thinking about the consequences.

ACT teaches you to accept the uncomfortable emotions - sadness, anger, boredom, exhaustion - and find different ways to deal with them. By looking to your values for guidance, you can make choices based on where you want to be and therefore avoid sabotaging your hard work.

ACT AND PEAK PERFORMANCE

If emotional eating and weight loss aren't an issue, ACT can also help you or your clients achieve more in their fitness training. By accepting that sometimes training will be hard and that there will be moments of discomfort, you can learn to embrace it and make it work for you. This can be the case even if you might not like or want to experience the discomfort. When people become more willing to experience difficult feelings - whether they're physical or emotional - they often aren't as limited by them as they previously were.

ACT can help deal with our thoughts that get in the way of our exercise efforts. For example, your clients may say, "I'm too tired today" but ACT teaches them that they can have that thought and act in the opposite way.

Explains Gallagher, "It's about tuning into your thought and deciding whether you want to act on that thought or not. You probably don't realise that you do this all the time. How many times have you woken up to your alarm clock and thought 'I really don't' want to go to work today so I am going to call in sick yet, in the end, you find yourself acting in the opposite way and going to work? It's about learning you can have a thought and still choose to act differently."

MAKE IT WORK FOR YOU AND YOUR CLIENTS

Use this practical example to help you and your clients get more from training.

An approach synonymous with Russ Harris, one of Australia's leading ACT trainers, is that of becoming mindful by adopting the persona of 'a curious scientist'. In this persona you intensely explore an unpleasant sensation instead of trying to get rid of it or avoid it (ie. by stopping your training session or changing activities when it starts to get too hard).

Step 1: Notice you have a feeling or sensation you have the urge to avoid, ie. discomfort or fatigue.

Step 2: Acknowledge the urge and choose to explore the sensation instead of avoiding it.

Step 3: Observe the sensation as if you are 'a curious scientist' who has never experienced this sensation before. Use some of the following questions to guide your exploration. Where is the sensation? Is it inside or outside of your body? Does it have edges? Where does it stop and start? If it had a shape what shape would it be?

If it had a colour what colour would it be? Is it heavy or light? Is it hot or cold? Is it moving or still? Don't think too hard about your answers to these questions. Go with your first answers, or your 'gut instinct'.

Step 4: Breathe into the sensation or breath into it and around it, whatever makes sense to you.

Step 5: Make room for the sensation and allow the sensation to be there. You don't have to like it or want it, just allow it.

Step 6: Notice you can have this sensation and continue your training.

Though this may seem strange or difficult at first, with practice it will become easier. You can then use this technique to explore unpleasant sensations related to other behaviours that you wish to address, such as emotional eating.

WANT TO GET YOUR CLIENTS INVOLVED?

If you think your clients may benefit from learning more about ACT, now is the time for them to get involved. The ACTing on Weight team from Monash University is currently recruiting adults who have recently lost weight to participate in research about weight loss maintenance and emotional eating. There are no diets, pills or shakes. Instead a FREE workshop is provided that aims to teach people new psychological skills designed to help them better handle difficult thoughts and feelings that may be contributing to their emotional eating and weight loss maintenance struggle. **ufm**



For more information see: www.actingonweight.com or contact Emma Gallagher

Appendix D:
Women's' Health and Fitness Magazine Article

NUTRITION • EXERCISE • WEIGHT LOSS • BEAUTY • WELLBEING

Women's health & fitness

Australia

VOL. 17 NO. 6
AUST \$7.50 INC GST
N.Z. \$9.80 INC GST

WIN!
A 7-day dream holiday to Fiji
See p.53 for details

WEIGHT LOSS FOR REAL WOMEN

HEART FRIENDLY HEALTH TIPS

10 solutions to common health dilemmas

BANISH emotional eating
You can do it!

The ultimate all-in-one workout

FRESH VS FROZEN
The surprising truth

Take your fitness to the next level

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nutrition

Emotional eating

Of all the psychological factors affecting when and what we eat, emotions are one of the strongest. **Jennifer Kang** investigates emotional eating – why and how it occurs and the best ways to combat its effects

After an emotional ordeal do you find yourself choosing comfort over nutritious virtue – a side of fries over roasted pumpkin, or cake over a handful of berries? Or do you, without second thought or hesitation, head straight for a bag of chips to relieve yourself of boredom, stress or sadness?

The tendency to resort to food in response to emotional triggers, particularly emotional distress, is identified as emotional eating and there's no denying many of us have at some point indulged in comfort foods in response to upsets at work or in relationships.

"In our modern world, where food is everywhere, where snacking is encouraged and where advertising overtly promotes emotional eating, we all eat emotionally," psychologist Louise Adams says.

However, while emotional eating may be an occasional and temporary way of seeking short-term relief, it can become troublesome both

psychologically and nutritionally if left to become a habitual way of dealing with emotional turmoil.

A closer look

Emotional eating occurs in the absence of physical hunger and according to psychologists, can be categorised as an 'avoidance coping' strategy.

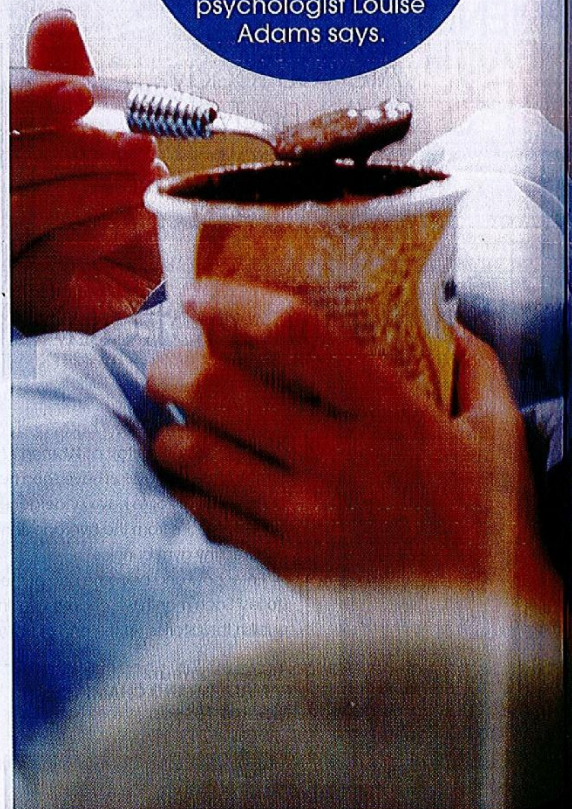
Emotional eaters typically eat food they enjoyed during childhood as well as high-fat or high-sugar snacks, which trigger a serotonin response in the brain, causing the emotional eater to experience pleasure while eating.

Doctoral candidate in psychology at Monash University Emma Gallagher is coordinating a study to help individuals struggling with their weight. She says many emotional eaters want to escape unpleasant emotions such as sadness or stress and instead of dealing with and addressing these emotions, eat to feel better, which seems to work in the short-term.

"But usually not for long – maybe a few minutes – so in the long-term, it isn't a very helpful strategy and actually tends to compound distress," Gallagher says.

Why we resort to food for comfort can

"Remember, we all emotionally eat, or eat when we are not hungry, some of the time. It's only a problem if it is interfering with the quality of your life or your health," psychologist Louise Adams says.



be attributed to our everyday methods of dealing with problems. When faced with a predicament, we feel inclined to fix the problem or eliminate it, but avoiding it is usually an easy and tempting option.

However, you're probably familiar with what happens when you avoid a problem you can't escape, and Gallagher says research shows avoiding internal experiences such as thoughts and emotions does not work and actually acts to increase original distress.

Those of us who eat to avoid a difficult situation or negative emotion feel better temporarily, but then feel worse because not only has the original distress not gone away, but additional distress has been added, usually in the form of guilt.

Discomfort on your plate

If you're piling your plate with guilty pleasures, you're also bound to be compromising the nutritious value of your eating patterns – an aspect of emotional eating that is given less attention than its psychological factors.

In emotional eating, comfort is always preferred over nutrition and this can lead to a range of deficiencies. Emotional eaters indulge in too much of one food group, typically fat and sugar-laden foods, which means they don't have a balanced and varied diet.

Emotional eating can also result in overeating.

"Given emotional eating is related to eating in the absence of physiological hunger, it is most likely that people who engage in emotional eating are eating more than their recommended

daily energy intake, which is likely to lead to weight gain and increases in body mass index," Gallagher says.

Gallagher says despite our occasional reluctance to accept BMI as an indicator of physical health, evidence shows there is an association between higher BMI scores and poorer health outcomes for individuals.

Emotional eaters are also at risk of becoming overweight or obese, which is related to developing or exacerbating health problems such as type 2 diabetes, cardiovascular disease and hypertension.

"I see lots of clients struggling with their physical health as a result of emotional eating – they have problems such as insulin resistance, diabetes and high blood pressure," Adams says.

Emotional eating is also one of the biggest triggers for binge eating and even bulimia. Uncontrollable eating habits can also result in reduced self-esteem and body image issues, which again contributes to the cycle of eating to feel better.

Combat the comfort

There are a range of ways to distract yourself from unpleasant emotions using non-food related methods. Go for a walk – this will release serotonin (happy hormones) in the brain, or engage in a soothing activity other than eating – listen to meditative music.

Another strategy to lessen the impact of emotional eating is to



nutrition

limit your portion sizes. Have a small piece of chocolate rather than a whole bar, enjoy it and indulge in it slowly and mindfully.

Gallagher calls this 'mindful eating' and says emotional eaters can challenge their eating habits by trying two minutes of mindful eating.

"Get one piece of chocolate and a stop watch and set the time for two minutes," she says.

Start by looking at the piece of chocolate from different angles and notice what happens after you put it in your mouth and chew it.

What were you thinking and feeling? Was it a long time or short time? Asking yourself these questions can combat mindless, emotional eating and allow us to engage in mindful eating habits. As a result, we eat less than we normally would in the given time frame.

Feel-good alternatives

If we go by the saying 'you

Are you an emotional eater?

To identify whether you're an emotional eater, Adams advises us to ask:

- ✓ Do you have a stash of secret food that you turn to when times are tough?
- ✓ If you are having a tough day, are you more likely to eat?
- ✓ Do you often eat when you are not hungry?
- ✓ Do you tend to eat in secret?
- ✓ Do you feel that your eating is out of control?
- ✓ Do you often eat until you are uncomfortably full?
- ✓ Do you feel guilty about your eating?



are what you eat', the food we eat can contribute to our mood and wellbeing, which means emotional eaters can select nutritional, feel-good alternatives instead of calorie-packed meals and snacks that elicit bad feelings.

Studies show that sweets and snacks can work to improve mood in the short-term, but do not aid in long-term wellbeing, but there's research to prove a healthy diet does. A recent study reported in the *Medical Journal of Australia* found adolescents who ate a healthy, wholefood diet were nearly half as likely to suffer from depression compared with adolescents who ate a nutritionally poor diet with a lot of fast foods and calorie-laden snacks.

According to experts, a diet rich in the amino acid tryptophan, which can stimulate serotonin, can boost mood and in the long run offers a healthy feel-good alternative to typical comfort foods. In her book *The Serotonin Secret* Dr Caroline Longmore advises us to search for foods high in amino acids, which trigger the body to produce tryptophan and make for feel-better eating.

Tryptophan-rich foods such as bananas, poultry, beef, eggs, cottage cheese, nuts, legumes and brown rice have been shown to boost serotonin and when combined with a wholesome diet and regular exercise, can stave off depression.

Omega-3 has also been found to reduce the likelihood of depression. Oily fish are a rich source of omega-3 and also contain B group vitamins, which can optimise brain health to make you feel balanced in mood and emotion.

But remember, don't over-indulge – eat these nutritious alternatives mindfully! 🌱



Smile and enjoy happier, healthier meals

Breakfast



Multi-grain bread with cottage cheese and one banana.

Or

Poached eggs, multigrain bread with homemade baked beans and a few pieces of pineapple.

Lunch



A can of tuna and grilled chicken salad with avocado.

Or

Turkey and salad sandwich on multigrain bread.

Dinner



Steamed fish (pick a deep-sea, oily fish such as salmon) with steamed vegetables and a side of brown rice.

Or

Beef and vegetable stir-fry.

Snacks



Sesame seed biscuits.

Or

A handful of Brazil nuts.

PHOTOGRAPHY: PHOTOLIBRARY/STOCKPHOTO/SHUTTERSTOCK

Appendix E:
Press Release 2011



Press Release

February 2011

ACTing on Weight

Tackling serious food issues without focusing on what people eat is an approach gaining momentum.

The recent explosion of interest within the popular media, both on TV and in print, does not surprise Monash University's ACTing on Weight researcher Emma Gallagher who is trialing a new psychological treatment for weight-loss maintenance, believing the method may hold the solution for hundreds of thousands of Australian's who find it difficult to maintain their weight after they shed unwanted kilos.

Since March 2010 members of the general public have been volunteering to participate in the ACTing on Weight research that includes attending a one day workshop focusing on emotional eating to assist them with their weight loss maintenance. Weight loss maintenance has been targeted because previous research shows that most people know how to and can lose weight, however most people re-gain that weight. If people can be helped to maintain weight loss this could contribute to the fight against obesity, the leading cause of premature death and illness in Australia.

Instead of focusing on food like other interventions, the ACTing on Weight research has been designed to investigate the extent to which Acceptance and Commitment Therapy (ACT), a psychological intervention, may help people to overcome emotional eating to assist them with their weight loss maintenance.

ACT is a psychological intervention, and a branch of behavioural therapy, which helps people deal with unpleasant thoughts and emotions without looking for ways to escape or suppress them, which in this context is through eating.

Chief Investigator Dr. Cate Bearsley Smith said that "many people engage in emotional eating because in the short term it seems to help them avoid difficult emotions states such as anxiety, boredom, loneliness, anger and depression. Where people turn to eating to regulate their emotional state they are inevitably going to sabotage their weight loss efforts".

The ACTing on Weight approach works by teaching people psychological skills that will help them to better handle difficult thoughts and feelings that may be contributing to their emotional eating and weight loss maintenance struggle. That means that people may be less likely to use food as a coping mechanism.

Dr. Cate Bearsley-Smith said that "by attending the workshop as part of the ACTing on Weight research it is hoped that people will learn to feel their feelings and notice their thoughts without using food to avoid them, and in turn become more successful in their weight loss efforts".

ACT and weight has been trialled internationally but the Monash University research is the first time it has been tested in Australia in the context of weight loss maintenance and emotional eating.

To arrange an interview or participate in the research contact trial co-ordinator Emma Gallagher on

For more information see www.actingonweight.com.

Appendix F: The Preventative Health Journal 2011

The screenshot displays the homepage of the Preventative Health Journal website. The browser's address bar shows the URL http://www.preventativehealthjournal.com/news/article/acting_on_weight/. The website's header includes the logo "THE Preventative Health Journal" with the tagline "LEAD A HEALTHIER LIFESTYLE". Navigation links include Home, Forums, Wiki, News, Features, Directory, Videos, Business, Blogs, Subscribe, About, Advertising, and Contact. A search bar is located on the right side of the header.

The main article, "ACTing on Weight", is dated 18 Feb, 2011. The article text reads:

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Article details:

- Categories: [Eating Disorders](#)
- Comments: 2
- Bookmark & share this article: [Tell-a-Friend](#)

On the right side of the page, there is a "Directory selection" section with the following entries:

- Release Technique (NSW)**: Finally: Free your mind of money worries and day-to-day concerns to find your place of peace in the world. If you ...
- The BodyTalk System (NSW)**: As many of us now, stress is the number one cause of disease in the world because it causes the ...
- Lifestyle Practitioner Academy (QLD)**: Specialising in training health practitioners (e.g. natural health therapists) how to maximise their income and earn what they are really ...
- Progut (NSW)**: After 21 years of research and development into the benefits of a unique probiotic formulation, Progut was released to balance ...
- The Alistair Horscroft Mind Institute (QLD)**: Book now for the Mind Institute's latest courses. The Alistair Horscroft Mind Institute is offering tickets for a 11 day ...

The bottom of the screenshot shows a Windows taskbar with several open applications: "List of Figures Table...", "Media Release 2010 ...", "Method ACTing on ...", "Appendix E Press R...", and "ACTing on Weight | ...".

Appendix G:
Waverley Leader Newspaper Article

2 | Waverley Leader April 13, 2010



Emma Gallagher is co-ordinating an Australian-first study of a new technique to help people overcome emotional eating.

Picture: MARK STEWART N41WG130

Emotion taking you over

Health | Michelle Carnovale

WE'VE all done it – reached for that chocolate bar, ice-cream tub or fried food to comfort us in times of emotion.

Most people who put on weight through emotional eating know how to lose it, but the problem is keeping the weight loss off and not falling back into the vicious cycle of comfort eating.

Monash University researcher and psychologist Emma Gallagher is co-ordinating a study to help those who have trouble keeping off the kilograms.

Ms Gallagher, who is completing her doctorate in psychology, said she was looking for residents, particularly those around the City of Monash, who had recently lost weight but had trouble maintaining it.

"It's about connecting with your thinking

and acting on your thinking," Ms Gallagher said.

"Research is pretty clear that people do have difficulty doing this even though they know how to lose weight."

Ms Gallagher said she would be "tapping into that emotional eating" with her participants to determine why they turned to food.

"It is hoped this research will show that when people can learn to feel their emotions without using food to avoid them, they will be more successful in maintaining weight loss maintenance," she said.

Participants will attend a seminar to learn how to better handle their thought processes and how to influence their personal responses to "unhelpful" behaviour.

► **Email actingonweight@yahoo.com.au to sign up for the trial or for more information.**

Appendix H:
The Age Newspaper Advertisement

The advertisement is a rectangular layout. On the left, there is a blue vertical band with the text "Have you recently lost weight?" in white, bold, sans-serif font. To the right of this band, the text is in black. It starts with "The ACTing on Weight team from Monash University is recruiting adults who have recently lost weight to participate in research about weight loss maintenance and emotional eating." followed by "Contact Emma on 0468 548 518 or actingtonweight@yahoo.com.au" and the website "www.actingtonweight.com". Below this is the text "CRICOS Provider: Monash University 00008C". At the bottom right is the Monash University logo, which consists of a blue shield with a white cross and the text "MONASH University" in a bold, sans-serif font.

Have you recently lost weight?

The ACTing on Weight team from Monash University is recruiting adults who have recently lost weight to participate in research about weight loss maintenance and emotional eating.

