Metacognitions, metacognitive processes and metacognitive control strategies in people with obesity and binge eating and people with obesity without binge eating

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Doctorate in Clinical Psychology

University of East Anglia

2013

Word count; 39,854

Abstract

Background

Binge eating is often co-morbid with obesity. There is no widely accepted theoretical model for binge eating, this has treatment implications. Research has highlighted the role of metacognitions in psychopathology, including eating disorders. However, metacognitions in obesity and binge eating have not yet been researched. The self-regulatory executive functioning model (S-REF; Wells & Matthews, 1994, 1996) conceptualises the role of metacognition in the aetiology and maintenance of psychological disturbance. This exploratory study aimed to explore metacognition in people with obesity and binge eating, and people with obesity without binge eating.

Design

A clinical sample of ten participants, five with obesity and binge eating, and five with obesity without binge eating were recruited. A mixed-method design was utilised, with a dominant qualitative component. Participants were interviewed using the Metacognitive Profiling Interview and completed self-report measures to contextualise the results. Using template analysis the two groups were first analysed separately, and then compared to each other.

Results

Three main themes were identified; metacognitive judgements, metacognitive processes and thought control strategies. The binge-eating group reported experiencing greater and more problematic metacognitions, metacognitive processes and thought control strategies than the non binge-eating group.

Conclusions

The results build upon existing metacognitive research, indicating that metacognitions involved in the development and maintenance of binge eating in obesity are often very different from those involved in obesity without binge eating. This suggests the S-REF

model may have relevance for binge eating in obesity. The study supports the idea that individuals with binge eating should be offered specialised treatment that is distinct from the treatment for obese non-binge eaters. Further research is needed to develop an empirically-tested disorder-specific model of binge eating.

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Acknowledgements

Firstly, I wish to thank my thesis supervisors Sian Coker, Gillian Todd and the late Malcolm Adams for their encouragement, expert guidance, suggestions and comments throughout the research process. Their support during this research and its many changes in direction has been invaluable. Special thanks to my colleague and friend Stephanie Ashton, this project would have been much tougher without her. I am also grateful to the staff in the participating services, Addenbrooke's Obesity Clinic and Cambridge Community Obesity/Weight Loss Service, for their help and time in enabling me to complete this research.

Secondly, I would like to thank my family and friends for their unrelenting support during my clinical psychology doctorate training. There are too many to mention, but particularly Pete, my mother and my father. They have all kept me grounded at times of stress and showed their love, encouragement and support. I am not sure how they managed to sustain their kindness to me, but I am incredibly grateful it lasted until the end of the ClinPsyD.

Finally, and most importantly, I would like to thank all the participants who kindly took part in this study, I am grateful to them for giving up their time and speaking so openly and honestly. Without them this thesis would not have been possible.

Chapter One

Introduction

1.1 General Introduction

1.1.1 Aims

This exploratory study in an under-researched area aims to investigate metacognitions and metacognitive processes in people with obesity and binge eating compared to people with obesity without binge eating. More specifically, the research will be based upon the self-regulatory executive function model of emotional disorders (S-REF; Wells and Matthews, 1994, 1996). The current research aims to qualitatively explore the metacognitive experiences of obese people with and without binge-eating, i.e. what are their declarative beliefs about the meaning of their thoughts, their beliefs about, and use of cognitive control strategies, as well as the cognitive processes that are activated when they binge eat. Additional quantitative measures of metacognitive beliefs, judgements, monitoring processes and control strategies included in the research study aim to contextualise the qualitative findings.

It is hoped that the results of this study will lead to increased knowledge of metacognitions in obesity and binge eating. This may lead to further understanding of the development and maintenance of obesity and binge eating, informing disorder-specific metacognitive models and potentially contributing to advancing psychological treatment.

1.1.2 Chapter Overview

This first chapter reviews literature relevant to the current study. Section 1.2 outlines the background and treatment for obesity, the relationship between obesity and psychopathology and the contribution of psychology to the field. Section 1.3 focuses upon binge eating and binge eating disorder (BED). The diagnostic classification of BED, its prevalence and characteristics are explored. The relationship between BED and obesity is discussed and psychological models and treatments of BED examined. Section 1.4 outlines

the concept of metacognitions with particular regards to the S-REF model (Wells and Matthews, 1994, 1996). Research exploring metacognitions, metacognitive control strategies, the S-REF theory and psychopathology is examined. Metacognitive treatment for emotional disorders is outlined. Section 1.5 describes and evaluates research investigating metacognitions and eating behaviour, the applications of these research findings are specifically considered with reference to the S-REF model. Section 1.6 reviews research related to metacognitive thought control strategies (specifically thought suppression, rumination and self-punishment) and eating behaviour. The research is critiqued and its applicability to the S-REF model is discussed. Finally, section 1.7 provides the rationale for the current study and links the concept of metacognitions, metacognitive control strategies, binge eating and obesity in the context of this research. The chapter concludes with the research questions for the current study.

1.1.3 Literature Search Strategies

A systematic computerised search using keyword terms was conducted to identify journal articles and books relevant to this research. The following electronic databases were searched; Science Direct (Elsevier), Web of Science/Web of knowledge, Biomed Central, Cochrane Library, Intute: Health and Life Sciences, PsycINFO, and MEDLINE. All available years were searched. The key search terms and truncated versions were cross-referenced for every combination of eating related words (anorexia, binge, bulimi*, eat*, eating disorder, obesity, overeating, overweight) with metacognitive related words (metacogniti*, cogniti*, thought control strategies, S-REF, thoughts, suppression, ruminat*, avoid*, punish*), and for combinations across all fields (i.e., title, abstract, keywords). Singular and plural terms and American and British spellings were included.

The initial search was supplemented by searching for authors who have published substantially in the topics of interest (e.g. Wells). Further searches using the search terms

above were conducted using Google Scholar. In addition to online databases, the reference sections of the selected articles were checked to identify any further relevant studies and the following journals were hand searched; *Obesity Research, International Journal of Obesity, International Journal of Eating Disorders,* and *European Eating Disorders Review,* alongside some unpublished theses. All available abstracts were reviewed and suitable papers gathered together with those that could not be judged adequately from the information contained in the abstract alone.

1.2 Obesity

1.2.1 Introduction to Section and Overview

In this section, obesity will be defined and an introduction to its prevalence, aetiology and treatment will be presented. The relationship between obesity and psychopathology will be examined. Psychological models of obesity will also be considered.

1.2.2 Definition of Obesity

Obesity is a clinical term used to describe excess body fat (Department of Health [DoH], 2012). Excess body fat accumulates when energy intake is greater than energy expenditure over a prolonged period (National Obesity Observatory, 2010). Obesity is most commonly defined by a Body Mass Index (BMI) of 30 or higher. BMI is calculated by dividing weight (kilograms) by height (metres) squared (BMI=kg/m^2) (DoH, 2012). BMI provides a basis for classifying categories of underweight (BMI<18.5), normal weight (BMI 18.5-24.9), overweight (BMI 25.0-29.9), and obese (BMI≥30.0) (National Institute of Health, 1998). BMI is highly correlated with measures of body fat and is claimed to be a more practical measurement than the gold standard of imaging techniques (Bjorntorp, 2002). However, there are several limitations inherently present in its use. BMI is unable to distinguish between adipose and lean tissue or between different forms of adiposity, and the

relation between BMI and body fatness can be altered by factors such as fitness, ethnic origin and puberty (Prentice & Jebb, 2001).