Contact Emma on 0468 548 518 or actingtonweight@yahoo.com.au

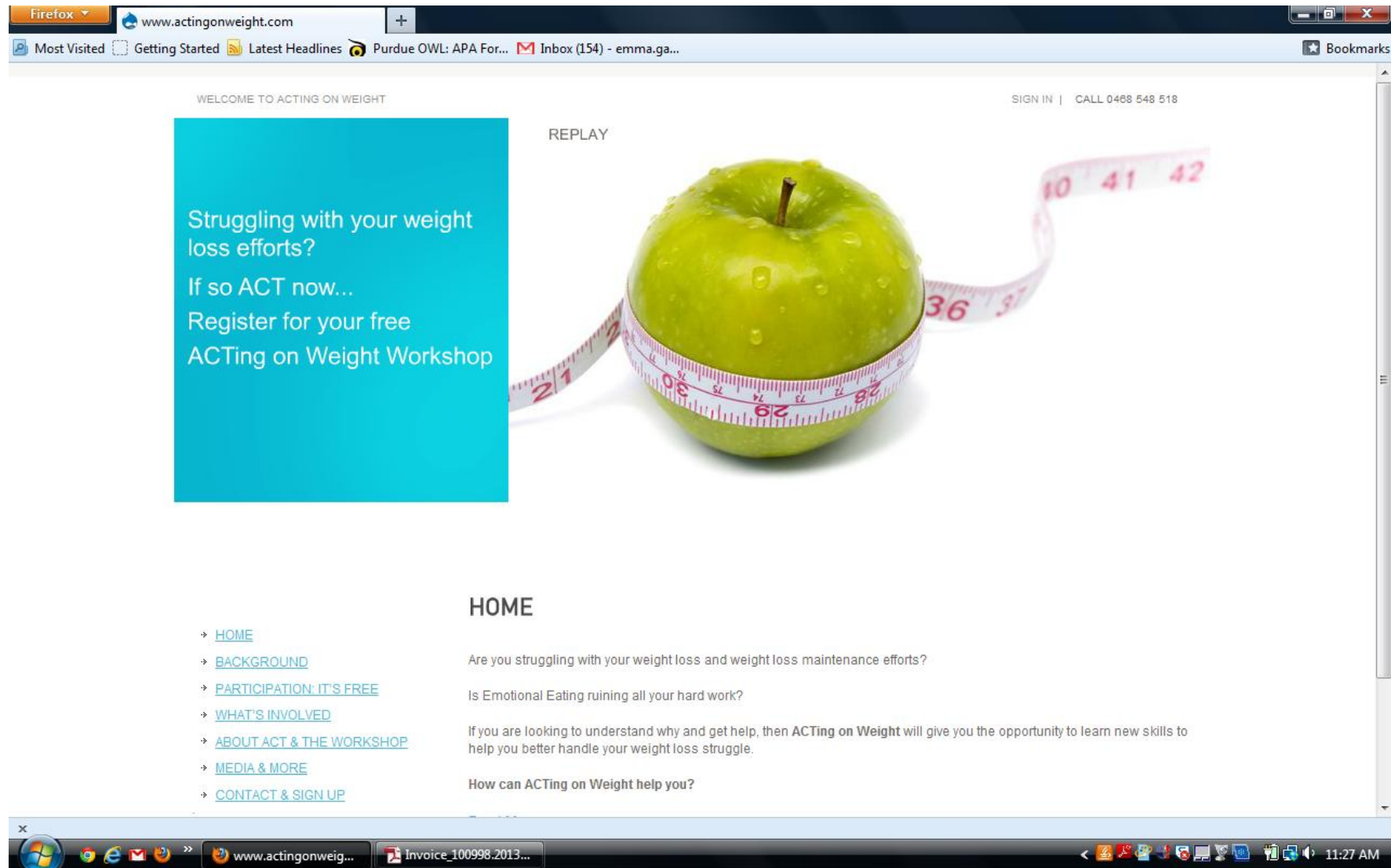
www.actingtonweight.com

CRICOS Provider: Monash University 00008C

 **MONASH University**

CRS6077_1.indd 1 17/03/11 2:47 PM


Appendix I: ACTing on Weight Website



Firefox | BACKGROUND | www.actingtonweight.c... | +

Most Visited | Getting Started | Latest Headlines | Purdue OWL: APA For... | Inbox (154) - emma.ga... | Bookmarks

Struggling with your weight loss efforts?
If so ACT now...
Register for your free
ACTing on Weight Workshop



BACKGROUND

- [HOME](#)
- [BACKGROUND](#)
- [PARTICIPATION: IT'S FREE](#)
- [WHAT'S INVOLVED](#)
- [ABOUT ACT & THE WORKSHOP](#)
- [MEDIA & MORE](#)
- [CONTACT & SIGN UP](#)

My name is Emma Gallagher and together with Dr. Cate Bearsley-Smith and Dr. Sabura Allen we are researching the possibility that Acceptance and Commitment Therapy (ACT) may help people maintain weight loss through targeting Emotional Eating. We are all from the School of Psychology and Psychiatry at Monash University. I am conducting ACTing on Weight as research as part of my Doctorate of Psychology (Clinical) degree.

Previous research shows that most people are able to lose weight, however it seems to be very difficult for people to maintain their weight loss. There is also some research showing that emotional eating seems to impact people's ability to maintain their weight loss. The ACTing on Weight research involves evaluating an ACT workshop for weight loss maintenance and involves measuring associated factors including emotional eating.

Using ACT for Weight is gaining momentum within the empirical research arena and within popular literature. For example, ACTing on Weight was recently mentioned in the Women's Health Magazine. Click [here](#) to view.

ACT has also been shown to be helpful in other health related areas, for example smoking. Click [here](#) to view.

Windows Taskbar: BACKGROUND | ww..., Invoice_100998.2013..., ACTing on Weight ... | 11:28 AM

Firefox PARTICIPATION: IT'S FREE | www.acting... +

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PARTICIPATION: IT'S FREE

- [HOME](#)
- [BACKGROUND](#)
- [PARTICIPATION: IT'S FREE](#)
- [WHAT'S INVOLVED](#)
- [ABOUT ACT & THE WORKSHOP](#)
- [MEDIA & MORE](#)
- [CONTACT & SIGN UP](#)

Recruitment has now closed. Thank you for your interest.

You may be eligible to participate in **ACTing on Weight Workshops** if you are over 18 years-old and have recently lost weight.

After you initiate contact with your workshop facilitator, Emma Gallagher, you will have a telephone conversation with Emma who will ask you a few brief questions to see if you meet the eligibility criteria to participate in the research.

If eligible you will be sent a formal 'Explanatory Statement' outlining about what's involved in participating in the research. Contact Emma to inquire about your eligibility.

[REDACTED]

Or Sign Up and I will contact you.
Click [here](#) to sign up.

Costs and Rewards

Cost: Participation in the Workshop is FREE because we are running it as part of a research project through Monash University.

Compensation:
To provide some compensation for travel expenses involved in participating in workshops, \$20 will be reimbursed to each participant at the second workshop.

\$50 Prize:
All participants will also go into a draw for a \$50 David Jones voucher after all workshops are completed.

Voluntary participation - Can I withdraw from the research?

Being in this study is voluntary and you are under no obligation to consent to participation. You may withdraw from the research at anytime.

Windows Taskbar: PARTICIPATION: IT' ... Invoice_100998.2013... ACTing on Weight ... 11:33 AM

Firefox | WHAT'S INVOLVED | www.actingtonweig... | +

Most Visited | Getting Started | Latest Headlines | Purdue OWL: APA For... | Inbox (154) - emma.ga... | Bookmarks

WHAT'S INVOLVED


- [HOME](#)
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- [WHAT'S INVOLVED](#)
- [ABOUT ACT & THE WORKSHOP](#)
- [MEDIA & MORE](#)
- [CONTACT & SIGN UP](#)

Once you have had your initial telephone conversation and Emma has established you meet the criteria to participate, your involvement will consist of the following:

1. The first step is to officially register at a face-to-face meeting. Here your details are officially recorded. You will have your height and weight measured by a registered nurse, and you may be asked to complete a survey questionnaire. At this meeting you will also be randomly allocated to your **ACTing on Weight** workshop dates. Registration takes about 1 hour.
2. The second step is to attend your first of two **ACTing on Weight** workshops. This workshop runs from 9am-4.30pm, on a Saturday. As part of the day you will be asked to fill in a survey questionnaire and will have your height and weight measured by a registered nurse. This is where you will be taught new skills to help manage your emotional eating and weight loss maintenance struggle.
3. The third step is to attend the second and shorter **ACTing on Weight** follow-up workshop. This workshop runs from 9am-11.30am. Again, you will be asked to fill in a survey questionnaire and will have your height and weight measured by a registered nurse.

Location: The registration session and workshops are held in the south-east of Melbourne.

Please contact Emma if you would like to ask further details about What's Involved in attending the **ACTing on Weight** workshops.



Or Sign Up and I will contact you.
Click [here](#) to sign up.

Note: Random Allocation: Random allocation to workshop dates is necessary because the workshops are being conducted as part of a research project. Random allocation is designed to limit any bias around who attends each group and assists in ensuring a range of people attend each group.

Windows Taskbar: WHAT'S INVOLVED | Invoice_100998.2013... | ACTing on Weight ... | 11:33 AM

Firefox CONTACT & SIGN UP | www.actingonw... +

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- [WHAT'S INVOLVED](#)
- [ABOUT ACT & THE WORKSHOP](#)
- [MEDIA & MORE](#)
- [CONTACT & SIGN UP](#)

Recruitment has now closed. Thank you for your interest.

Contact Emma Gallagher for details about ACTing on Weight.

[REDACTED]

Or fill in the Sign Up form and I will contact you.
Visit me on [Facebook](#).

Compensation
On attendance at the second workshop participants will receive a small financial contribution toward travel expenses incurred by attendance at the workshops; \$20.

\$50 Prize
All participants will go into a draw for a \$50 David Jones voucher.

Confidentiality
All information collected is securely stored and de-identified (names are removed), so that all participants information remains anonymous and confidential. The results will be reported as aggregate research findings (or group data) so it will not be possible for individual participation to be identified.

Ethics Approval
ACTing on Weight ethics approval has been granted by Monash University Human Research Ethics Committee no. CF09/2473 – 2009001435. If you have a complaint concerning the manner in which this research no. CF09/2473 – 2009001435 is being conducted, please contact: Executive Officer, Human Research Ethics, Monash University Human Research Ethics Committee (MUHREC), Building 3e Room 111, Research Office, Monash University VIC.3800. [REDACTED]

Sign Up Form: Recruitment has now closed. Thank you for your interest.

Full Name:

Post Code:

Email:

Phone:

CONTACT & SIGN UP Invoice_100998.2013... ACTing on Weight ...

11:34 AM

Firefox

ABOUT ACT & THE WORKSHOP | www...

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ABOUT ACT & THE WORKSHOP

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- [ABOUT ACT & THE WORKSHOP](#)
- [MEDIA & MORE](#)
- [CONTACT & SIGN UP](#)

ACTing on Weight is a Monash University research project exploring the helpfulness of *Acceptance and Commitment Therapy* (ACT), a psychological intervention, for weight loss maintenance and emotional eating. That means there are no pills, shakes or diet plans. Instead, it's about you learning new ways to ACT in the face of your individual thoughts and feelings linked to your eating and weight.

Acceptance and Commitment Therapy is a psychological intervention designed to increase people's psychological flexibility so that they are more able to handle the difficult thoughts and feelings that human's inevitably experience during their life. The aim of ACT is to assist people to overcome the natural human tendency to get caught up in, struggle with, and be limited by, thoughts and feelings which cause psychological pain. ACT does this by teaching people psychological skills that enable them to change their relationship with their thoughts and feelings and accommodate them, as opposed to explicitly changing or avoiding them.

How the ACTing on Weight workshops will help you

The aim of the **ACTing on Weight** is to teach you new psychological skills that will help you to better handle difficult thoughts and feelings that may be contributing to your emotional eating and weight loss maintenance struggle. The research hypothesis is that if ACT can help people handle unwanted or unbearable feelings and thoughts better they are then less likely to turn to eating as a way of coping and as a result stop sabotaging their weight loss maintenance efforts.

Feedback from Workshop Participants

Some comments from participants:

- "It gives you real tangible skills"
- "Excellent, good tools"
- "Useful and insightful"
- "Important to my life"
- "Valuable, more aware"

Participation at the workshops is **Free**. A similar workshop has recently been advertised at the value of \$245.

Windows taskbar: x, Start button, icons for Chrome, Firefox, Mail, and others, open windows: ABOUT ACT & THE ..., Invoice_100998.2013..., ACTing on Weight ..., system tray: 11:35 AM

Firefox | MEDIA & MORE | www.actingonweight... | +

Most Visited | Getting Started | Latest Headlines | Purdue OWL: APA For... | Inbox (154) - emma.ga... | Bookmarks

MEDIA & MORE

- [HOME](#)
- [BACKGROUND](#)
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- [ABOUT ACT & THE WORKSHOP](#)
- [MEDIA & MORE](#)
- [CONTACT & SIGN UP](#)

Using ACT for Weight is gaining momentum both within the empirical research arena as well as the popular media.

Popular Media

Women's Health Magazine: references ACTing on Weight. Click [here](#) to see article (web version). Click [here](#) for PDF (2.80mb).
 Leader Newspaper: feature article on ACTing on Weight. Click [here](#) to see article (PDF 1mb).
 Monash Media Release: for ACTing on Weight. Click [here](#) to go to web site.
 Vogue: ACT and consumption. Click [here](#) to see article (PDF 3.6mb).

Empirical Research

Weight Related

Teaching Acceptance and Mindfulness to Improve the Lives of the Obese: A Preliminary Test of a Theoretical Model.

By: Jason Lillis, Ph.D. & Steven C. Hayes, Ph.D. & Kara Bunting, M.A. & Akihiko Masuda, Ph.D. Where: The Society of Behavioral Medicine 37:58–69.
 When: 2009.

This study found that after three months people who attended the ACT based workshop were more likely to have experienced improvements in Body Mass Index (BMI) as well as improvements in quality of life, psychological distress, and distress tolerance. It was concluded that Acceptance and Commitment Therapy principles were contributing to improvements in quality of life and weight management.

Method: 84 people were randomly assigned to attend a 1-day workshop. Mediation analysis was used to analysis the data.

Exploratory randomised controlled trial of a mindfulness-based weight loss intervention for women

By: Katy Tapper, Christine Shaw, Joanne Ilsley, Andrew J. Hill, Frank W. Bond, & Laurence Moore.
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 When: 2009.

This study found that after six months people who applied knowledge learnt at the ACT consistent workshops were significantly more likely to have greater reductions in their Body Mass Index (BMI) and also show significantly greater increases in physical activity. It was concluded that the intervention was successful at bringing about change.

Method: 64 people were randomly assigned to attend ACT consistent workshops. Mediation and moderation analysis was used to analysis the data.

Windows Taskbar: MEDIA & MORE | w... | Invoice_100998.2013... | ACTing on Weight ... | 11:35 AM

Text Content of the ACTing on Weight Website

HOME Page

Are you struggling with your weight loss and weight loss maintenance efforts?

Is Emotional Eating ruining all your hard work?

If you are looking to understand why and get help, then **ACTing on Weight** will give you the opportunity to learn new skills to help you better handle your weight loss struggle.

How can ACTing on Weight help you?

ACTing on Weight teaches you new psychological skills that will help you to better handle difficult thoughts and feelings that may be contributing to your emotional eating and weight loss maintenance struggle.

This means that by participating in **ACTing on Weight** you may be less likely to turn to eating as a way of coping and as a result stop sabotaging your weight loss maintenance efforts!

ACTing on Weight workshops are being offered as part of a research project at Monash University, and that means it's FREE to attend.

Contact Details:

Emma Gallagher

[REDACTED]

[REDACTED]

Or [Sign Up](#) and I will contact you.

BACKGROUND page

My name is Emma Gallagher and together with Dr. Cate Bearsley-Smith and Dr. Sabura Allen we are researching the possibility that Acceptance and Commitment Therapy (ACT) may help people maintain weight loss through targeting Emotional Eating. We are all from the School of Psychology and Psychiatry at Monash University. I am conducting ACTing on Weight as research as part of my Doctorate of Psychology (Clinical) degree.

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Click [here](#) to view.

ACT has also been shown to be helpful in other health related areas, for example smoking.

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[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

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"Valuable, more aware"

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When: 2009.

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Method: 64 people were randomly assigned to attend ACT consistent workshops. Mediation and moderation analysis was used to analysis the data.

Smoking Related, for interests sake...

Acceptance-Based Treatment for Smoking Cessation

By: Elizabeth V. Gifford, Barbara S. Kohlenberg, Steven C. Hayes,

David O. Antonuccio, Melissa M. Piasecki, Mandra L. Rasmussen-Hall, Kathleen M. Palm.

Where: *BEHAVIOR THERAPY* 35, 689–705.

When: 2004

Abstract:

This pilot study applied a theoretically derived model of acceptance-based treatment process to smoking cessation, and compared it to a pharmacological treatment based on a medical dependence model. Seventy-six nicotine-dependent smokers were randomly assigned to one of two treatments: Nicotine Replacement Treatment (NRT), or a smoking-focused version of Acceptance and Commitment Therapy (ACT). There were no differences between conditions at posttreatment; however, participants in the ACT condition had better long-term smoking outcomes at 1-year follow-up.

As predicted by the acceptance process model, ACT outcomes at 1 year were mediated by improvements in acceptance-related skills. Withdrawal symptoms and negative affect neither differed

between conditions nor predicted outcomes. Results were consistent with the functional acceptance-based treatment model.

Similar programs available in Australia

The 'Weight Escape', an ACT based program for weight loss provided by Russ Harris one of Australia's best known ACT practitioners and trainers. Click [here](#) to go to web site.

CONTACT & SIGN UP

Recruitment has now closed. Thank you for your interest.

Contact Emma Gallagher for details about ACTing on Weight.

[REDACTED]

[REDACTED]

Or fill in the Sign Up form and I will contact you.

Visit me on [Facebook](#).

Compensation

On attendance at the second workshop participants will receive a small financial contribution toward travel expenses incurred by attendance at the workshops; \$20.

\$50 Prize

All participants will go into a draw for a \$50 David Jones voucher.

Confidentiality

All information collected is securely stored and de-identified (names are removed), so that all participants information remains anonymous and confidential. The results will be reported as aggregate research findings (or group data) so it will not be possible for individual participation to be identified.

Ethics Approval

ACTing on Weight ethics approval has been granted by Monash University Human Research Ethics Committee no. CF09/2473 – 2009001435. If you have a complaint concerning the manner in which this research no. CF09/2473 – 2009001435 is being conducted, please contact: Executive Officer, Human Research Ethics, Monash University Human Research Ethics Committee (MUHREC), Building 3e Room 111, Research Office, Monash University VIC.3800. [REDACTED]

[REDACTED].

Sign Up Form:

Full Name:

Post Code:

Email:

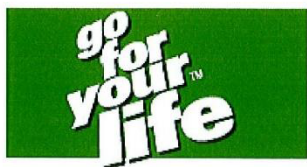
Phone Number:

**Where did you hear about
ACTing on Weight?:**

Message:

Appendix J: Go for your Life Advertisement

ACTing on Weight

http://www.goforyourlife.vic.gov.au/hav/events.nsf/pages/ACTing_...

Search site

Search

Everyone

Teenagers

Adults

New parents

Children
and
families

Older adults

[Home](#) > [Active Living](#) > [Places to go/Things to do](#) > [ACTing on Weight](#)

ACTing on Weight

[Healthy Eating](#)[Active Living](#)[Tip Sheets](#)[In your language](#)**Event:** [ACTing on Weight](#)**Organisation:** Monash University

Description: The ACTing on Weight team from Monash University is currently recruiting adults who have recently lost weight to participate in research about weight loss maintenance and emotional eating. There are no diets, pills or shakes. Instead a FREE workshop is provided that aims to teach people new psychological skills designed to help them better handle difficult thoughts and feelings that may be contributing to their emotional eating and weight loss maintenance struggle.