1.2.3 Prevalence of Obesity

Obesity is currently the most common metabolic disease in the world. The World Health Organisation estimates that more than one billion people are overweight and, of these, 300 million can be considered obese. The latest Health Survey for England (DoH, 2010) data shows that in 2009, 23.0% of adults (aged 16 or over) and 14.4% of children (aged 2-10) were medically obese. The number of people classified as obese is rising rapidly. If current trends continue, the Foresight report (Aylott, Brown, Copeland & Johnson, 2007) estimates that by 2015, 36% of males and 28% of females (aged between 21 and 60) will be obese and by 2025 47% of males and 36% of females will be obese.

Obesity is a chronic health problem; increasing the risk of type-2 diabetes, heart and liver disease, kidney failure, back pain and some forms of cancer e.g. kidney, pancreas, colon and rectum cancers (DoH, 2012). These diseases can ultimately curtail life expectancy and obesity compromises psychosocial functioning and quality of life (Doll, Petersen & Stewart-Brown, 2000). Given the impact on health and functioning, obesity has a significant financial burden, costing the NHS £5.1 billion per year (DoH, 2012), and the wider economy approximately £16 billion per year (DoH, 2012).

1.2.4 Aetiology of Obesity

Obesity results from a long term imbalance between energy intake and energy expenditure, which favours positive energy balance. When energy intake exceeds expenditure, the imbalance causes expansion of adipose tissue lipid storage and favours adipoenesis, an increase in fat cells (Lakka & Bouchard 2007). If energy intake exceeds energy expenditure by 5% each day, this results in a 5-kg weight gain per year and over several years can lead to severe obesity (Jequier, 2002). Hill, Wyatt, Reed and Peters (2003)

showed that weight gain in 90% of the adult US population is attributable to a positive energy balance of only 100 kcal per day or less.

Genetic and environmental factors influence the energy balance. There is evidence that adiposity has a strong genetic component. Adoption studies suggest that an adopted child's BMI is more strongly correlated with the BMI of their biological parents' than their adoptive parents (Selassie & Sinha, 2011). Twin studies show heritability estimates ranging from 50-90%, with the highest concordance rates among monozygotic twins, whether they were reared together or apart (Agras & Mascola, 2005; Maes, Neale & Eaves, 1997; Stunkard, Harris, Pedersen & McCleam, 1990). At present it is not known whether this is due to shared defects in the regulation of energy intake, or differences in metabolic rate (Wilding, 2001).

A few single genes have been associated with obesity (Comuzzie & Allison, 1998). The most common is the melanocortin-4 receptor gene. This gene is present in 4% of obese individuals and acts to suppress food intake, with its subsequent deficiency leading to severe obesity (Eckel, 2003; Farooqi et al., 2000). The leptin gene responsible for the regulation of body weight and adipose stores has also been implicated in obesity (Selassie & Sinha, 2011). Deficiencies of this gene have led to severe obesity in children, while treatment of leptin deficiency caused weight loss (Clement et al., 1998; Montague et al., 1997).

However, obesity will only manifest if the environment is conducive to weight gain. Contributory environmental factors are changes to the quantity or composition of food in the diet and changes in the amount of physical activity undertaken (Crespo et al., 2001; Roberts, Lucas & Hirsch, 2000). The western environment facilitates the development of obesity by providing readily available, inexpensive, energy-dense food, while decreasing the need for prolonged periods of physical activity (Selassie & Sinha, 2011). Experimental studies show

that consumption of high fat food leads to less satiety than less energy dense foods, and encourages overconsumption (Wilding, 2001).

The energy balance equation mandates that for high levels of energy intake, energy expenditure must increase to maintain equilibrium (Blundell, Stubbs, Hughes, Whybrow, & King, 2003). Exercise is important in preventing weight gain and treating obesity. The Government's Chief Medical Officer (CMO) recommends that adults be active at moderate or greater intensity for at least 30 minutes per day, five days a week. The Health Survey for England (The Health and Social Care Information Centre, 2009) measured self-reported physical activity finding that 39% of men and 29% of women aged 16 and over met the CMO's minimum recommendations. Contrastingly, when physical activity was measured objectively, only 6% of men and 4% of women met the recommendations. The percentages of those who met the recommendations decreased with age and were lower among overweight and obese people.

Besides leisure-time physical activity, most of the energy one expends on a daily basis occurs through occupation, transportation and other activities of daily living (Brownson, Boehmer & Luke, 2005; Kruger, 2007). Brownson, Boehmer and Luke (2005) reported that over the past 50 years there has been no difference in the amount of time people set aside for exercise. However, individuals expend less energy in acquiring food, shelter and transportation. There is greater reliance on the car, fewer manual occupations and increasing use of labour saving devices (Wilding, 2001). People also spend longer periods of time sedentary (Kruger, 2007).

It is most likely that the multiple genes that increase susceptibility to obesity interact with environmental factors to produce the pandemic of obesity present today (Bouchard & Perusse, 1993).

1.2.5 Treatments for Obesity

Currently there is no psychological model of obesity (Herpertz, Kielmann, Wolf, Hebebrand & Senf, 2004) so understanding of the disease and treatment is informed by the medical model. The National Institute for Health and Clinical Excellence (NICE) guidelines for obesity (NICE, 2006) recommend that the decision to initiate weight loss and the treatment selected should be based on an assessment of the individual's health needs, together with their BMI, behavioural readiness for weight loss and history of weight loss efforts. Treatment must also be selected with consideration of safety, efficacy and cost.

Individuals with a BMI of 25.0-29.9 kg/m^2 who have two or more risk factors (e.g. high blood pressure and high cholesterol) are encouraged to consume a balanced low calorie diet, increase physical activity and modify inappropriate eating habits. Alternatively, prevention of weight gain is recommended for persons in the same BMI range who are not motivated to reduce their weight or have fewer than two risk factors. As BMI increases, so do the health complications and the need for more intensive intervention. Pharmacotherapy (e.g. Orlistat) is an option for individuals with a BMI $\geq$ 30 kg/m^2 in the presence of co-morbid conditions and who have failed to reduce weight using more conservative methods. Bariatric surgery is reserved for individuals with a BMI of 35-40 kg/m^2 who have significant co-morbid conditions, those with BMI 40-50 kg/m^2 with no other weight related conditions or those with a BMI $\geq$50 kg/m^2 as a first-line treatment (NICE, 2006).

Weight loss programmes include commercial or self-help groups, slimming books and websites. NICE (2006) recommends such options if they are based on a balanced healthy diet, encourage regular physical activity, including behaviour change techniques and focus on long-term lifestyle changes. These methods are safe and low cost, but usually produce minimal weight loss (0.5–1 kg a week) (Womble, Wang & Wadden, 1998). The diet industry is a multi-million pound business and critiques argue that it relies on consumers' failure to

lose weight to make profits, and only 1% of dieters achieve permanent weight loss (Hill, 2004; Nestle, 2003).

Behavioural treatments are based on learning theory (Levy, Finch, Crowell, Talley & Jeffery, 2007), the goal being to help individuals identify unhelpful factors which control their eating and develop strategies to break these habits (Wing, 2002). Strategies include self-monitoring, stimulus control, problem solving, cognitive restructuring, social support, nutrition, education, physical activity and the use of reinforcement contingencies (Brownell, 2000; Wadden & Foster, 2000; Wing, 1998). Behavioural treatment is usually time-limited and goal-orientated, making it easily operationalised and measurable, and its typical group treatment format makes it cost-effective and provides a supportive environment (Wadden & Clark, 2007).