**Date:** 5th Mar 2011

Contact Details

Email: [REDACTED]
 Contact 0468 548 518
 Telephone:



Last updated: 02/17/2011

'Go for your life' Infoline - 1300 73 98 99

[Site map](#) | [Contact us](#) | [About us](#) | [Subscribe](#) | [Help](#) | [Copyright](#) | [Disclaimer](#) | [Privacy](#)

Appendix K: Ethics Approval MUREC



Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

Date: 28 October 2009

Project Number: CF09/2473 – 2009001435

Project Title: ACTing on weight maintenance

Chief Investigator: Dr Cate Bearsley-Smith

Approved: From: 28 October 2009 To: 28 October 2014

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: Prof Paul Martin; Ms Emma Gallagher

Postal – Monash University, Vic 3800, Australia
Building 3E, Room 111, Clayton Campus, Wellington Road, Clayton

www.monash.edu/research/ethics/human/index/html
ABN 12 577 614 012 CRICOS Provider #00008C

Appendix L:
Participant Information Pack

MONASH University



February 2011

You are invited to participate in a research project:

ACTing on Weight
Explanatory Statement

This information sheet is for you to keep.

My name is Emma Gallagher and as part of a Doctorate of Psychology (Clinical) degree my supervisors, Dr. Cate Bearsley-Smith and Dr. Sabura Allen, and I are conducting research exploring the possibility that Acceptance and Commitment Therapy (ACT) may help people maintain weight loss. We are all from the School of Psychology and Psychiatry at Monash University.

About the research project

Research shows that most people are able to lose weight, however it seems to be very difficult for people to maintain their weight loss. There is also some research showing that emotional eating seems to impact people's ability to maintain their weight loss. My research involves evaluating an ACT workshop for weight maintenance and involves measuring associated factors including emotional eating. The ACT workshop aims to teach people how to maintain a healthy weight.

Invitation to participate

I am inviting people who have recently lost weight to participate in this research. Participants attend a 30 minute to 1hr registration session and may complete a survey questionnaire, and have a registered nurse measure their waistline and their height and weight for Body Mass Index (BMI) calculations. After registration two workshop dates will be allocated to each person. The first workshop is 6-hours long, the second workshop is 2-hours long, plus completing another survey questionnaire and another measurement of weight. Participation eligibility criteria are: over 18 y/o, recent weight loss of at least 5% of initial body weight, current weight within or above normal weight range according to the Body Mass Index, currently not pregnant or lactating, or have recently given birth.

Inconvenience/discomfort

Participants are required to attend the registration, the 6-hour workshop, and a follow-up 2-hour workshop. No further inconvenience is foreseen. It is not expected that participants will experience distress above their normal distress levels, and there is no risk of physical or psychological harm in this research. However, it is possible that participants may experience their unpleasant emotions in a different way than they are accustomed to. If as a result of participation any concerns are raised appropriate services will be arranged. If you have any concerns or questions regarding the research feel free to contact Dr Cate Bearsley-Smith, Clinical Psychologist (contact details below). In addition, attached is a Services and Resources List, including free counselling services, you may wish to access which are independent to this research.

Confidentiality

All information collected is securely stored and de-identified (names are removed), so that all participants information remains anonymous and confidential. The results will be reported as aggregate research findings (or group data) so it will not be possible for individual participation to be identified.

Voluntary participation - Can I withdraw from the research?

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Being in this study is voluntary and you are under no obligation to consent to participation. If you do consent to participate, you may withdraw from the study at anytime.

Payment

To provide some compensation for travel expenses involved in participating in workshops, \$20 will be reimbursed to each participant at the second workshop. All participants will also go into a draw for a \$50 David Jones voucher after all workshops are completed.

Storage of survey questionnaire information/data

Storage of the data collected will adhere to the University regulations and will be kept on University premises in a locked cupboard/filing cabinet for 5 years, after which the records will be confidentially destroyed. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Use of data for subsequent research purposes

Due to the potential significance of the results this research may provide for the practice of ACT, it is possible that the de-identified, anonymous, data may be used for the purposes of subsequent research. Because the data will be made anonymous, nobody will be named or identifiable in any way.

Ethical guidelines

This research will be carried out according to the National Statement on Ethical Conduct in Research Involving Humans (1999), produced by the National Health and Medical Research Council of Australia. This research has been approved by the Monash University Human Research Ethics Committee, Clayton.

Results

As well as the results of this research being reported as part of my thesis, it is also possible that the results will be published in a research journal and/or shared with other researchers. All results will be reported as aggregate, or group, results so that no individual participant can be individually identified. If you would like to be informed of the aggregate research findings, please contact Ms Emma Gallagher [REDACTED]. The findings will be accessible indefinitely.

Participants will have the option of being informed of individual BMI results, however all other results will only be reported as aggregate results.

If you would like to contact the researchers about any aspect of this study, please contact the Chief Investigator:	If you have a complaint concerning the manner in which this research CF09/2473-2009001435 is being conducted, please contact:
Dr. Cate Bearsley-Smith, Senior Lecturer School of Psychology and Psychiatry Monash University PO Box 424 Traralgon 3844 [REDACTED]	Executive Officer, Human Research Ethics Monash University Human Research Ethics Committee (MUHREC) Building 3e Room 111 Research Office, Monash University VIC 3800 [REDACTED] [REDACTED] [REDACTED]

Thank you. **Emma Gallagher**
Doctor of Psychology (Clinical) Candidate
Provisional Psychologist
[REDACTED]

www.actinonweight.com.au



Services and Resources List

Lifeline

Provides free telephone counselling, and also facilitates referrals to more tailored services.

www.lifeline.org.au

Helpline: [REDACTED]

beyondblue

Facilitates referrals for mental health concerns specialising in depression and anxiety.

www.beyondblue.org.au

Helpline: [REDACTED]

Australian Psychological Society

Facilitates referrals to psychologists for a broad range of mental health concerns.

www.psychology.org.au

[REDACTED]

[REDACTED]

[REDACTED]

Better Health Channel

Provides links to health related resources, see the Better Health Channel Service Directory.

www.betterhealth.vic.gov.au

Eating Disorders Foundation of Victoria Inc (EDV)

Provides support, information, education and advocacy.

www.eatingdisorders.org.au

Helpline: [REDACTED]

[REDACTED]

Diabetes Australia, Victoria

Provides support, information, education and advocacy.

www.diabetesvic.org.au

Helpline: [REDACTED]

It is recommended that if you are concerned about your physical or mental health that you consult your General Practitioner or one of the above services.

ACTing on Weight

Possible Workshop Dates

At the registration session you will be allocated to any one
of the workshop groups below:

Possibility 1

Initial Workshop: **26th March 2011** & Follow-up Workshop: **18th June 2011**

Or

Possibility 2

Initial Workshop: **4th June 2011** & Follow-up Workshop: **27th August 2011**

Appendix M:
Participant Consent Form

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Participant Consent Form

Title: ACTing on Weight Maintenance

NOTE: This consent form will remain with the Monash University researcher for their records

I agree to take part in the Monash University research project specified above. I have had the project explained to me, and I have read the Explanatory Statement, which I keep for my records. I understand that agreeing to take part means that:

1. a) I agree to complete questionnaires asking me about: my weight loss maintenance; my behaviours, thoughts, and feelings in general and specifically related to emotional eating; my general well-being; my general health, dietary intake and activity levels; and broad demographic questions including questions about my age, education, gender, and relationship status.
- b) I agree to have my height and weight measured for calculations of Body Mass Index (BMI), and my waist circumference measured.
- c) I agree to participate in two workshops that are based on Acceptance and Commitment Therapy for weight maintenance.
2. I understand that my participation is voluntary, that I can choose not to participate in the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.
3. I understand that any data that the researcher extracts from the questionnaire/survey for use in reports or published findings will not, under any circumstances, contain names or identifying characteristics.
4. I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party.
5. I understand that data from the questionnaire/survey and body measurements will be kept in a secure storage and accessible to the research team. I also understand that the data will be destroyed after a 5 year period unless I consent to it being used in future research.
6. I have indicated below that I agree, or do not agree, that the information I provide for this research project can be used in another research project *after my information has been de-identified and has thus become anonymous*.

Please tick one below.

☐ Yes, I agree

☐ No, I do not agree

Participant's name: _____

Signature: _____

Date: _____

Appendix N:
Nurse's Form

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ACTing on Weight Maintenance

Nurse Form 1

Participant ID: _____

Check ID on: Consent form is the same as ID card YES NO

Consent Form Signed: _____ YES NO

Participants self-report: Weight _____ Height _____

Technical Measurements:

Height: _____

Weight: _____

BMI = kg/m²

e.g. $70 / 1.63 \times 1.63 = 26 \dots\dots\dots$

BMI at healthy or above range **>18.5**: YES NO If NO: STOP

Waistline: _____

Random Allocation Code: _____ Colour Code: **Blue** **Purple**

Transcribe **Colour & Random Allocation Codes** onto the back of ID card.

Put Consent form in randomisation envelope with colour paper and seal.

Appendix O:
ACTing on Weight Self Report Questionnaire

MONASH University



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ACTing-on-Weight-Maintenance-¶

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Questionnaire-a¶

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¶	ID-code:_____¶
¶	~

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Questionnaire

Instructions:

(EES)

We all respond to different emotions in different ways. Some types of feelings lead people to experience an urge to eat. Please indicate the extent to which the following feelings lead you to feel an urge to eat by ticking the appropriate box.

	No Desire to Eat	A Small Desire to Eat	A Moderate Desire to Eat	A Strong Urge to Eat	An Overwhelming Urge to Eat
Resentful					
Discouraged					
Shaky					
Worn Out					
Inadequate					
Excited					
Rebellious					
Blue					
Jittery					
Sad					
Uneasy					
Irritated					
Jealous					
Worried					
Frustrated					
Lonely					
Furious					
On Edge					
Confused					
Nervous					
Angry					
Guilty					
Bored					
Helpless					
Upset					

Instructions:						(AAQ-2)
<p><i>Below you will find a list of statements.</i></p> <p><i>Please rate how true each statement is for you by circling a number next to it.</i></p> <p><i>Use the scale below to make your choice.</i></p>						
1	2	3	4	5	6	7
Never true	Very seldom true	Seldom true	Sometimes true	Frequently true	Almost always true	Always true

1. Its OK if I remember something unpleasant.	1	2	3	4	5	6	7
2. My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
3. I'm afraid of my feelings.	1	2	3	4	5	6	7
4. I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
5. My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
6. I am in control of my life.	1	2	3	4	5	6	7
7. Emotions cause problems in my life.	1	2	3	4	5	6	7
8. It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
9. Worries get in the way of my success.	1	2	3	4	5	6	7
10. My thoughts and feelings do not get in the way of how I want to live my life.	1	2	3	4	5	6	7

Instructions:	(EADES)
<p><i>Please determine your level of agreement with the following statements. There are no right or wrong answers. Treat each question separately and answer as honestly as possible.</i></p>	

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. I am confident I can control my eating when I feel happy.	1	2	3	4	5
2. I overeat when I am stressed.	1	2	3	4	5
3. I overeat when I socialise.	1	2	3	4	5
4. I comfort myself with food.	1	2	3	4	5
5. I eat when I am upset with myself.	1	2	3	4	5
6. I am confident I can control my eating when I am tired.	1	2	3	4	5

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
7. I am confident I can control my eating when I am angry.	1	2	3	4	5
8. It is hard for me to stop eating when I am full.	1	2	3	4	5
9. I am confident I can control my eating when I am sad.	1	2	3	4	5
10. I eat to avoid dealing with problems.	1	2	3	4	5
11. I am confident I can control my eating when I am upset with myself.	1	2	3	4	5
12. I am confident I can control my eating when I feel upset.	1	2	3	4	5
13. I feel out of control when I eat.	1	2	3	4	5
14. I eat when I am frustrated.	1	2	3	4	5
15. I am confident I can control my eating when I am frustrated.	1	2	3	4	5
16. I use food to cope with my emotions.	1	2	3	4	5
17. I eat when I am tired.	1	2	3	4	5
18. I eat when I am angry.	1	2	3	4	5
19. I eat when I am sad.	1	2	3	4	5
20. I am confident I can control my eating when I am anxious.	1	2	3	4	5
21. I am confident I can control my eating when I am relieved.	1	2	3	4	5
22. I eat when I am anxious.	1	2	3	4	5
23. I eat when I am relieved.	1	2	3	4	5
24. I do NOT have control over how much I eat.	1	2	3	4	5

Instructions:

(AAQ-W)

*Below you will find a list of statements.**Please rate the truth of each statement as it applies to you.**Use the following scale to make your choice.*

1	2	3	4	5	6	7
Never true	Very Seldom true	Seldom true	Sometimes true	Frequently true	Almost Always true	Always true

1. It's OK to feel fat.	1	2	3	4	5	6	7
2. When I have negative feelings, I use food to make myself feel better.	1	2	3	4	5	6	7

1	2	3	4	5	6	7
Never true	Very seldom true	Seldom true	Sometimes true	Frequently true	Almost always true	Always true

3. I try to suppress thoughts and feelings that I don't like about my body or weight by just not thinking them.	1	2	3	4	5	6	7
4. I am not in control of what I eat.	1	2	3	4	5	6	7
5. I try hard to avoid feeling bad about my weight or how I look.	1	2	3	4	5	6	7
6. I am in control of how much physical activity I do.	1	2	3	4	5	6	7
7. When I evaluate my weight or my appearance negatively, I am able to recognize that this is just a reaction, not an objective fact.	1	2	3	4	5	6	7
8. In order to eat well and do physical activity, I need to feel like it.	1	2	3	4	5	6	7
9. I need to feel better about how I look in order to live the life I want to.	1	2	3	4	5	6	7
10. Other people make it hard for me to accept myself.	1	2	3	4	5	6	7
11. If I'm overweight, I can't live the life I want to.	1	2	3	4	5	6	7
12. If I feel unattractive, there is no point in trying to be intimate.	1	2	3	4	5	6	7
13. If I gain weight, that means I have failed.	1	2	3	4	5	6	7
14. I'm in control of my eating behaviour.	1	2	3	4	5	6	7
15. I don't have what it takes to be healthy for life.	1	2	3	4	5	6	7
16. My eating urges control me.	1	2	3	4	5	6	7

Instructions:

(AAQ-W)

*Imagine that the following thoughts occurred to you right now.**How valid or believable would each be?**For each question, please circle a number from 1 through 7.*

1	2	3	4	5	6	7
<i>Not at all believable</i>						<i>Completely Believable</i>

17. I need to get rid of my eating urges to eat better.	1	2	3	4	5	6	7
18. I am a stable person.	1	2	3	4	5	6	7
19. If I eat something bad, the whole day is a waste.	1	2	3	4	5	6	7

1	2	3	4	5	6	7
<i>Not at all believable</i>						Completely Believable

20. I should be ashamed of my body.	1	2	3	4	5	6	7
21. I need to avoid social situations where people might judge me.	1	2	3	4	5	6	7
22. I will always be overweight.	1	2	3	4	5	6	7

Instructions:*(DEBQ)**Please answer each question by circling the number that best represents your response.*

	Never	Seldom	Sometimes	Often	Very Often	Not Relevant
1. Do you have the desire to eat when you are irritated?	1	2	3	4	5	6
2. Do you have a desire to eat when you have nothing to do?	1	2	3	4	5	6
3. Do you have a desire to eat when you are depressed or discouraged?	1	2	3	4	5	6
4. Do you have a desire to eat when you are feeling lonely?	1	2	3	4	5	6
5. Do you have a desire to eat when somebody lets you down?	1	2	3	4	5	6
6. Do you have a desire to eat when you are cross?	1	2	3	4	5	6
7. Do you have a desire to eat when you are expecting something unpleasant to happen?	1	2	3	4	5	-
8. Do you have the desire to eat when you are anxious, worried or tense?	1	2	3	4	5	-
9. Do you have a desire to eat when things are going against you or when things have gone wrong?	1	2	3	4	5	-

	Never	Seldom	Sometimes	Often	Very Often	Not Relevant
10. Do you have a desire to eat when you are frightened?	1	2	3	4	5	6
11. Do you have a desire to eat when you are disappointed?	1	2	3	4	5	6
12. Do you have a desire to eat when you are emotionally upset?	1	2	3	4	5	6
13. Do you have a desire to eat when you are bored or restless?	1	2	3	4	5	6

Instructions:

(SWLQ)

Below are five statements with which you may agree or disagree. Using the 1-7 scale, indicate your agreement with each item by circling the appropriate number. Please be open and honest in your responding.

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1. In most ways my life is close to my ideal.	1	2	3	4	5	6	7
2. The conditions of my life are excellent.	1	2	3	4	5	6	7
3. I am satisfied with life.	1	2	3	4	5	6	7
4. So far I have gotten the important things I want in life.	1	2	3	4	5	6	7
5. If I could live my life over, I would change almost nothing.	1	2	3	4	5	6	7

Instructions:

(PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the number of the appropriate answer next to the word. Indicate to what extent you generally feel this way, that is, how you feel on average.

Circle the number that best describes your present agreement or disagreement with each statement.	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested	1	2	3	4	5
Distressed	1	2	3	4	5
Excited	1	2	3	4	5
Upset	1	2	3	4	5
Strong	1	2	3	4	5
Guilty	1	2	3	4	5
Scared	1	2	3	4	5
Hostile	1	2	3	4	5

Circle the number that best describes your present agreement or disagreement with each statement.	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Irritable	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Inspired	1	2	3	4	5
Nervous	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Jittery	1	2	3	4	5
Active	1	2	3	4	5
Afraid	1	2	3	4	5

Instructions:

(GHQ)

We would like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer ALL questions by circling the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past. It is important that you try to answer ALL the questions.

Have you recently:				
1. Been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2. Lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3. Felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
4. Felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less capable
5. Felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6. Felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7. Been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8. Been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
9. Been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10. Been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11. Been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12. Been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual

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 **GL**
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the measure of potential

Limited The Chiswick Centre 414 Chiswick High Road, London W4 5TF, UK. This edition published 1992.
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Instructions:

(DI&AL)

Please answer the following questions about your behaviour over the last two weeks. Please circle your answer.

1. On average, how many days per week have you monitored your food intake?	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
2. On average, how many days per week have you monitored your food intake at every meal?	0	1	2	3	4	5	6	7
3. On average, how many days per week have you been satisfied with your weight maintenance strategies?	0	1	2	3	4	5	6	7

4. How many times a week do you usually do 20 minutes or more of vigorous-intensity physical activity that makes you sweat or puff and pant? (e.g., heavy lifting, digging, jogging, aerobics, or fast bicycling)?	3 or more times	1 or 2 times	none	
5. How many times a week do you usually do 30 minutes or more walking? (e.g., walking from place to place for exercise, leisure or recreation)?	5 or more times a week	3-4 times a week	1-2 times a week	none
6. How many times a week do you usually do 30 minutes or more of moderate-intensity physical activity that increases your heart rate or makes you breathe harder than normal? (e.g., carrying light loads, bicycling at a regular pace, or doubles tennis)?	5 or more times a week	3-4 times a week	1-2 times a week	none

Instructions:

(B)

Please answer the following questions about your past behaviour

1. Have you ever eaten, in a discrete period of time (e.g. within any 2 hour period), an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstances?