Currently, there are only two licensed pharmacological anti-obesity agents: Sibutramine and Orlistat. These pharmacological treatments can induce weight loss by modifying internal signals that regulate hunger and/or satiety, or by preventing the absorption of fat (Wadden, Berkowitz, Sarwer, Prus-Wisniewski & Steinberg, 2001). Wadden, Berkowitz, Sarwer, Prus-Wisniewski and Steinberg (2001) illustrated that in the first 6 months pharmacological treatments induce mean reductions of approximately 7-10% of initial weight, similar to behavioural treatment. However, at 6 months weight loss plateaus and discontinuation of medication usually results in rapid regaining of lost weight. Medication is successful for achieving weight loss in the short term but maintenance is poor and so should be used alongside behaviour modification (Haslam, 2010). Behaviour therapy or drugs are effective for mild to moderate obesity (Ayyad & Andersen, 2000), but the majority of obese individuals return to baseline weight in the absence of continued intervention (National Health and Medical Research Council, 2003)

Persons with a BMI ≥40kg/m^2 require monitoring from health care providers as they are likely to experience health complications as well as adverse psychosocial consequences. Bariatric surgery patients typically lose 25-35% of their initial body weight 12-18 months post-surgery (Buchwald et al., 2004; Maggard et al., 2005). Weight loss is often accompanied by improvements in mood, with symptoms of depression and anxiety reducing and self-esteem and body image improving, as well as improvements in obesity-related physical comorbidities, including diabetes and cardiovascular disease. (Mitchell & de Zwaan, 2005; Sarwer, Wadden & Fabricatore, 2005). However, 20-30% of individuals fail to achieve typical postoperative weight loss or regain the weight lost within a few years (Sjöström et al., 2004, 2007). Although there are no robust predictors of outcome, preliminary data attributes suboptimal results to the recurrence of binge eating (Kalarchian et al., 2002), problematic dietary intake, disordered eating, low physical activity levels and preoperative psychopathology (Bocchieri, Meana, Fisher, 2002; Herpertz et al., 2004; Sarwer et al., 2005). In addition, bariatric surgery often involves preoperative and late complications (Malinowski, 2006), is expensive (Laiteerapong & Huang, 2010), and not recommended for all obese patients (NICE, 2006).

In light of the limited success of treatment options for obesity and psychological factors associated with poor outcome, it is important to extend the understanding of psychological factors to help inform future treatment of this condition and identify factors associated with outcomes.

1.2.6 Obesity and Psychopathology

There has been considerable debate in the literature addressing the relationship between obesity and emotional disturbance. Some clinical studies indicate high levels of psychopathology, particularly affective disorders and binge eating disorder (BED), in obese individuals compared to non-obese controls (Goldsmith et al., 1992; Hopkinson & Bland,

1982). Community surveys have found associations between obesity and depressive symptoms (Heo, Pietrobelli, Fontaine, Sirey & Faity, 2005; Johnston, Johnston, McLeod & Johnston, 2004), history of depression (Dong, Sanchez & Price, 2004) and psychological distress (Roberts, Strawbridge, Deleger & Kaplan, 2002). Obesity has been associated with compromised quality of life and mental well-being, both when assessed using generic measures (Fontaine, Barofsky & Cheskin, 1997; Fontaine, Cheskin & Barofsky, 1996; Palinkas, Wingard & Barrett-Connor, 1996) and obesity-specific measures (Kolotkin, Head, Hamilton & Tse, 1995; Mathias et al., 1997).

In contrast, other studies have failed to find associations between BMI and psychological disturbances, finding little difference between obese and non-obese individuals (Stunkard & Sobal, 1995). In addition, some studies have found that changes in weight are not associated with changes in psychosocial functioning (Klesges, Klem & Klesges, 1992). The differing results may reflect methodological differences which preclude direct comparison of results, and/or methodological limitations, including inadequate sample sizes, cross-sectional and retrospective designs, the use of non-standardised measures (Bocchieri, Meana & Fisher, 2002; Herpertz et al., 2003) and focus on only a limited range of psychiatric disorders or symptoms when assessing psychopathology (Kalarchian et al., 2002; Mitchell et al., 2001).

It has, however, been indicated that individuals seeking treatment for obesity report more psychopathology than obese individuals in the community (Friedman & Brownell, 1995; Kalarchian et al., 2007). Several explanations for this have been proposed. Those that qualify for weight loss surgery are extremely overweight. Much research has linked severity of obesity with psychopathology, particularly depression (Sullivan et al., 1993; Onyike, Crum, Lee, Lyketsos & Eaton, 2003). Higgs et al. (1997) suggested that individuals seeking medical treatment for obesity are more likely to have a history of depression and anxiety than

those seeking community-based behavioural treatment, even after controlling for BMI. However, Doll, Petersen and Stewart-Brown (2000) found that psychopathology was not associated with obesity severity, although their study was limited by its cross-sectional design which prevents conclusions being drawn with regard to causality and BMI was calculated from self-reports.

Obesity has also been associated with many physical illnesses (Buchwald et al., 2004), and clinical and epidemiological studies have linked physical illness with psychopathology (Dew, 1998). However, studies have suggested that for the individual the primary burden of obesity is physical due to co-morbid health conditions, such as diabetes (Fontaine, Barofsky, & Cheskin, 1997; Stunkard & Sobal, 1995).

This inconclusive research illustrates the importance of examining factors within the obese population which may be associated with emotional disturbance, rather than obesity alone. Several factors have been significantly associated with psychopathology, including obesity severity, education level (Ross, 1994), female gender (Carpenter, Hasin, Allison & Faith, 2000) and binge eating (Yanovski, Nelson, Dubbert & Spitzer, 1993).The majority of research on the psychopathology of obesity focuses on the sub-group of obese individuals who binge eat, particularly those with BED (this will be discussed in detail in Section 1.3 below).

1.2.7 How are obesity and psychopathology linked?

There are several possible hypotheses that may account for the association between obesity and psychopathology (Roberts, Deleger, Strawbridge & Kaplan, 2003). Obesity may increase the risk of psychopathology, psychopathology may increase the risk of obesity, or there may be a reciprocal relation, such that people who are obese are at increased risk of psychopathology and those with psychopathology are at increased risk of obesity. Longitudinal studies support both associations; Goodman and Whitaker (2002) and Hasler

(2004) found that depression predicts the subsequent onset of obesity, whereas Roberts, Deleger, Strawbridge and Kaplan (2003) suggested that obesity predicts the onset of depression. This notion is plausible when considering the stigmatisation of obesity in western culture. Ross (1994) outlined the reflected self-appraisal perspective, which argues that the stigma towards people with obesity may cause them to suffer from lower self-esteem, have more negative self-images, think others dislike them and have higher depression levels. Palinkas, Wingard and Barrett-Connor (1996) noted that obesity might also be associated with depression through differential consumption of nutrients, particularly carbohydrates. Obese people are also less likely to exercise; exercise reduces the risk of depression by increasing endorphin levels, improving fitness and enhancing self-esteem (Barbour, Edenfield, & Blumenthal, 2007; Brosse, Sheets, Lett, & Blumenthal 2002).

There is evidence to suggest both causal and consequential pathways exist between obesity and psychopathology. Given the varying results, further research is required to investigate the link between obesity and psychopathology, as well as possible mediators and moderators of these relationships. Binge eating is one of the most reliable predictors of other types of psychopathology in the obese population (Grilo, White, & Masheb, 2009) and so researchers have called for further investigation into the role of binge eating in obesity; this will be discussed in the following section.

1.3 Binge Eating

1.3.1 Introduction to Section and Overview

This section will first provide a definition of binge eating. Following this the section will focus upon Binge Eating Disorder (BED). The diagnostic classification of BED, its prevalence and characteristics will be explored. The relationship between BED and obesity in terms of psychopathology will be discussed and finally psychological models and treatments of BED will be examined.

1.3.2 Definition of Binge Eating

Binge eating is characterised by eating 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, accompanied by a sense of lack of control over eating during the episode (for example, a feeling that one cannot stop eating or control what or how much one is eating) (American Psychiatric Association [APA], 2012). Binge eating is a primary symptom of the complex psychological conditions, BED and bulimia nervosa (BN).