No, never

☐ (Go to next set of questions)

Yes, during the past three months

☐.....last time_____

Yes, before the past three months

☐.....last time_____

2. If yes to the above:

- a. Whilst you were eating did you experience a sense of lack of control over your eating at the time (e.g. feeling that you could not stop eating or control what or how much you were eating)?

Yes ☐No ☐

- b. Did you eat more rapidly than normal?

Yes ☐No ☐

- c. Did you eat until you felt uncomfortably full?

Yes ☐No ☐

- d. Did you eat large amounts of food when not feeling physically hungry?

Yes ☐No ☐

- e. Did you eat alone because of being embarrassed by how much you were eating?

Yes ☐No ☐

Instructions:						<i>(CF)</i>
Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.						
1	2	3	4	5	6	7
Never true	Very seldom true	Seldom true	Sometimes true	Frequently true	Almost always true	Always true

1. My thoughts cause me distress or emotional pain	1	2	3	4	5	6	7
2. I tell myself that I shouldn't be thinking the way I'm thinking	1	2	3	4	5	6	7
3. Even when I am having distressing thoughts, I know that they may become less important eventually	1	2	3	4	5	6	7
4. I find myself preoccupied with the future or the past	1	2	3	4	5	6	7
5. I make judgements about whether my thoughts are good or bad	1	2	3	4	5	6	7
6. Even when I'm having upsetting thoughts, I can see that those thoughts may not be literally true	1	2	3	4	5	6	7
7. I get upset with myself for having certain thoughts	1	2	3	4	5	6	7
8. I feel like my thoughts need to change before I can have a good life	1	2	3	4	5	6	7
9. I find it easy to view my thoughts from a different perspective	1	2	3	4	5	6	7
10. I tend to get very entangled in my thoughts	1	2	3	4	5	6	7
11. I think some of my thoughts are bad or inappropriate	1	2	3	4	5	6	7
12. I feel upset when I have negative thoughts about myself	1	2	3	4	5	6	7

1	2	3	4	5	6	7
Never true	Very Seldom true	Seldom true	Sometimes true	Frequently true	Almost Always true	Always true

13. I get very focussed on distressing thoughts	1	2	3	4	5	6	7
14. It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful	1	2	3	4	5	6	7
15. My thoughts distract me from what I'm actually doing	1	2	3	4	5	6	7
16. I get so caught up in my thoughts that I am unable to do the things that I most want to do	1	2	3	4	5	6	7
17. I over-analyse situations to the point where it's unhelpful to me	1	2	3	4	5	6	7
18. I can watch my thoughts from a distance without getting caught up in them	1	2	3	4	5	6	7
19. It is OK to have inconsistent thoughts on the same subject	1	2	3	4	5	6	7
20. Its possible for me to have negative thoughts about myself and still know that I am an OK person	1	2	3	4	5	6	7
21. I am able to do what's important in my life even when I have upsetting thoughts	1	2	3	4	5	6	7
22. I struggle with my thoughts	1	2	3	4	5	6	7
23. I can do difficult things even if my thoughts say they are impossible to do	1	2	3	4	5	6	7
24. I can be aware of my thoughts without necessarily reacting to them	1	2	3	4	5	6	7
25. Once I've thought about something upsetting its difficult for me to focus on anything else	1	2	3	4	5	6	7

1	2	3	4	5	6	7
Never true	Very Seldom true	Seldom true	Sometimes true	Frequently true	Almost Always true	Always true

26. I need to control the thoughts that come into my head	1	2	3	4	5	6	7
27. I tend to react very strongly to my thoughts	1	2	3	4	5	6	7
28. I get so caught up in my thoughts that I forget what I'm actually doing	1	2	3	4	5	6	7

Instructions:*(ORWELL)**Please answer the following questions by circling the answer that best represents your response.*

1a. How important is it for you to exercise regularly?	Not at all	Just a little	Not so Much	Much
1b. Is your weight an obstacle for your physical activity?	Not at all	Just a little	Not so Much	Much
2a. How important is it for you to have regular sexual activity?	Not at all	Just a little	Not so Much	Much
2b. Does your weight represent a physical obstacle for your sexual activity?	Not at all	Just a little	Not so Much	Much
3a. Do you suffer from shortness of breath?	Not at all	Just a little	Not so Much	Much
3b. Does shortness of breath represent an obstacle for your daily activities?	Not at all	Just a little	Not so Much	Much
4a. Do you ever feel sleepy	Never	Occasionally	Sometimes	Often
4b. Does sleepiness interfere with your daily activities?	Not at all	Just a little	Not so Much	Much
5a. Do you suffer from excessive sweating?	Not at all	Just a little	Not so Much	Much
5b. Does sweating interfere with your daily activities?	Not at all	Just a little	Not so Much	Much
6a. Mass media (TV, newspapers, etc.) often report that obesity is a major risk for health. Do you pay attention to this subject?	Not at all	Just a little	Not so Much	Much
6b. Does this information increase your preoccupation with your health?	Not at all	Just a little	Not so Much	Much
7a. Is it important for you to live in a serene family environment?	Not at all	Just a little	Not so Much	Much
7b. Does being overweight prompt discussions in your family?	Not at all	Just a little	Not so Much	Much

8a. Is it important for you to be successful in your job?	Not at all	Just a little	Not so Much	Much
8b. Does your weight represent an obstacle in your job?	Not at all	Just a little	Not so Much	Much
9a. Is it important to you to spend your free time with friends?	Not at all	Just a little	Not so Much	Much
9b. Does your weight interfere with your social activities?	Not at all	Just a little	Not so Much	Much
10a. Do you feel uneasy in showing your body?	Not at all	Just a little	Not so Much	Much
10b. Does this uneasiness interfere with your leisure activities?	Not at all	Just a little	Not so Much	Much
11a. Is it important to you to be sexually attractive?	Not at all	Just a little	Not so Much	Much
11b. Does being overweight make you less sexually attractive?	Not at all	Just a little	Not so Much	Much
12a. Do others ever tease you about your weight?	Never	Occasionally	Sometimes	Often
12b. If this happens, does it worsen your mood?	Not at all	Just a little	Not so Much	Much
13a. Do you feel excessively worried about unimportant matters?	Not at all	Just a little	Not so Much	Much
13b. Do you think that being overweight makes you more apprehensive?	Not at all	Just a little	Not so Much	Much
14a. Do you ever feel sad?	Not at all	Just a little	Not so Much	Much
14b. Do you ever feel sad because of being overweight?	Not at all	Just a little	Not so Much	Much
15a. Do you ever feel nervous?	Not at all	Just a little	Not so Much	Much
15b. Does being overweight make you more nervous?	Not at all	Just a little	Not so Much	Much
16a. Do you have a negative opinion of yourself?	Not at all	Just a little	Not so Much	Much
16b. Does being overweight interfere with your opinion of yourself?	Not at all	Just a little	Not so Much	Much
17a. Do you ever experience a feeling of immediate danger with no apparent reason?	Not at all	Just a little	Not so Much	Much
17.b Do you ever feel more exposed to risks because of being overweight?	Not at all	Just a little	Not so Much	Much
18a. The world of fashion and entertainment pursues a model of lean persons. How far do you feel from this model?	Not at all	Just a little	Not so Much	Much
18b. Would it be important for you to reach this model of thinness?	Not at all	Just a little	Not so Much	Much

ABOUT YOU

Please respond to the following questions:

☐ = respond by ticking

_____ = respond in writing

1. *Gender:* Female ☐ Male ☐
2. *Your age in years:* _____
3. *Your relationship status:*

Single <input type="checkbox"/>	Divorced <input type="checkbox"/>
Married <input type="checkbox"/>	Widowed <input type="checkbox"/>
Living with a partner/ Defacto <input type="checkbox"/>	Separated, living apart <input type="checkbox"/>
In a relationship, living separately <input type="checkbox"/>	Separated, living together <input type="checkbox"/>
4. *a. Do you have any dependent children?*
 NO ☐ YES ☐...If YES, how many? _____
b. Do you have any biological children?
 NO ☐ YES ☐...If YES, how many? _____
c. Have you recently, in the last six months, given birth?
 NO ☐ YES ☐
5. *Your highest level of education?*

<u>Completed</u>	<u>Currently attending</u>
Primary school <input type="checkbox"/>	None at all <input type="checkbox"/>
Secondary school <input type="checkbox"/>	Apprenticeship or TAFE <input type="checkbox"/>
Apprenticeship or TAFE <input type="checkbox"/>	University, undergraduate <input type="checkbox"/>
University, undergraduate <input type="checkbox"/>	University, post-graduate <input type="checkbox"/>
University, post-graduate <input type="checkbox"/>	
6. *Are you currently employed?*

Yes, Full-time <input type="checkbox"/>	No, unemployed <input type="checkbox"/>
Yes, Part-time <input type="checkbox"/>	No, homemaker <input type="checkbox"/>
Yes, Casual <input type="checkbox"/>	No, retired <input type="checkbox"/>
Yes, other <input type="checkbox"/> _____	No, other <input type="checkbox"/>
<input type="checkbox"/> _____	

6.a. Current profession: _____ Past profession: _____
7. *What is the gross annual income (including pensions and allowances) you personally receive from all sources?*

0-\$25,000 <input type="checkbox"/>	\$25,001-\$50,000 <input type="checkbox"/>	\$50,001-\$75,000 <input type="checkbox"/>
\$75,001-\$100,000 <input type="checkbox"/>	\$100,001-\$150,000 <input type="checkbox"/>	\$150,001+ <input type="checkbox"/>

8. What is your annual household income?

Unsure ☐ 0-\$25,000 ☐ \$25,001-\$50,000 ☐ \$50,001-\$75,000 ☐ \$75,001-\$100,000 ☐ \$100,001-\$150,000 ☐ \$150,001+ ☐

9. Is English your second language?

NO ☐ YES ☐....If YES, what is your first learnt language? _____

10. Where were you born?

Australia	<input type="checkbox"/>	Europe	<input type="checkbox"/>
Asia	<input type="checkbox"/>	Middle East	<input type="checkbox"/>
Africa	<input type="checkbox"/>	North America	<input type="checkbox"/>
Central America	<input type="checkbox"/>	South America	<input type="checkbox"/>

11. Are you currently ill, or have a medical or mental health condition?

NO ☐ YES ☐....If YES, please name _____

12. Have you ever been diagnosed with an eating disorder?

NO ☐ YES ☐....If YES, please name _____

13. Are you taking any medication, including non-prescription medications/remedies?

NO ☐ YES ☐....If YES, please name _____

14. Are you currently pregnant or lactating?

NO ☐ YES ☐

15. Are you currently going through the life stage of menopause?

NO ☐ YES ☐

16. What is your height?

_____cms or _____feet
or _____inches

17. What is your current weight?

_____kgs or _____pounds
or _____stones

18. Did you achieve this current weight after a conscious effort to lose weight?

NO ☐ YES ☐

18 a. For your most recent weight loss how long has it been between when you started losing weight and now? _____ or what month did you start? _____.

19. How much weight have you lost in the last 6 months?

_____ kgs or _____ pounds
or _____ stones

20. What method did you use to achieve your recent weight lose? (Tick all that apply)

- ☐ Dietary Intake/Diet ☐ Meal replacement, i.e. Shakes
☐ Diet & Exercise ☐ Pre-prepared meals
☐ Exercise ☐ Other _____
☐ Weight-loss club or structured program ☐

21. If you used a weight-loss club or structured weight-loss program to achieve your current weight which one was it?

- Weight Watchers ☐ Jenny Craig ☐
Tony Ferguson ☐ Lite n Easy
UltraLite ☐
Other _____

22. Are you still currently attending a structured weight-loss program or club?

NO ☐ YES ☐ Which one? _____

23. Are you currently engaged in a structured weight maintenance program?

NO ☐ YES ☐ Which one? _____

24. On average, how many days per week do you adhere to any specific weight-loss maintenance guidelines?

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
7 ☐

25. How much did you weigh before you lost weight this most recent time?

_____ kgs or _____ pounds
or _____ stones

26. What was your goal weight when you decided to start losing weight this time?

_____ kgs or _____ pounds
or _____ stones

27. Did you achieve this goal weight?

NO ☐ YES ☐

28. What was your overall satisfaction with the total amount of weight you lost?

Very ☐ Dissatisfied ☐ Neither Satisfied ☐ Satisfied ☐ Very ☐
Dissatisfied or Dissatisfied Satisfied

29. What is your current level of satisfaction with your weight?

Very ☐ Dissatisfied Dissatisfied ☐ Neither Satisfied ☐ or Dissatisfied Satisfied ☐ Very ☐ Satisfied

30. How difficult or easy has it been to maintain a weight you are happy with this time?

Very ☐ Difficult Difficult ☐ Neither Easy ☐ or Difficult Easy ☐ Very ☐ Easy

31. What are your current weight related intentions?

Maintain current weight ☐ Lose weight ☐ Gain weight ☐

32. How many times have you tried to lose weight over your life?

1 ☐ 10-12 ☐
 2-3 ☐ 13-15 ☐
 4-6 ☐ 15-20 ☐
 7-9 ☐ More than 20 ☐

33. Not including your most recent attempt, in the past have you achieved your goal weight following an intentional weight loss effort?

NO ☐ YES ☐

34. What is your maximum lifetime weight (not including pregnancy)?

_____ kgs or _____ pounds
 or _____ stones

35. How often do you weigh yourself?

Almost never ☐ More than twice a week ☐
 A few times per year ☐ Once a day ☐
 1-3 times per month ☐ More than once per day ☐
 Once a week ☐

36. Are you currently seeking any psychological therapy, psychotherapy or counselling directly related to your weight?

NO ☐ YES ☐

Thank you for completing this questionnaire ☺

It is recommended that if you are concerned about your physical or mental health that you consult your General Practitioner to access appropriate services.

Appendix P:
Participant Handbook

ACTing on Weight

Acceptance and Commitment Therapy
for
Emotional Eating & Weight Loss Maintenance

Participant Handbook

By:

Emma Gallagher, Doctor of Psychology (Clinical) Candidate
Dr. Cate Bearsley-Smith, Clinical Psychologist

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Metaphor: COMPASS

“Values are like a compass. A compass gives you direction and keeps you on track when you are travelling. And our values do the same for the journey of life. We use them to choose the direction in which we want to move and to keep us on track as we go. So when you act on a value, it’s like heading west. No matter how far west you travel, you never get there; there’s always further to go. But goals are like the things you try to achieve on your journey: they’re like the sights you want to see or the mountains you want to climb while you keep on travelling west” (Harris, 2009, p. 192).

Metaphor: THE PROBLEM SOLVING MACHINE

“If we had to pick one ability of the human mind that has enabled us to be so resourceful that we’ve not only changed the face of the planet, but also travel outside it, it’d have to be our capacity for problem solving. The essence of problem solving is this: A problem means something unwanted. And a solution means avoid it or get rid of it. Now in the physical world, problem solving often works very well. A wolf outside your door? Get rid of it: throw rocks or spears at it. Snow, rain, hail? Well, you can’t get rid of those things, but you can avoid them by hiding in a cave, building a shelter, or wearing protective clothes. Dry, arid ground? You can get rid of it by irrigation and fertilisation, or you can avoid it by moving to a better location. So your mind is like a problem-solving machine, and it’s very good at its job. And given that problem-solving works so

well in the material world, it's only natural that our mind tries to do the same thing with our inner world: the world of thoughts, feelings, memories, sensations, and urges. Unfortunately all too often when we try to avoid or get rid of unwanted thoughts and feelings, it doesn't work – or if it does work, we end up creating a lot of extra pain for ourselves in the process” (Harris, 2009, p. 23-24).

Metaphor: STRUGGLING IN QUICKSAND

“Remember those old movies where the bad guy falls into a pool of quicksand, and the more he struggles, the faster it sucks him under? In quicksand, the worst thing you can possibly do is struggle. The way to survive is to lie back, spread out your arms and legs, and float on the surface. This is very tricky, because every instinct in your body tells you to struggle, but if you do what comes naturally and instinctively, you'll drown. And notice, lying back and floating is psychologically tricky - it doesn't come naturally - but it's a lot less physical effort than struggling”(Harris, 2009, p. 92).

Metaphor: DELETE A MEMORY

“Just take a moment to remember how you got here today. Done that? Okay, now delete that memory. Just get rid of it... How'd you do?” (Harris, 2009, p. 94).

Metaphor: NUMB YOUR LEG

“Now make your left leg go completely numb. So numb that I could cut it off with a hacksaw and you wouldn't feel a thing... How'd you do?” (Harris, 2009, p. 94).

Metaphor: DON'T THINK ABOUT...

“Suppose I tell you right now that I don't want you to think about something. I'm going to tell you very soon. And when I do, don't think it even for a second. Here it comes. Remember, don't think of it. Don't think of...warm chocolate cake! You know how it smells when it first comes out of the oven...Don't think of it! The taste of the chocolate icing when you bite into the first crumbles and crumbs fall to the plate...Don't think of it! It's very important; don't think about any of this” (Hayes, et al., 196, p. 124).

Metaphor: THE POLYGRAPH

“Imagine I'm a mad scientist and I've kidnapped you for an experiment. And I've wired you up to a super sensitive polygraph, or lie detector. This machine will detect the tiniest bit of anxiety in your body. You can't kid it. Even the tiniest hint of anxiety and all the alarms bells will ring. And in this experiment I'm about to do on you, you must not feel any anxiety at all. And if you do, then I'll pull this lever which will electrocute you'. Do you think you

would be able to control your anxiety will anticipating this?" (Harris, 2009, p. 94).

Metaphor: DEMONS ON THE BOAT

“Imagine your steering a boat out at sea. And there are these big scary ugly demons that live beneath the deck. And they've made a deal with you. As long as you drift aimlessly out at sea, they'll stay beneath the deck so you don't have to look at them. So this is OK for awhile. But then you see all the other boats heading toward the shore. And you know that's really where you want to go. You've got maps and plans - there are places you want to see. So you pluck up courage and you turn the tiller and head towards the shore. But the instant the boat changes direction all the demons rush up from below deck and threaten to tear you to pieces. And they look mean. And they're huge. Razor-sharp teeth. Massive horns. Enormous claws. And they say, "We're going to tear you to shreds. "We're going to rip you to pieces." So you're terrified. And you say "Whoa! Sorry, demons!" And you turn the boat around and head back out to sea. As soon as the boat is drifting aimlessly once more, the demons disappear. You go "Phew!" and breathe a sigh of relief. And for a awhile, it's okay - drifting without any direction. But then once more, you see all those other boats heading toward the shore. And you look down at your maps and plans. And you know where you really want to go. So again, you pluck up courage, turn the tiller, and the instant the boat changes direction, the demons are back. "We're

gonna kill you!" Now here's the thing: although these demons have been threatening to kill you your whole life, they've never actually harmed you. That's because they can't. They have no capacity to harm you. All they can do is threaten you. And as long as you believe that they're going to do the things they say they're going to do, they've got control of the boat. So - armed with this knowledge - if heading toward the shore really matters, what do you need to do?... That's right, you need to keep your hands on the tiller and keep heading toward the shore. The demons will then gather around and try to intimidate you. But that's all they can do. And as you let them gather around, you'll be able to get a good look at them in direct sunlight. And you'll realize that they're nowhere near as big and nasty as they appeared, they were using special effects to make themselves seem ten times their real size. And as you keep your hands on that tiller, heading toward the shore, you notice that there's an entire boat here. And there's the sky, and the sea, and the sun, and the wind - and fish, and birds and other ships; there's a whole world out there to explore and appreciate, not just these demons. And notice that no matter how far you are from the shore, the instant you turn that tiller, you're on an adventure, you're instantly moving in the direction you want to go, instead of drifting aimlessly" (Harris, 2009, p. 148).

Metaphor: DEMONS ON THE BOAT

YouTube: <http://www.youtube.com/watch?v=z-wyaP6xXwE&feature=related>

Exercise: NAMING THE STORY

“Suppose we took all your thoughts, and all the painful feelings and memories that go with them, and we put them all into a documentary of your life, or an autobiography. And suppose you were to give that film or book a short title – the “something something story”, for example, the “I’m no good” story or the “life sucks” story – then what would you call it?” (Harris, 2009, p. 128)

Exercise: I’M HAVING THE THOUGHT THAT...

“Put your negative self-judgement into a short sentence – in the form “I am X”. For example I’m a loser or I’m not smart enough.

Now fuse with this thought for ten seconds. In other words, get all caught up in it and believe it as much as you possibly can.

Now silently replay the thought with this phrase in front of it: “I’m having the thought that...” For example, “I’m having the thought that I’m a loser”.

Now replay it one more time, but this time add this phrase, “I’m *noticing* I’m having the thought that...” For example, “I’m *noticing* I’m having the thought that I’m a loser” (Harris, 2009, p. 109).

Exercise: LEAVES ON A STREAM

“1. Find a comfortable position, and either close your eyes or fix your eyes on a spot, which ever you prefer.

2. Imagine you’re sitting by the side of a gently flowing stream, and there are leaves flowing past on the surface of the stream. Imagine it however you like – it’s your imagination.

3. Now, for the next few minutes, take every thought that pops into your head, place it on a leaf, and let it float on by. Do this regardless of whether the thoughts are positive or negative, pleasurable or painful. Even if they’re the most wonderful thoughts, place them on the leaf and let them float by.

4. If your thoughts stop, just watch the stream. Sooner or later your thoughts will start up again.

5. Allow the stream to flow at its own rate. Don’t speed it up. You’re not trying to wash the leaves away – you’re allowing them to come and go in their own good time.

6. If your mind says “*This is Stupid*” or “*I can’t do it*”, place those thoughts on a leaf.

7. If a leaf gets stuck, let it hang around. Don’t force it to float away.

8. If a difficult feeling arises, such as boredom or impatience, simply acknowledge it. Say to yourself, “Here’s a feeling of boredom” or “Here’s a feeling of impatience”. Then place those words on a leaf, and let the leaf float on by.

9. From time to time, your thoughts will hook you, and you’ll lose track of the exercise. This is normal and natural, and it will keep happening. As soon as you realise it’s happened, gently acknowledge it and then start the exercise again” (Harris, 2008, p. 113).

Metaphor: THE STRUGGLE SWITCH

“Imagine that at the back of our mind is a "Struggle Switch." When it is switched on, it means we're going to struggle against any physical or emotional pain that comes our way. Whatever discomfort shows up, we'll try our best to get rid of it or avoid it. Suppose what shows up is Anxiety. If my struggle switch is on, then I absolutely have to get rid of that feeling! It's like "Oh no! Here's that horrible feeling again. Why does it keep coming back? How do I get rid of it?" So now I've got anxiety about my anxiety. In other words my anxiety just got worse. "Oh no! It's getting worse! Why does it do that?" Now I'm even more anxious. Then I might get angry about my anxiety: "It's not fair. Why does this happening?" Or I might get depressed about my anxiety: "Not again. Why do I always feel like this?" And all these secondary emotions are useless, unpleasant, unhelpful, and a drain on my energy and vitality. And then-guess

what? I get anxious or depressed about that! Spot the vicious cycle? But now suppose my struggle switch is off. In that case, whatever feeling shows up, no matter how unpleasant, I don't struggle with it. So anxiety shows up, but this time I don't struggle. Its like, "Okay, here's a knot in my stomach. Here's tightness in my chest. Here's sweaty palms and shaking legs. Here's my mind telling me a bunch of scary stories." And it's not that I like it or want it. It's still unpleasant. But I'm not going to waste my time and energy struggling with it. Instead I'm going to take control of my arms and legs and put my energy into doing something that's meaningful and life enhancing.

So with the struggle switch off, our anxiety levels are free to rise and fall as the situation dictates. Sometimes they'll be high, sometimes low, and sometimes there will be no anxiety at all. Far more importantly, we're not wasting our time and energy struggling with it. But switch it on, and it's like an emotional amplifier. We can have anger about our anger, anxiety about our anxiety, depression about our depression, or guilt about our guilt.

Without struggle, we get a natural level of physical and emotional discomfort which depends on who we are and what we're doing. In ACT, we call this "clean discomfort." There's no avoiding "clean discomfort [Pain A]." Life serves it up to all of us in one way or another. However, once we start struggling with it, our discomfort levels increase rapidly. We call this additional

suffering "dirty discomfort [Pain B]". We can't do anything about the clean discomfort, but we can reduce the dirty discomfort” (Harris, 2009, p. 149).

Metaphor: ACCEPTANCE OF EMOTION

Options:

“**THE CURIOUS SCIENTIST**: Notice where this feeling is in your body. Zoom in on it. Observe it as if you are a curious scientist who has never encountered anything like this. Where are the edges? Where does it start and stop? Is it moving or still? Is it at the surface or inside you? Hot or Cold? Light or heavy?” (Harris, 2009, p. 146).

“**ALLOWING**: See if you can allow this feeling to be there. You don’t have to like it or want it – just allow it.” (Harris, 2009, p. 146).

“**BREATHE INTO IT**: Breathe into this feeling. It’s as if your breath flows into and around it.” (Harris, 2009, p. 146).

Exercise: TAKE TEN BREATHS

“This is a simple exercise to centre yourself and connect with your environment. Practice it throughout the day, especially any time you find yourself getting caught up in your thoughts and feelings:

1. Take ten slow, deep breaths. Focus on breathing out as slowly as possible until your lungs are completely empty - and then allow them to refill by themselves.
2. Notice the sensations of your lungs emptying. Notice them refilling. Notice your rib cage rising and falling. Notice the gentle rise and fall of your shoulders.
3. See if you can let your thoughts come and go as if they're just passing cars, driving past outside your house.
4. Expand your awareness: simultaneously notice your breathing and your body. Then look around the room and notice what you can see, hear, smell, touch and feel” (Harris, 2009, p. 171).

Exercise: DROPPING ANCHOR

“This is another simple exercise to centre yourself and connect with the world around you. Practice it throughout the day, especially any time you find yourself getting caught up in your thoughts and feelings:

1. Plant your feet into the floor.
2. Push them down-notice the floor beneath you, supporting you.
3. Notice the muscle tension in your legs as you push your feet down.

4. Notice your entire body - and the feeling of gravity flowing down through your head, spine, and legs into your feet.
5. Now look around and notice what you can see and hear around you. Notice where you are and what you're doing” (Harris, 2009, p. 171).

Exercise: NOTICE FIVE THINGS

“This is yet another simple exercise to centre yourself and engage with your environment. Practice it throughout the day, especially any time you find yourself getting caught up in your thoughts and feelings:

1. Pause for a moment.
2. Look around and notice five things that you can see.
3. Listen carefully and notice five things that you can hear.
4. Notice five things that you can feel in contact with your body. (For example, your watch against your wrist, your trousers against your legs, the hair on your face, your feet upon the floor, your back against the chair.)
5. Finally, do all of the above simultaneously” (Harris, 2009, p. 171).

Metaphor: THE SKY AND THE WEATHER

“Your observing self is like the sky. Thoughts and feelings are like the weather. The weather changes continually, but no matter how bad it gets, it

cannot harm the sky in any way. The mightiest thunderstorm, the most turbulent hurricane, the most severe winter blizzard-these things cannot hurt or harm the sky. And no matter how bad the weather, the sky always has room for it - and sooner or later the weather always changes.

Now sometimes we forget the sky is there, but it's still there. And sometimes we can't see the sky-it's obscured by clouds. But if we rise high enough above those clouds, even the thickest, darkest, thunderclouds, sooner or later we'll reach clear sky, stretching in all directions, boundless and pure. More and more you can learn to access this part of you: a safe space inside from which to observe and make room for difficult thoughts and feelings” (Harris, p. 175).

Exercise: MINDFULLY EATING A SULTANA

“The ellipses represent pauses of five seconds.

Throughout this exercise, all sorts of thoughts and feelings will arise. Let them come and go, and keep your attention on the exercise. And whenever you notice that your attention has wandered, briefly note what distracted you, and then bring your attention back to the sultana.

Now take hold of the sultana, and observe it as if you're a curious scientist who has never seen a sultana before... Notice the shape, the colours, the contours... Notice that it's just not one colour - there are many different shades

to it...Notice the weight of it in your hand...and the feel of its skin against your fingers...Gently squish it and notice its texture...Hold it up to the light and notice how it glows...Now raise it to your nose and smell it...Really notice the aroma...and now raise it to your mouth, rest it against your lips, and pause for a moment before biting into it... And notice what's happening inside your mouth...Notice the salivation...notice the urge to bite...And in a moment-don't do it yet - I'm going to ask you to bite it in half, keeping hold of one half and letting the other half drop onto your tongue....And so now, in ultraslow motion, bite the sultana in half, noticing what your teeth do...and let the sultana sit there on your tongue for a moment...and I invite you to close your eyes now, to enhance the experience...and just notice any urges arising...And then gently explore the sultana with your tongue, noticing the taste and the texture...and now, in ultraslow motion, eat the sultana and notice what your teeth do...and your tongue...and your jaws...and notice the changing taste and texture of the sultana...and the sounds of chewing...and notice where you can taste the sweetness on your tongue...and when the urge to swallow arises, just notice it for a moment before acting on it...and when you do swallow, notice the movement and the sound in your gullet...and then notice where your tongue goes and what it does...and after you've swallowed, pause...and notice the way the taste gradually fades...but still faintly remains...and then, in your own time, eat the other half in the same way” (Harris, 2009, p. 163-164).

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Appendix Q:
1-Day ACTing on Weight Treatment Protocol



ACTing on Weight

An Acceptance and Commitment Therapy Intervention
for Emotional Eating and Weight Loss Maintenance

Facilitator Manual

Treatment Protocol

By:

Emma Gallagher, Doctor of Psychology (Clinical) Candidate

Dr. Cate Bearsley-Smith, Clinical Psychologist

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Disclaimer

This protocol has been adapted from the:

Obesity Stigma and Weight Management Acceptance and Commitment Therapy Treatment Manual (2008) by Jason Lillis, M.A., Steven C. Hayes, Ph.D. and Kara Bunting at the University of Nevada, Reno.

Permission to use this original work was granted by Jason Lillis. It is with much appreciation that we used the original protocol and adapted it to help in exploring the efficacy of an Acceptance and Commitment Therapy intervention for emotional eating and weight loss maintenance for people in Melbourne, Australia. In addition, the original work relied heavily on two other publications: Hayes, Strosahl and Wilson (1999), and Hayes and Smith (2005), and as such these have also been used in this work. Thank you to all the authors for the years of work they have put into these publications.

We would also like to acknowledge the work of Dr. Russel Harris. Russ has a fantastic ability to make ACT simple, and thus his work 'ACT Made Simple' has had a significant impact on our understanding of ACT, and in turn a significant impact on this ACT protocol. Permission was sort and granted by Dr. Harris to use worksheets and exercises from his publication for non-for profit research purposes. We use them with much appreciation.

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Facilitator Knowledge

It is expected that this protocol be used by people trained in, and have a thorough understanding, of ACT. Facilitators will need to know how to transition between the core processes of ACT throughout the workshop according to participant questions and experiences whilst respectfully bring the group back to the protocol content.

The minimum reading required is:

- 1) Hayes, S., Strosahl, K., & Wilson, K. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change*. New York: The Guilford Press.
- 2) Hayes, S., & Smith, S. (2005). *Get out of Your Mind and into your Life: The New Acceptance and Commitment Therapy*. Oakland: New Harbinger Publications, Inc.
- 3) Harris, R. (2009). *ACT made simple*. Oakland: New Harbinger Publications, Inc.

Resources to Run this Workshop

- Private and safe space with chairs and tables
- At least two whiteboards
- Pens and paper for participants
- Participant lunch
- Tea, coffee, morning and afternoon tea food items
- Optional: Data projector and computer
- Sultanas and individually wrapped chocolates

Welcome

Introduction

- Welcome participants

Example:

*“Good Morning, as you know, my name is _____ and I will be facilitating today’s workshop for you”

*“Thank you for coming along today. Your participation is helping us understand more about the challenges of emotional eating and weight loss maintenance, and in return my aim today is to help you with these struggles using Acceptance and Commitment Therapy.

Housekeeping

- Housekeeping: restrooms, breaks, kitchen, water, building access etc.

Example:

*“Before we start let me do some housekeeping: restrooms; front doors are locked; we will take regular breaks with tea & coffee supplied.

- Expected finish time today is: _____

About This Workshop

[Facilitator note: ACT Principle of Informed Consent]

This workshop uses Acceptance and Commitment Therapy (ACT)

- Inform participants that ACT is being used
 - Provide a small introduction to ACT and that ACT has been shown to be helpful for health related problems, e.g. smoking.
 - Most importantly there are studies showing that ACT is helpful for weight management.

Example:

*“So, just to clarify, the workshop approach we are going to be using today is called Acceptance and Commitment Therapy, or ACT for short”.

*“ACT is viewed as a ‘newer’ form of psychotherapy although it has been around for a while and there is a lot of evidence showing that it is helpful”.

*“For example ACT has been shown to be helpful for Quitting Smoking: One research study shows that after one year, people who participated in an ACT workshop performed better than those who were given Nicotine Replacement Therapy (NRT), with quit results 35% v 15% in favour of ACT. In addition, predictions could be made that show that participants who participated in the ACT workshop were 82% more likely to quit smoking than those who received the NRT”.

*“I could give you a number of pages of research examples showing ACT can be helpful – but most groups thank me that I don’t! If anyone wants examples I can provide them for you” NB: Have examples on hand to give to those who ask at the end of the workshop: e.g “anxiety, depression, chronic pain, and control of diabetic symptoms, and in the corporate world it has been shown to be helpful for burnout” (Harris, 2009, p. 30).

*“Most importantly for you, there have been recent studies published that show ACT has helped people with their weight”.

Workshop Experiential Nature and ‘Rules’

- Before participants introduce themselves, inform participants about the experiential nature of the workshop, the rules/expectations, and that being anxious is normal.

Example:

*“In a moment we are going to introduce ourselves, but before we do that I just want to remind you that...

*“Today we are going to be talking about things that people find very personal and difficult, and we want this to be a safe space for people to say what they need to. So, everything is confidential: it’s the old saying “what is said in the room stays in the room”.

*“We will also be using lots of practical/experiential exercises and metaphors in our learning today. These exercises are designed to safely challenge your comfort zone”.

*“To get the most out of today you need to be in the room, and have your mobiles off please”.

*“It is possible that you might be feeling anxious or nervous about this workshop – that means that you’re normal! Our weight is a very private and personal thing for us and we don’t often talk about it with strangers”.

Participant Introductions and Participant Expectations

- Ask participants to introduce themselves and to give a sentence about their expectation of the workshop. And introduce self at the end [Facilitator note: self disclosure according to ACT principles]. *Record expectations on the whiteboard.*
- At the end, open the discussion up so the group to refine expectations before moving on. At the end thank participants for sharing.

Example:

*“So, I’d just like to take a few minutes to give each other an opportunity to introduce ourselves and for you to give me a sentence about your expectations of today”. *As recording on the whiteboard note similarities and difference in a non-judgmental way.*

*“Thank you for sharing. It’s good to hear everyone’s expectations because that is really going to help us focus today”.

Workshop Aims

What are we going to be doing today?

- Inform participants that the workshop is going to be about two main questions:

I want to know

***What Sort of Life Do You Want?** [Facilitator Note: Values]

&

***What is Getting In The Way of the Life you Want?** [Facilitator Note: Barriers of Cognitive Fusion and Experiential Avoidance]

- Inform participants that you will teach them ACT skills to help them with emotional eating.

You want to know ***How can I, and my ACT approach, Help You with Emotional Eating and Your Weight?**

So, today is about addressing these questions...

How can ACT help you?

What is the aim of ACT?

- Inform participants what the aim of ACT is
 - Be mindful of explaining what words in ACT mean, like ‘pain’ for example.
- Inform them that in ACT one of the main ideas is that having difficult experiences is a normal and inevitable part of human life.
 - But that, even though pain is normal, that doesn’t mean you need or want to be struggling with it.
- Talk about the struggle and that the ultimate aim of ACT is to: help you live the life you want, without struggle.

Example:

*“So, the aim of ACT is: to help people “create a rich, full and meaningful life, while accepting the pain that life inevitably brings” (Harris, 2009, p. 2).

- When I use the word ‘pain’ throughout today it is a substitute for: any thought or feeling that is uncomfortable, unpleasant, difficult, challenging or unwanted – so that is any painful or difficult experiences.

*“Put another way: ACT is about you living the life you want even though you will experience difficult things in your life”

*“So, here in lies one of the main points of today:”

In ACT we believe that having difficult experiences is a normal and inevitable part of human life.

*“However, the second main point is that:”

Even though pain is normal, that doesn’t mean you need or want to be struggling with it.

*“It is the ‘struggle’ with normal pain that makes life more difficult”.

*“We use the word struggle a lot in ACT, and it was very interesting that when I spoke to people about coming along today almost everyone stated that they were struggling with their weight. **It is this struggle we are aiming to help you with”.**

The ultimate aim of ACT: To help you live the life you want, without struggle.

Refer participants to the Workshop Handout p.1: AIM of ACT

Present Awareness: Setting the Scene

[Facilitator note: ACT Principle of Present Moment]

1st Experiential Exercise

- Inform participants that before work begins on dissecting their struggle, they are invited to participate in a MINDFULNESS exercise to bring their awareness into the present.

Example:

*“Before we start working on dissecting the struggle, I invite you now to take a few minutes with me to do a mindfulness exercise that will help us with the work we are going to do today – it will help us be in the present moment”.

Facilitator Action: Read the ‘ACT In a Nutshell’ Mindfulness Exercise script (Harris, 2008). NB: small adaptations were made to the original script.

NB: this particular exercise was chosen as it touches on each of the six ACT processes in one exercise.

Facilitator Action: Exercise Debrief: Ask for reactions from participants.

The Struggle

[Facilitator note: ACT Principle of Creative Hopelessness]

My Struggle

- Inform participants they are going to spend some time connecting with their emotional eating and weight struggles. Introduce the worksheet.
 - Guide them to “really get into it”

Refer participants to the Workshop Handout worksheet p.2: My Struggle or Suffering List.

Example:

*“Now I would like you to start connecting with your weight and emotional eating struggle. You can start with some of the things we mentioned earlier. But this time get really ‘into it’”.

*I want you to list all the difficult thoughts, feelings and behaviours related to your emotional eating and your weight; what thoughts really get you down; what does your mind say when it really wants to beat you up; what feelings do you really wish didn’t show up; I want you to get all ‘radio doom and gloom’; what have you tried?

*“Write these things on your struggle list”.

...Lead into an open discussion in the next section

The Emotional Eating and Weight Struggle: Open Discussion

[Facilitator note: continuing ACT Principle of Creative Hopelessness]

Open discussion about the struggle of emotional eating and weight

- Inform participants you will help them have an open discussion about their struggle with emotional eating and weight.

Facilitator AIM: > Careful guiding of the discussion

- THE AIM of the facilitator is to guide the conversation and content to show that by using food as an 'avoidance strategy' original distress is amplified.
- The aim also includes highlighting that actions used to 'get rid of' unpleasant thoughts and feelings only work in the *very* short term, and the original distress remains in the long term, and that original distress is also amplified by new distress created by the avoidance (and fusion).
- Focus on thoughts, feeling and behaviours
- Use the whiteboard to record thoughts, feeling and behaviours. Do this in a way that will show the cycle of avoidance by the end of the discussion.

Facilitator Discussion Guide: > Use the below Discussion Guide to help with this group discussion. Items are not listed in any particular order and each group will come from it at different angles. The facilitator needs to know the content and be skilled at formulating group content in ACT terms and reflecting the content back to the group from an ACT perspective.

Discussion Guide: >

- What is emotional eating?
- How does emotional eating help you?
- What does emotional eating help us do with our thoughts and feelings
- What thoughts and feelings have you tried to get rid of?
- What thoughts and feelings would you have if you didn't eat?
- How many times have you tried to lose weight?
- How much effort have you put into losing weight?
- How much time and effort do you put into thinking about food?
- What does your mind say about you, weight and eating?
- Have you been able to get rid of these thoughts and feelings, ever?
- What's the longest you have been able to get rid of these thoughts and feelings?
- What has stopped you reaching your goals?
- What have you done to control your feelings and weight?
- When you lose weight do the thoughts and feelings go away?

NB: for helpful hints refer to Harris (2009, p. 54, 88-89)

To end:

- Summarise content
- Thank participants for sharing their experiences

Life Draining Actions

Your Life Draining Actions

- Introduce the next worksheet that is designed to further clarify what each participant is doing in their life that acts to keep them stuck.
 - What does this weight struggle stop you doing or being?
 - It is about listing the things *that you do that make your life worse in the long run* – Life Draining Actions.

Refer participants to the Workshop Handout worksheet p.3: Your Current Struggles: What have you got – Your Life Draining Actions

Example:

*“So, similar to what we have just talked about – you eat to make yourself feel better but it doesn’t help in the long run. What else do you do? What keeps you stuck, wastes your time and money, drains your energy, impacts your relationships. So this includes all the things you try to get rid of, avoid, suppress, escape or distract yourself from the difficult thoughts and feelings you have about your weight and eating. Notice that there might be things that can be perceived as beneficial things, like being really busy or helping everyone”.

Facilitator Action: Exercise Debrief: Ask for reactions from participants.

Living The Life You Want, & Values?

[Facilitator note: ACT Principle of Values]

The Life You Want?

- Transition from struggling to discovering “what you really want in your life.”
 - This is designed to elicit values
- Introduce the next worksheet in the **Workshop Handout worksheet p.4: If Emotional Eating and My Weight were not such a problem for me...**
 - There are two questions, just worded a little differently.
 - *If, XXXXXX, weren't such a problem for me I would.....
 - * If I didn't have XXXX I would.....

Facilitator Action: Exercise Debrief

Example:

- This last exercise is designed to help you to start thinking about what you really want your life to look like.
- What you want to stand for in life.
- What really matters to you in the ‘big picture’.
- We need to know this because ultimately **the aim of ACT is to help you live the life you want.**

Knowing what we want helps us to connect to our values

- Introduce participants to VALUES: Thinking about what we want helps us to start connecting with our values, and the better we know our own values the more they can help us live a life that we feel is fulfilling.

What are Values?

- Clarify what values are – because they can be a bit elusive.

Values are:

- ‘statements about what we want to be doing in our life’
- ‘about what we stand for’
- ‘and how we want to behave on an ongoing basis’ (Harris, 2009, p. 189).

Values are important because:

- When you live according to your values you feel fulfilled.
 - When you do not live according to your values you feel conflicted.
- Values act as a guide for our behaviour
 - Values help us decide what to do in the moment – if I choose X behaviour - is that in line with my values and what I really want.
 - If you know your values they can act as a short-cut for when you need to make choices.

The other thing about values is that we can use them instead of goals to define our success.

Values vs Goals

- Let's consider what Russ Harris, one of Australia's top ACT trainers says about this.
 - He says that if we define success as 'living by our values'...we can be successful right now even though our goals may be a long way off (Harris, 2009, p. 195).

- Let's look at some **examples of goals versus values** from Russ Harris (2009):

"To lose ten [kgs] of weight is a goal, eating healthy is a value.

To go to the gym is a goal, caring for your body is a value.

To have a big house is a goal, supporting your family is a value.

To get love and respect from others is a goal, to be loving and respectful is a value.

To feel less anxious is an emotional goal, acting courageously is a value" (Harris, 2009, p. 193).

More on Values

- Values: have no end point, you cannot cross them off your list (but they can change), they are about ongoing action and what's important to you.
- Our values are like a compass.
 - Lead to **Metaphor Reading**

Metaphor Reading: The Compass Metaphor (Harris, 2009, p. 192).

Also in the: **Participant Handbook, p. 1**

Facilitator Action: Exercise Debrief

Values Exercise

- Introduce the next worksheet in the **Workshop Handout p.5: The Life You Want**
 - Defining your values will help you know What Sort of Life You Want, and then also help you achieve it.
 - Explain the worksheet.

Morning Tea Break

Control is The Problem

[Facilitator note: ACT Principle The Control Agenda]

Trying to Control Thoughts and Feelings

- Transition into highlighting to participants that from what we have discovered so far today it seems as though **trying to control thoughts and feelings is the problem.**

Example:

*“From what we have been discussing so far we can see that everyone here has put a lot of time and effort into:

- **trying to get their thoughts and feelings under control**
- **or put another way, trying to problem solve away difficult thoughts and feelings away.**
 - **AND EMOTIONAL EATING has been one of those things we have used to do that.**

Trying to Control Thoughts and Feelings DOESN'T WORK

- Transition into highlighting to participants that this type of problem solving doesn't seem to work in the long run, in fact this 'trying to get rid of it' or the 'avoid it' strategies that seem to make it worse.
 - Lead to **Metaphor Reading**

Metaphor Reading: The Problem Solving Machine Metaphor (Harris, 2009, p. 23-24). Also in the: **Participant Handbook, p. 1**

Facilitator Action: Metaphor Debrief

Linking Emotional Eating and Trying to Control Thoughts and Feelings

- Transition into a discussion about how emotional eating is a flawed control strategy and an avoidance strategy.

Example:

*“Emotional Eating helps us to ‘avoid or get rid of unwanted thoughts and feelings such as boredom, loneliness, anxiety, guilt, anger, sadness and so on” (Harris, 2009, p. 24).

*“In the short term, it seems to help, it temporally helps us feel better”.

*“But in the long run, it causes more unwanted thoughts and feelings which add to our original thoughts and feelings we were trying to avoid”.

Facilitator Action:

- Use whiteboard from earlier emotional eating discussion to demonstrate how emotional eating is an avoidance strategy and a vicious cycle of pain. NB: the terms Pain A and Pain B were used instead of the traditional ACT terms clean vs dirty, Hayes et al. (1999)

Pain A vs Pain B

- Introduce the next worksheet in the **Workshop Handout worksheet p.6:**
Pain A + Pain B = Struggle
 - Focus on the Pain B pathway that leads to struggle town.

Pain A vs Pain B: ReThink

- Introduce the next worksheet in the **Workshop Handout worksheet p.7:**
Pain A = Normal Pain
 - Focus on the Pain A pathway that leads to normal experiences of pain.

Discussion Guide: >

- As humans we all experience difficult thoughts and feelings.
- This is normal part of being human. In fact as a human we will inevitable experience painful feelings and thoughts. For example when a loved one dies you will feel pain – and this is normal human pain. It doesn't mean you have to like it, you just need to know that it is normal.
- We can call this normal pain, Pain A.
- Pain A is pain that is an inevitable part of being human.
- If we try and avoid Pain A, by for example emotionally eating (which might work for a little while) we cause ourselves extra pain. More pain in the long run.
 - We could call this pain, Pain B.
 - Pain B is additional pain. It is pain created by engaging in the struggle to control normal pain.
 - Pain B is 'suffering'.

Pain B is the pain created by the struggle to not feel 'normal' pain.

In ACT it is Pain B that we aim to reduce.

- Lead to **Metaphor Reading**

Metaphor Reading: Struggling in Quicksand (Harris, 2009, p. 92). Also in the: **Participant Handbook, p. 1**

Facilitator Action: Metaphor Debrief

Participant Examples of Quicksand:

- Ask participants to provide other tangible examples that are similar, where struggling actually makes things worse.
 - “slamming on the brakes when your car skids, swimming against a rip tide” (Harris, 2009, p. 93).

It’s Intuitive to Struggle

- Psycho education regarding the intuitive nature of struggling

Discussion Guide: >

- Doing the opposite is difficult and we have to be told or taught how to do it.
- It is similar with struggling with our emotions and thoughts – the intuitive thing to do is struggle against them.
- And it feels intuitive because in our culture we are socialised to believe that unpleasant or distressing thoughts and feelings need to be ‘gotten rid of’ because they are unhealthy, abnormal and problematic.

- We all get caught up in the idea that to be normal we need to either fix, ignore or get rid of unpleasant thoughts and feelings - this is how we all intuitively try and cope.
- However, in ACT we believe that trying to control our thought and feelings is what is responsible for our problems. The more we try and control how we think and feel the more we are caught in a vicious cycle – like we can see with our emotional eating (see Harris, 2009, p. 92).

Language & The Mind

[Facilitator note: ACT Principle of Language underlies ‘the problem’]

Up Side and the Down Side of Language

- Highlight to participants that language is both helpful and unhelpful.

<u>Helpful</u> - The Up Side	<u>Unhelpful</u> - The Down Side
Make maps and models of the world	Lie, Manipulate, Deceive
Predict and plan for the future	Slander/Libel, spread prejudice and ignorance
Share knowledge	Dwell on the past
Learn from the past	Judge and Compare – self and others, then feel guilty about being better off, sad about being worse off
Imagine things that have never existed – and then create them	Criticize – self and others. Be afraid of negative evaluations from others
Develop rules that guide our behaviour and help us thrive as a community	Fear future events – that haven’t even happened
Communicate with people who are far away	Be afraid you will gain weight – not be able to lose weight
Help us learn how to live longer	Remember past hurts, failures
Law enforcement	All these are only an instant away because of our verbal abilities. We can even get sad thoughts invading a happy day (Harris, 2009, p. 7; Lillis et al., 2008 p. 126)
Food production	
Disseminate information	
We create all these because we have language - verbal abilities.	
(Harris, 2009, p. 7; Lillis et al., 2008 p. 126)	

A Focus on The Down Side of Language

Psycho education component/points:

- The downside to language tends to have a really strong effect on our lives because our MINDS are like an unstoppable language generating machines.
- Our minds are Chatter Boxes that we can't shut up.
- Now, this is another important point: Have you noticed that our minds play language over and over to us in our heads. Our mind really really likes re-telling us 'Our Stories', for example: the 'I am not good enough' story, or the 'I can't do it' story.
- Naturally, we don't really like these stories and the feelings that go with them, so we try and get rid of them, we try to push them out of our minds, and tell ourselves to forget it etc.
- Again it seems sensible and intuitive and normal for us to try and get rid of the nasty things our MIND is saying to us.
- **But similar to what I have said about trying to avoid feelings, the question is: Does trying to get rid of thoughts work?**
 - **We all seem to keep doing it.**
 - **But, ACT says it doesn't work.**
 - **But let's double check this for ourselves!**
 - Lead to **Metaphor Readings x 3**

Metaphor Readings:

Delete a Memory (Harris, 2009, p. 94).

The Polygraph (Harris, 2009, p. 94).

Don't Think About Chocolate Cake (Hayes et al., 1999, p. 124).

Found in: **Participant Handbook, p. 2**

Facilitator Action: Metaphor Debrief

Letting Go of The Control Agenda: Commence Mindfulness

[Facilitator note: ACT Principle of letting go of the control agenda]

If Control Doesn't Work, What Do We Do?

- Transition from what is not working to what will work.

Example:

*“So, despite our best efforts, it appears that we have little control over both thoughts and feelings, and trying to avoid or control them does not seem to work”.

***“So, I hear you ask “If controlling thoughts and feelings doesn’t work what do we do?”**

Today we are going to give you an ACT Tool box.

- Lead to **Metaphor Readings**

Metaphor: Demons on the Boat (Harris, 2009, p. 148)

Or YouTube Video option:

<http://www.youtube.com/watch?v=z-wyaP6xXwE&feature=related>

Found in: **Participant Handbook, p. 4**

Facilitator Action: Metaphor Debrief

Include in this debrief:

*Regardless of what scary stories, thoughts and feelings you have you can steer your own boat. ACT helps you do this.

*ACT helps us eliminate Pain B as per previous worksheet.

The ACT Option Summarised

Normal Human Pain

- From the Pain A and Pain B worksheet, show participants the ACT summary handout **Workshop Handout worksheet p.8: Normal Human Pain**
 - Briefly explain the process, but not too much.

Experiential Exercise

- Inform participants that they are invited to engage in another mindfulness exercise.

Facilitator Action: Read the ‘Mindfully Eating a Raisin’ Mindfulness Exercise script (Harris, 2009, p. 163). NB: small adaptations were made to the original script.

Facilitator Action: Exercise Debrief: Ask for reactions from participants.

Experiential Exercise

- Inform participants that they are invited to engage in another mindfulness exercise. Eating their lunch mindfully for 2 minutes.

Lunch Break

Working with Painful and Persistent Thoughts

[Facilitator note: ACT Principle of cognitive fusion and defusion]

Experiential Exercise

- Inform participants that they are invited to engage in another mindfulness exercise.

Facilitator Action: Guide participants in the mindfulness exercise: Thoughts on a Card (Harris, 2009, p. 104-107)

Facilitator Action: Exercise Debrief

Notes for this debrief:

- The aim of this exercise is to show you that when we hold our thoughts too tightly we are restricted in what we can do. It hinders our ability to engage in the life that you want.
- So, when you were holding your thoughts really tightly up to your nose you couldn't see and you couldn't do much, you weren't fully engaged in life because you had something in your way.
- That is compared to when you held your thoughts more lightly, held them on your lap, you could see and also do more.
- So, this is about gaining some distance from your thoughts. Distance allows you to connect with more with what you want.

Cognitive Fusion

- Introduce the concept of Cognitive Fusion:
 - In ACT we call holding onto our thoughts really tightly ‘cognitive fusion’ or just ‘fusion’. Fusion interferes with our ability to connect with the life you want – Fusion is holding our thoughts to our face.
- Introduce the concept of Cognitive Defusion:
 - Instead of fusion, we can ‘defuse’, or hold our thoughts more lightly, so we still have the same thoughts but they are not dominating our lives and getting in the way of our actions.

Fusion synonyms:

Being “hooked or reeled in by thoughts, getting entangled or caught up in thoughts, or getting lost or swept away by them... Or... holding on tightly to your thoughts, refusing to let them go, dwelling on them, stewing on them, buying into them or being absorbed by them... Or... struggling with thoughts, getting bogged down by them, or allowing them to push you around... These metaphorical ways of speaking all convey the same theme: that our thoughts have a major impact on us, and we invest a lot of time, energy and effort in responding to them” (Harris, 2009, p. 108).

Defusion synonyms:

“noticing thoughts, observing thoughts, taking a step back and watching your thoughts, or letting thoughts come and go, holding them lightly or loosening your grip on them, or unhooking yourself, disentangling yourself, dropping the story and so on. These all convey the idea of departing from your thoughts and allowing them to do their own thing instead of investing your time and energy and effort in responding to them” (Harris, 2009, p. 108).

Workability

It's not about how true or false thoughts are

- Highlight to participants that cognitive fusion and defusion are not about how true a thought is, but about how workable they are.

Examples:

*One very important thing you need to know about defusion is that “in ACT we’re not so much interested in whether your thoughts are true or false, but whether they’re helpful” or lead to **workable actions** (Harris, 2009, p. 117).

*For example: “If you hold this thought too tightly, will it help you live the life you want? Will it help you achieve your goals, improve your relationship, or act like the person you want to be?” (Harris, 2009, p. 117).

Fusion vs. Believability Story: To help me explain read this example:

Facilitator Action: Read out story: Fusion vs. Believability – Naomi’s Story (Harris, 2009, p. 130).

Facilitator Action: Exercise Debrief

Participant exercise: Naming The Story

Facilitator Action: Read Naming The Story (Harris, 2009, p. 128).

Let's see how we can name our own story.

Each time the story comes up "name it" Aha, there's the XYZ story again!"

Facilitate note: Move from Workability back to Defusion

More Cognitive Defusion

More Defusion Exercises

- Guide participants in more defusion exercises.

Facilitator Action: Guide participants in the “I am having the thought that” exercise (Harris, 2009, p. 109). **Participant Handbook, p. 4**

Facilitator Action: Exercise Debrief

Facilitator Action: Guide participants in ‘Leaves on a Stream’ (Harris, 2009, p. 113) **Participant Handbook, p. 6**

Facilitator Action: Exercise Debrief

Thoughts v Actions

- Highlight that thoughts influence but do not control actions:

“Have you ever had thoughts and feelings you didn’t act on? For example, did you ever have the thought ‘I can’t do this’ but you went ahead and did it anyway? Did you ever have thoughts about yelling at someone or leaving your partner or quitting your job or call in sick, but you didn’t act on them? Did you ever feel angry but act calmly? Did you ever feel frightened but act confidently? Did you ever feel sad but act as if you were happy? Did you ever feel like running away from an awkward or stressful situation, but you stayed? What does this show you? Do your thoughts and feeling truly control your actions, or do you have some choice in how you act?” (Harris, 2009, p. 122).

Further:

“If our thoughts and feelings really controlled our actions, where would we be? Think of all those angry, resentful, vengeful thoughts and feelings you’ve had. Remember all those nasty things you thought about saying or doing to the people you were angry with. Imagine if those thoughts and feelings had controlled your actions – if you had actually done and done all those things. Where would we all be if our thoughts and feelings controlled our actions?” (Harris, 2009, p. 122).

To End this section:

- Check if participants have any questions/concerns before moving on to experiential avoidance/acceptance.

Additional notes on Defusion if needed:

- The aim of defusion “is to disentangle yourself from your thoughts so that you can be in the present moment and do the things you consider important” (Harris, 2009, p. 116). “If you hold on tightly to this thought, will it help you to live the life you want? (Harris, 2009, p. 132).
- When you start to practice defusing from your thoughts you learn that your thoughts don’t have to control your actions.
- Of course they influence your actions but they do not control your actions.
- It is about noticing that a thought can just be a thought and that you do not need to act on it. You can choose to act, but you don’t need to react.

Willingness

[Facilitator note: ACT Principle of experiential avoidance and acceptance]

Acceptance of Emotion

- Introduce Acceptance as a helpful process.

Example:

“So just like we have been talking about how it we can’t get rid of our thoughts, trying to push away feelings doesn’t work either. In fact research shows that when you try and push away feelings they come back stronger. Our answer to this is: Acceptance of Emotion. Or put another way: Willingness to Experience Emotions instead of trying to control or push them away or get rid of them”.

- Lead to **Metaphor Reading**

Metaphor Reading: The Unwelcome Guest (Instead of Joe The Bum: Hayes et al., 1999, p. 240).

NB: The original Joe The Bum metaphor reading does not translate well into the Australian culture. Instead Brian the Unwelcome Guest at the Party was used. <http://www.youtube.com/watch?v=VYht-guymF4>

Facilitator Action: Exercise Debrief

Notes for this debrief:

- “What the metaphor is about, of course, is all the feelings and memories and thoughts that show up that that you don't like; they're just more bums at the door. The issue is the posture you take in regard to your own stuff. Are the bums welcome? Can you chose to welcome them in, even though you don't like the fact that they came? If not, what's the party going to be like?” (Hayes et al.,1999, p. 240).
- “In plain language: acceptance means allowing our thoughts and feelings to be as they are, regardless of whether they are pleasant or painful; opening up an making room for them; dropping the struggle with them; and letting them come and go as they naturally do”. (Harris, 2009, p. 134).
 - Lead to **Metaphor Reading**

The Struggle Switch

Facilitator Action: Readout **The Struggle Switch** metaphor (Harris, 2009, p. 149) **Participant Handbook, p. 8**

Facilitator Action: Exercise Debrief:

- Lead to **Mindful Exercise**

Facilitator Action: Readout **The Acceptance of Emotion mindfulness exercise** (Harris, 2009, p. 137)

Facilitator Action: Exercise Debrief:

Notes for this debrief:

- “When we talk about acceptance of emotion I am not saying that you have to like all your emotions - “We don’t walk into pain because we like pain...We walk through pain in the service of taking valued direction” (Hayes et al., 1999, p. 247).
 - Remember the: Demon’s on the Boat – see if there is anything more in this the second time you see it?

Facilitator Action: Re-read or play **Demons on the Boat**.

Facilitator Action: Exercise Debrief:

Small Mindful Exercises

- Introduce a few quick and easy mindfulness exercises people can use in daily life.
 - Lead to **Mindful Exercises**

“THE CURIOUS SCIENTIST: Notice where this feeling is in your body. Zoom in on it. Observe it as if you are a curious scientist who has never encountered anything like this. Where are the edges? Where does it start and stop? Is it moving or still? Is it at the surface or inside you? Hot or Cold? Light or heavy?” (Harris, 2009, p. 146). **Participant Handbook, p. 10**

“ALLOWING: See if you can allow this feeling to be there. You don’t have to like it or want it – just allow it.” (Harris, 2009, p. 146). **Participant Handbook, p. 10**

“BREATHE INTO IT: Breathe into this feeling. It’s as if your breath flows into and around it.” (Harris, 2009, p. 146). **Participant Handbook, p. 10**

Important Note

In ACT “we wouldn’t want someone to accept pain, or practice defusion, or expose herself to challenging situations unless it served to make her life richer and fuller’ that is help live out ones values in life” (Harris, 2009, p. 189).

- Lead to **Revisit Workability**

Workable & Unworkable Actions: ACTing in accordance to your Values

It has to be Workable

- As touched on earlier, reiterate actions need to be workable.

Examples:

*In ACT we are trying to target control strategies that do not help you live the life that you want. Overall, most people use control strategies that do not enhance their life and don't help them live according to their values. So for us EE is a control strategy that does not work.

*This is an important point – we always need to think about behaviour in terms of our values. We need to answer the question, is the behaviour we are engaging in helping us live according to our values. In ACT we ask “is this a workable action”. Does it work to help me fulfil my values? If it helps me it is workable - if it doesn't it is “unworkable”.

Example: “Take eating chocolate, for example. When we eat a piece of good-quality chocolate, we feel good (assuming we like chocolate, that is). Use this simple control strategy in moderation, and it enriches our life: it's workable. But do it excessively, and it may well start to have costs on our health, such as weight gain” (Harris, 2009, p. 82). So here eating two pieces of chocolate is workable. Eating the whole block is not! We need to think about what works in the long run.

Workable V Unworkable

Mindful	Mindless
Valued	Fused
Willing	Avoidant
Effective	Ineffective

- Lead to **Mindfulness Exercise**

Facilitator Action: Guide **Mindful Eating** of luxury chocolate.

Facilitator Action: Exercise Debrief:

NB: Mindful vs Mindless Eating

Mindfulness

What is Mindfulness?

- Explain what mindfulness is, specifically in the ACT context.

Examples:

* All the exercises we have been doing today can be classified as mindfulness exercises and help you with your struggle switch.

*They are all designed to help you begin to practice being in the 'here and now' instead of being caught up in thoughts and feelings.

*When we are not in the moment, we miss opportunities, when we are in the moment, the here and now, we can embrace opportunities.

There are some more examples in your hand out. Nice, short ones.

Short Mindfulness Options: Take in Ten Breaths (Harris, 2009, p. 171)

Notice Five Things (Harris, 2009, p. 171):

Participant Handbook, p. 12

Facilitator Action: Exercise Debrief

To Sum: Mindfulness is about noticing. Noticing the here and now. Noticing thoughts and feelings, and body sensations – noticing the internal world. Noticing the external world. We could summaries all mindfulness activities down to “Notice X” (Harris, 2009).

Observing Self and Thinking Self

The Observing Self

- Introduce and explain the observing self in ACT terms.

Examples:

*“So, we are gradually discovering that we not only have the part of our mind that thinks, we also have a part of our mind that notices that we think”.

*“So we have our Thinking Self and our Observing Self”.

*“We are not really taught to use our observing self. This is a shame because our observing self gives us space from our thoughts and feelings, and it is from this space we can look at them, instead of looking from them. It is also a special place because regardless of what is going on in life this place stays the same”.

- Lead to **Metaphor**

Facilitator Action: Read **The Sky and Weather Metaphor** (Harris, 2009, p. 175). **Participant Handbook, p. 12**

Facilitator Action: Exercise Debrief

Notes for this debrief:

- In ACT this space is often called Self as Perspective – that is because this space provides a viewpoint or a perspective where thoughts and feelings are observed and accepted.
- Tapping into this observing self part of us helps us do all the things we have been learning today. Using this part of us helps us because we learn to look at our thoughts instead of from our thoughts.
- NB: Some of the names people call this place are: Pure awareness: because it is awareness about awareness; the noticing self; the silent self; pure consciousness; transcendent self.
- The main thing we need to take from this is to remember that this part of us is always accessible to us – regardless of thoughts and feelings.

Values and Committed Action

Brief Summary > Revisit Values> Move onto Committed ACTION

- Provide a brief summary of workshop content before revisiting values and moving onto Committed Action.

Example:

*So, let's have a quick re-cap of today so far. We have looked at your struggle, your values and ACT ways of handling difficult thoughts and feelings in a way that have less impact on your life.

*So, now it's time to go back to Your Values and the life you want and start setting from values based goals so you can get this life.

Revisit Values

- Reiterate that it is important to practice identifying the values that underlie goals because there are lots of different ways to fulfil values even when a goal is a long way off.

- Lead to **Values Exercise**

Facilitator Action: Guide participants in values exercise: **Write Yourself a Letter From the Future Workshop Handout p.9**

Adapted from Louise Shepherd

<http://www.contextualpsychology.org/system/files/letter+from+futureACBS.pdf>

Facilitator Action: Exercise Debrief

NB: The facilitator often needs to help participants identify what the underlying values of their content is.

- Lead to **Committed ACTION**

Now we have clarified our values a bit more, now we need to do something with them! We need to put things into Action!

Committed ACTION

- Move participants toward documenting values based actions on the worksheets provided.
- Introduce the worksheets

Examples:

*“So, you’ve made plans and set goals before – but you have not followed through...

*“Now, let’s predict what could go wrong with our well intentioned plan of action. Let’s distil and practice what we have done today.

Here are three worksheets to help:

1. Worksheet: Setting Values-Based Goals **Workshop Handout p.10**

Facilitator Action: Help participants complete this worksheet

Facilitator Action: Debrief with group so as to help by example

2. Worksheet: F.E.A.R to D.A.R.E – Page 1 = F.E.A.R **Workshop Handout p.11**

Facilitator Action: Help participants complete this worksheet

Facilitator Action: Debrief with so as to help by example

These worksheets were adapted from Harris (2009).

3. Worksheet: F.E.A.R to D.A.R.E – Page 2 = D.A.R.E. **Workshop Handout p.12**

Facilitator Action: Help participants complete this worksheet – Hand out ACT TOOL BOX to help them, **Workshop Handout p.13**

Facilitator Action: Debrief with so as to help by example

NB: Include in discussions **Public Commitments**, for example what is the tiniest thing you can do to get started?

These Committed Action activities mark the end of the new skills being taught today.

- Lead to **Conclusion**

ACTing on Weight Conclusion

Conclude

- Provide an ACT summary as per **Workshop Handouts p.14 & p. 15**
- Answer remaining questions
- Provide further resources

Thank

- Participants
- Jason Lillis, Russ Harris, Steven Hayes, Kirk Strosahl and Kelly Wilson

ACT: accept what is out of your personal control, and commit to actions that improve your life despite the presence of normal, yet painful, human experiences.

References

Harris, R. (2009). *ACT made simple*. Oakland: New Harbinger Publications.

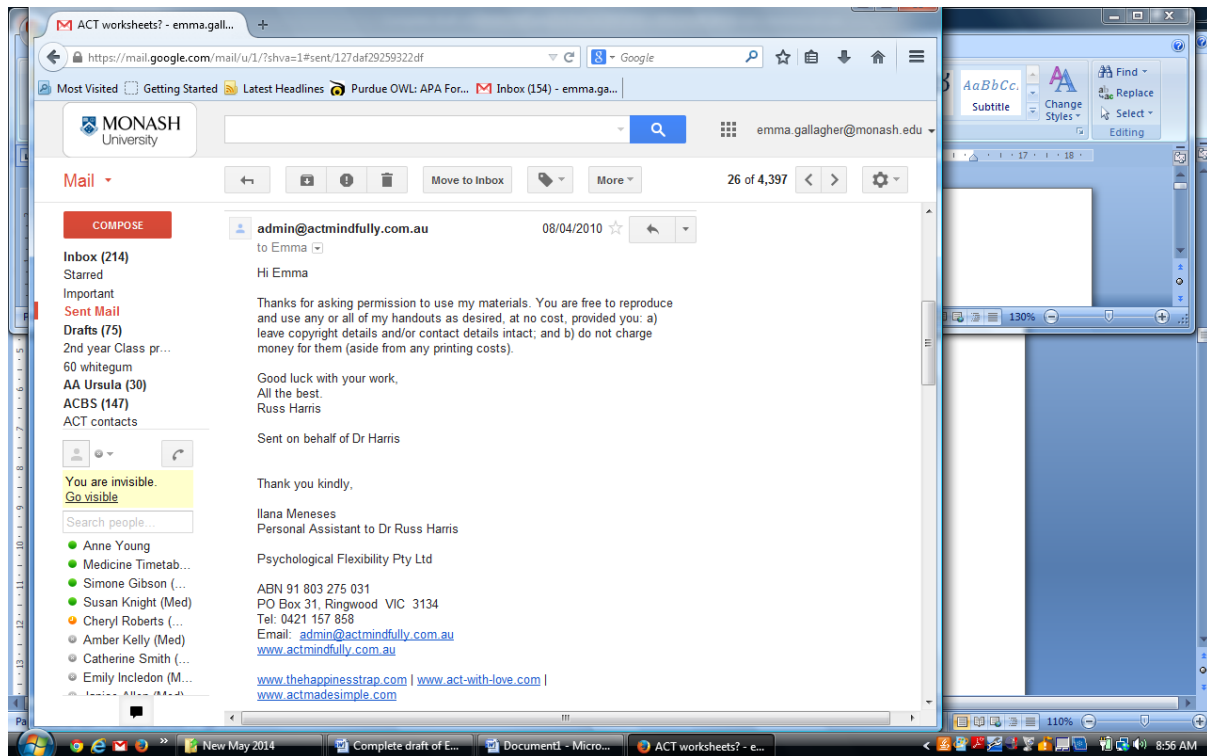
Harris, R. (2007). ACT in a NutShell e-course. ACTMindfully.com.

Hayes, S., Strosahl, K. & Wilson, K. (1999). *Acceptance and Commitment Therapy: An experiential approach to behaviour change*. New York: The Guildford Press.

Hayes, S. & Smith, S. (2005). *Get Out of Your Mind and Into Your Life*. Oakland: New Harbinger Publications.

Appendix R:

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Good luck with your work,

All the best.

Russ Harris

Sent on behalf of Dr Harris

Thank you kindly,

Ilana Meneses

Personal Assistant to Dr Russ Harris

Psychological Flexibility Pty Ltd

ABN 91 803 275 031

PO Box 31, Ringwood VIC 3134

[REDACTED]

[REDACTED]

www.actmindfully.com.au

Appendix S:
Participant Workshop Handouts

ACTing on Weight

Acceptance and Commitment Therapy
for
Emotional Eating & Weight Loss Maintenance

Workshop Handouts

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AIM of ACT

“to help us create a rich, full and meaningful life, while accepting the ‘*pain*’ that life inevitably brings” (Harris, 2009 p. 2)

or

ACT is about you living the life you want even though you will experience difficult things in your life.

In ACT it is believed that having ‘*painful*’ experiences is normal and an inevitable part of human life.

‘*painful*’ experiences are:
uncomfortable
unpleasant
difficult
challenging
and unwanted thoughts and feelings

In ACT it is also believed that even though ‘*pain*’ is normal, that doesn’t mean you need or want to be *struggling* with it.

ACT helps you live the life you want without struggle.

My Struggle or Suffering List

My Emotional Eating & My Weight

List your difficult thoughts, feelings and behaviours related to your emotional eating and your weight.

What thoughts really get you down? What does your mind say when it wants to beat you up?

What feelings do you really wish didn't show up?

Including: worries, fears, self - judgments, self-criticisms, reasons why, reasons why not, images, , fantasies, memories, plans, actions, emotions, body sensations, urges, cravings, impulses...

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Your Current Struggles: What have you got?

Struggles: Challenges & Suffering

Emotional Eating and Weight:

How does this affect your life, what does it stop you doing or being?

You just listed your difficult thoughts and feelings in you struggle list, now think about...

Your Life Draining Actions

What are you doing that makes your life worse in the long run - that keeps you stuck, wastes your time or money, drains your energy, impacts negatively on your health or your relationships or leads to you missing out on life? This includes things you do to get rid of, avoid, suppress, escape or distract yourself from the above thoughts or feelings.

For example, you may Emotionally Eat when you are feeling sad or bored and you want to feel better. It helps for a short while, but in the long run?

Ideas:

Other have listed things like 'rehashing the past, trying to figure out why you're like this, being busy, doing self-development courses, drugs, alcohol, self-help books, therapy, withdrawal from the world, lying in bed, avoiding challenging situations, beating yourself up, blaming your parents, distracting yourself' (Harris, 2009, p. 16).

If Emotional Eating and My Weight were not such a problem for me?

aka The Pain has Gone, Now What?

If _____ weren't such a problem for me, I would _____

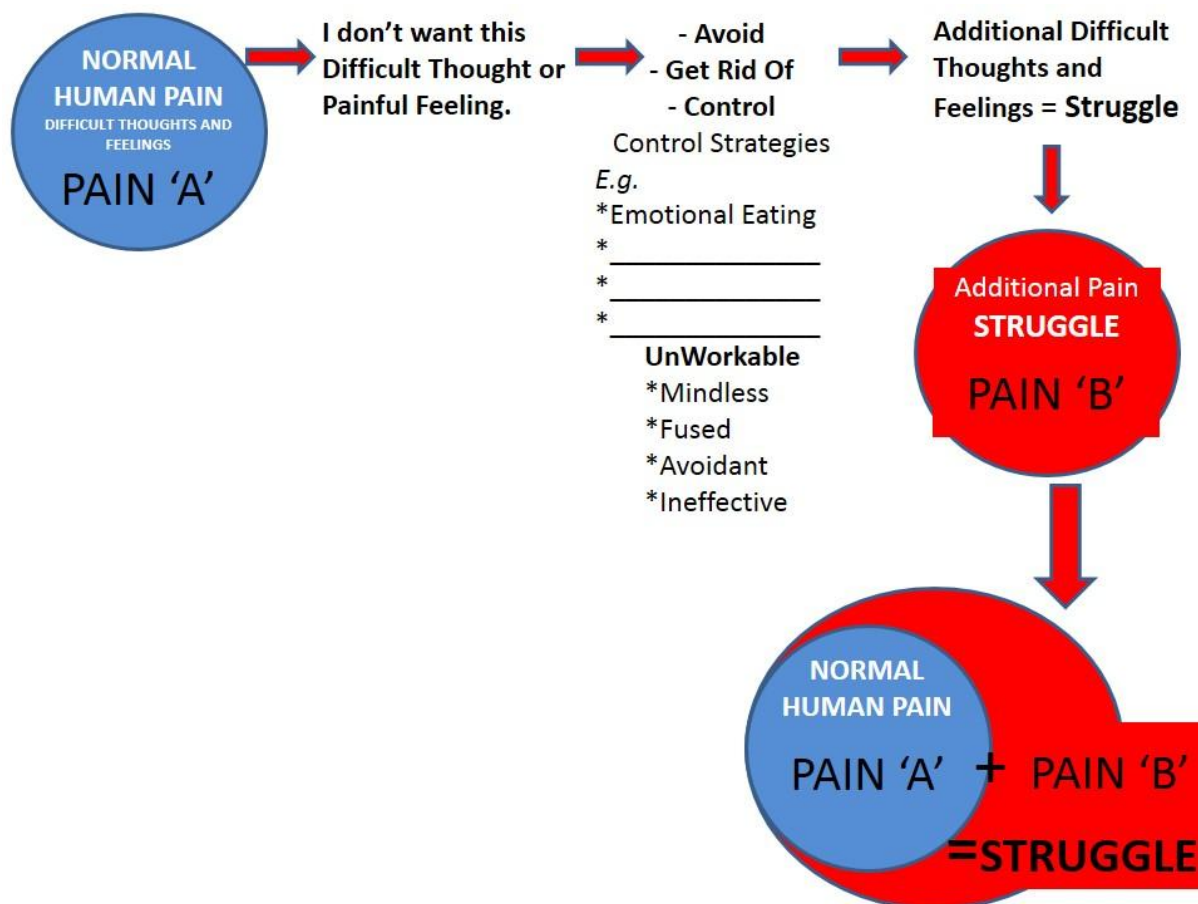
If I didn't have _____ I would _____

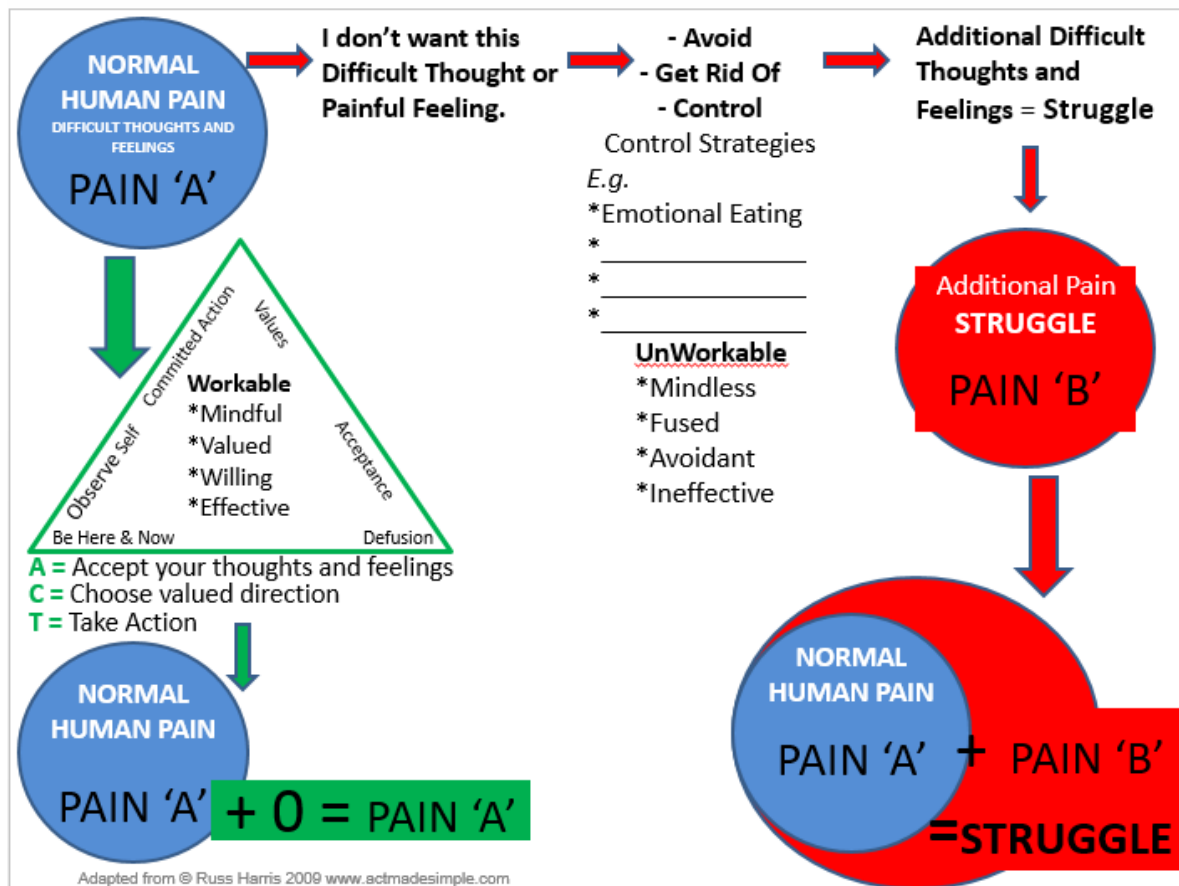
Example: *If fear of rejection weren't such a problem for me, I would have more intimate relationships*

Example: *If I didn't have so much anxiety, I would be able to work harder at my career, and I would try to find the job I always dreamed of having."*

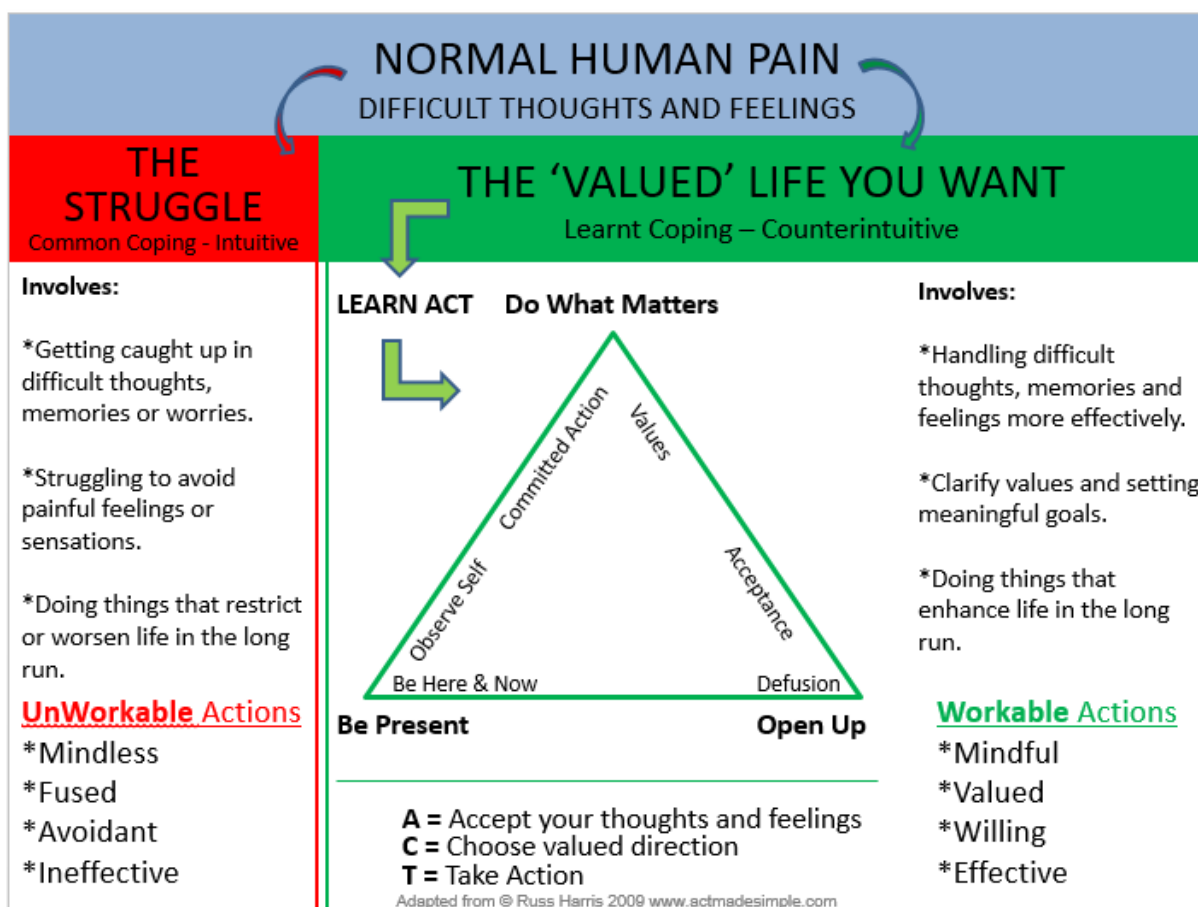
The Life you Want?

Rich, Meaningful & Fulfilling Life = Vitality	Values - What matters to you in the “big picture”? What do you want your life to look like?
	<i>If Emotional Eating and Weight were not such problems for me I could live more in accordance with my values of ...</i> Write a few key words about what is important or meaningful to you in these life domains. What do you want to stand for? What would you start, stop, or do more of or less of? How do you ideally want to behave?
	Mark on a scale of 0-10 how <u>important</u> these values are to you now & how effectively you are <u>currently</u> living by these values. 0=Not important 10=Extremely important 0=Not at all effectively 10=Living by them fully
	Leisure:
	Health:
	Work:
	Community & Environment:
	Spirituality:
	Family Relationships:
	Intimate Relationships:
Social Relationships:	
Parenting:	
Personal Growth:	
Adapted from © Russ Harris 2009 www.actmadesimple.com	





NB: The triangle in this slide is adapted from Russ Harris (2009).



NB: The triangle in this slide is adapted from Russ Harris (2009).

Write yourself a letter from the future

How do I do it?

“Choose a date some months or even years ahead, a date that means something to you – an anniversary or a birthday. Then imagine that life has gone rather well. Things have turned out the way you wanted them to. Write yourself a letter telling yourself about the developments in your life. Try to imagine how your life would feel if you were successful and fulfilled”.

Sample letter

“I’m 45 and life is pretty good! I’m sitting at my desk at home and can’t believe I made it to today. I got through my divorce, and am loving watching my kids grow up. I have landed a great job despite my fears of not being good enough to return to work. My job is great, I love working with people, it is interesting and challenging and the hours are not too long. I am seeing a wonderful man and we spend a lot of time together especially bush walking on the weekends. He is funny and smart and great fun to be around. We both enjoy going out to movies and seeing our friends. I’m feeling fit and I exercise regularly. I am in training for the Mother’s Day Fun Run and I like going to yoga once per week. I’m planning a month’s holiday that I am looking forward to”.

My Letter...

Setting Values-Based Goals

Step 1: My overall goal is to:

Step 2: The values underlying this goal are:

Step 3: When I break-down my goal it looks like this: smaller values based goals:

Immediate Goal – (something small, simple, easy, I can do in the next 24 hours)
e.g. What's the tiniest thing you could do?

Short Term Goals (things I can do over the next few days and weeks)

Medium Term Goal(s) (things I can do over the next few weeks and months)

Long Term Goal(s) (things I can do over the next few months and years)

"When it comes to setting goals, make sure you set a SMART goal. There are different versions of this acronym. In my version, SMART stands for:

Specific: Specify the actions you will take, when and where you will do so, and who or what is involved. Example of a vague or non-specific goal: "I will spend more time with my kids." A specific goal: "I will take the kids to the park on Saturday to play baseball." A non-specific goal: "I will be more loving towards my wife." A specific goal: "I will ring my wife at lunchtime and tell her I love her."

Meaningful: The goal should be personally meaningful to you. If it is genuinely guided by your values, as opposed to following a rigid rule, or trying to please others, or trying to avoid some pain, then it will be meaningful. If it lacks a sense of meaning or purpose, check in and see if it is really guided by your values.

Adaptive: Does the goal help you to take your life forwards in a direction that, as far as you can predict, is likely to improve the quality of that life?

Realistic: The goal should be realistically achievable. Take into account your health, competing demands on your time, financial status, and whether you have the skills to achieve it.

Time-bound: to increase the specificity of your goal, set a day, date and time for it. If this is not possible, set as accurate a time limit as you can" (Harris, 2009, p. 210). Adapted from © Russ Harris 2009 www.actmadesimple.com

From F.E.A.R. to D.A.R.E

You've made plans and set goals before – but you haven't followed through.

What might stop you this time?

The **F.E.A.R.** acronym covers most of the common barriers:

F = Fusion (stuff your mind tells you that gets in the way when you get caught up in it)

E = Excessive goals (your goal is too big, or you lack the skills, time, money, health, or other resources)

A = Avoidance of discomfort (unwillingness to make room for the discomfort this challenge brings)

R = Remoteness from values (losing touch with - or forgetting - what is important or meaningful about this)

So now, in as few words as possible, write down everything that has stopped you following through:

1)

2)

3)

4)

5)

6)

7)

8)

Now go back, and label each answer with one or two of the letters F, E, A, or R – whichever best describe this barrier. In other words, was it:

F = Fusion with a story (e.g. I'll fail; it's too hard; I'll do it later; I'm too weak; I can't do it);

E = Excessive goal (you lack the time, money, health, facilities, skills, or support necessary; or it was just too big and you got overwhelmed);

A = Avoidance of discomfort (you were unwilling to make room for the anxiety, frustration, fear of failure, or other uncomfortable thoughts and feelings);

R = remoteness from your values (you forgot or lost touch with the values underlying this goal)?

The antidote to F.E.A.R. is D.A.R.E.

D = Defusion

A = Acceptance of discomfort

R = Realistic goals

E = Embracing values

Overcoming F.E.A.R.

by using

D.A.R.E

D. Defusion strategies: name the story, thank your mind, acknowledge 'Here's reason-giving' or 'Here's judging', name the demon/monster/passenger, recognize this is Radio Doom & Gloom broadcasting, or simply let the thoughts come and go like passing cars/*leaves on a stream*.

A. Acceptance strategies: name the feeling, observe it like a curious scientist, rate it on a scale of 1 to 10, commit to allowing it, breathe into it, make room for it, give it a shape and colour.

R. Realistic goal-setting: if you lack skills, set new goals around learning them; if your goal is too big, break it down into small chunks; if you lack resources, brainstorm how you can get them; if you lack time, what are you willing to give up in order to make time?; if the goal is truly impossible, e.g. due to health or financial issues, or external barriers over which you have no direct influence, then set a different one.

E. Embracing values: connect with what matters to you about this goal. Is it truly meaningful? Is it aligned with your values? Is it truly important? Is it moving your life forward in the direction you wish to go?

Using these ideas (and others of your own, or of your *trainer* or therapist/coach), write down how you can respond to the barriers you listed above.

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)

Finally, ask yourself this question: am I willing to make room for the difficult thoughts and feelings that show up, without getting caught up in them or struggling with them, and take effective action, in order to do what matters, deep in my heart?

If so: go ahead and give it a go.

If not, consider these three questions:

- Does this really and truly matter to you?
 - If it does, then what is the cost to you of avoiding it or putting it off?
 - Would you rather have the vitality-draining pain of staying stuck, or the life-enhancing pain of moving forward?
- Adapted from © Russ Harris 2009 www.actmadesimple.com.

ACT Tool Box

- COMPASS
- IDENTIFY VALUES
- IF 'X' WERE NOT A PROBLEM FOR ME...
- THE PROBLEM SOLVING MACHINE
- THE MIND AS A 'CHATTER' BOX
- STRUGGLING IN QUICKSAND
- PAIN 'A' vs PAIN 'B'
- DELETE A MEMORY
- DONT THINK ABOUT CHOCOLATE CAKE
- THE POLYGRAPH
- DEMONS ON THE BOAT
- THOUGHTS ON A CARD
- NAME YOUR STORY 'Aha, there's my 'I'm got good enough' story again
- I'M HAVING THE THOUGHT THAT...
- LEAVES ON A STREAM
- BRIAN AT THE DOOR METAPHOR
- THE STRUGGLE SWITCH
- ACCEPTANCE OF EMOTION: THE CURIOUS SCIENTIST; ALLOWING; BREATHE INTO IT
- TAKE TEN BREATHS
- DROPPING ANCHOR
- NOTICE FIVE THINGS
- THE SKY AND THE WEATHER
- MINDFUL EATING

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ACT in SUMMARY



A = Accept your thoughts and feelings
C = Choose valued direction
T = Take Action

Do What Matters = Acting in line with your values; **Valued Action**

Be Present = Be engaged in the here and now of what you are going; **Awareness**

Open Up = Willingness to make space for thoughts and feelings that show up; **Willingness**

Strategies

Defusion: Watch your thinking; allow your thoughts to come and go; create space around your thoughts.

Acceptance: Make room for all feelings and thoughts regardless of pain or pleasantness.

Be Present: Connect with the Here & Now.

Observing Self: Notice that you can Notice; Awareness.

Values: Know what matters to you – what you stand for.

Action: Do what it takes. Goals informed by Values.

Explaining ACT Verbally

ACT helps us by:

- “Teaching us psychological skills to handle painful thoughts and feelings effectively, in such a way that they have much less impact and influence” (Harris, 2009, p. 2). These skills are known as mindfulness skills. These skills help us to reduce the struggle we have with painful thoughts and feelings that are always going to show up in our life because we are human. ACT does not aim to change the content of thoughts and feelings, it aims to help us learn how to have a different relationship with them so we can handle them better.
- ACT helps us clarify our values so we connect with what is really important to us in our life, so we can live the type of life we want. Values provide “knowledge to guide, inspire and motivate us to set goals and take action that enriches life” (Harris, 2009, p. 2). I.e. if you know what type of life you want, choosing life options becomes easier.
- ACT helps us do the above things by teaching people to increase their awareness of their own behaviour, thoughts and feelings.

ACT: accept what is out of your personal control, and commit to actions that improve your life despite the presence of normal, yet painful, human experiences.

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Appendix T: Exploratory Factor Analysis and Discriminate Function Analysis at Time 1

Exploratory Factor Analysis at Time 1 Pre-treatment

Exploratory Factor Analysis was employed with the main standardised variables of interest to uncover sets of items that correlate with one another and may reflect similar underlying constructs or traits that may be able to differentiate individuals' group membership. The 17 variables, as outlined earlier in Table 50, were subjected to a principle components analysis with a varimax rotation. Varimax rotation was used to "maximise the variability of the loading associated with each factor" (Moss, 2008, p. 142).

Table 54 presents the rotation matrix that emerged, together with the eigenvalue, percentage of variance after rotation and Cronbach's alpha associated with the three primary factors extracted. The first factor comprises items that seem to reflect the extent to which individuals emotionally eat, and thus were labelled 'emotional eating'. The second factor comprises items that perhaps reflect the extent to which individuals experience satisfaction with life and psychological flexibility, and thus were labelled 'psychological well-being'. The third factor comprises items that are weight related measurements, and thus were labelled 'weight'. The results suggest that the variables employed to measure specific theoretical domains are in fact measuring the areas they purport to measure and are appropriately related to each other. As can be seen there are some measures that correlate highly on more than one factor; this can be explained as interrelated concepts that each factor measures. There is no one rule to delineate in which factor a variable should reside in this situation, variables need to fit together as well as possible based on the pattern of results.

Table 67

Principle Components Analysis with a Varimax Rotation for Variables at Time 1

	Factor 1 Emotional Eating	Factor 2 Psychological Well-Being	Factor 3 Weight
DEBQEE	.83	.29	.02
ESRE	-.80	-.31	-.10
EESAnF	.83	.10	.02
EESAnx	.80	.06	-.08
EESDep	.66	.11	-.02
SWLS	-.16	-.79	-.06
GHQ12	.01	.71	.05
PA	-.07	-.53	-.01
NA	.27	.71	-.07
AAQII	.35	.75	-.17
AAQW	.59	.60	.04
ORWELL	.49	.60	.22
CFQ28	.46	.64	-.23
NRW	.04	-.05	.98
NRWaist	.00	-.05	.93
NRBMI	-.09	.10	.93
NRH	.23	-.37	.33
Eigenvalue	6.24	2.97	1.87
% of variance after rotation	36.69	14.49	11.02
Cronbach's alpha	.74	.83	.89

Note. Factor loadings > .5 are in boldface. DEBQEE = Emotional Eating subscale of The Dutch Eating Behaviour Questionnaire; ESRE = Emotion and Stress Related Eating Subscale of the Eating and Appraisal Due to Emotions and Stress scale -; EESAnF = Emotional Eating Scale -Anger Frustration subscale; EESAnx = Emotional Eating Scale – Anxiety subscale; EESDep = Emotional Eating Scale – Depression subscale; SWLS = Satisfaction with Life Scale; GHQ12 = General Health Questionnaire 12; PA = Positive Affect; NA = Negative Affect; AAQII = Acceptance and Action Questionnaire II; AAQW = Acceptance and Action Questionnaire -Weight; ORWELL = Obesity related Well-being Questionnaire; CFQ28 = Cognitive Fusion Questionnaire 28 item version; NRW = Nurse report weight; NRH = Nurse report height; NRBMI = Nurse report Body Mass Index; NRWaist = Nurse report waistline.

Discriminate Function Analysis at Time 1 Pre-treatment

A Discriminate Function Analysis was conducted to uncover the dimensions of values that may differentiate the treatment group and the wait-list control group. The values included were the main standardised variables of interest as outlined above in Table 50. One function was extracted and it did not reach significance; Wilks' Lambda = .833 $\chi^2 (17) = 15.23$, $p = .576$. This indicates that there is no group of variables that together are able to differentiate the treatment group from the wait-list control group and thus suggest that the two groups did not differ significantly at Time 1 pre-treatment