1.3.3 Binge Eating Disorder

BED is currently a provisional eating disorder category included in Appendix B of the Diagnostic and Statistical Manual of Mental Disorders (4th ed.) (DSM-IV; APA, 1994), but following critical reviews of the literature (Striegel-Moore & Franko, 2008; Wonderlich, Gordon, Mitchell, Crosby, & Engel, 2009) it has been recognised as a distinct and formal diagnostic category in the DSM-V (APA, 2012), which is due for release in May 2013.

Within the DSM-V a diagnosis of BED will require recurrent episodes of binge eating that have occurred at least once/week for 3 months. A BED diagnosis will also require three (or more) of the following; (1) eating much more rapidly than normal; (2) eating until feeling uncomfortably full; (3) eating large amounts of food when not feeling physically hungry; (4) eating alone because of feeling embarrassed by how much one is eating; and (5) feeling disgusted with oneself, depressed, or very guilty after overeating. Furthermore, marked distress is experienced when binge eating is present. Binge eating is not associated with the recurrent use of inappropriate compensatory behaviour and does not occur exclusively during the course BN or Anorexia Nervosa (APA, 2012).

One notable difference between the DSM-IV and the DSM-V diagnosis of BED is the frequency of binge eating episodes. DSM-IV states that discrete episodes of binge eating

needs to have occurred at least 2 days/week over the past 6 months. The 6-month severity criterion had been criticised as too restrictive in comparison to the DSM-IV diagnosis of BN, which requires binge eating episodes at a frequency of at least 2/week for 3 months (APA, 1994). This difference in requirement may be due to the nature of more discrete binges in BN (Latner & Clyne, 2008) but little research informed this criterion and some considered it arbitrary (Bruce & Agras, 1992; Hay & Fairburn, 1998; Shisslak et al., 1995; Striegel-Moore et al., 1998). The broadening of certain diagnostic criteria for binge eating episodes and BED has been welcomed by Latner and Clyne (2008) who note that it might more accurately reflect the research literature and increase the number of individuals eligible for treatment.

The DSM-IV also requires the rapid ingestion of food without hunger, compared to the DSM-V requirements of eating large amounts of food when not feeling physically hungry and eating until feeling uncomfortably full. Fairburn and Cooper (1993) indicated that the amount of food eaten may be an important determinant of whether individuals with BED perceive their eating episodes as binges. It has been consistently demonstrated that individuals with BED consume greater amounts of food in binge episodes than those with BN as well as weight-matched obese individuals without BED who are asked to binge eat (Guss, Kissileff, Devlin, Zimmerli, & Walsh, 2002; Latner & Clyne, 2008; Raymond, Bartholome, Lee, Peterson, & Raatz, 2007). However, evidence suggests that binge eaters may not use a large-size criterion to classify their overeating episodes as binges (Telch & Agras, 1996). Telch Pratt and Niego (1998) found that only 43% of women with BED used this criterion (82% used the loss of control criterion).

Much BED research has not included all DSM-IV criteria, suggesting that there should be an additional "subthreshold" BED group (Wilson, Wilfley, Agras, & Bryson, 2010). However studies that have sought to compare people who meet full syndrome BED criterion with those who meet subthreshold BED (binge eating once a month for 6 months),

have found that the two groups do not differ significantly on measures of weight and shape concern, restraint, psychological distress, and history of seeking treatment for an eating or weight problem (Crow, Agras, Halmi, Mitchell, & Kraemer, 2002; Striegel-Moore et al. 2000).

1.3.4 Prevalence and Characteristics of Binge Eating Disorder

The prevalence of BED is greater than other eating disorders (Spitzer et al., 1993). Gotestam and Agras (1995) reported that among women, BED is five times more common than anorexia nervosa and twice as common as BN. BED prevalence ranges from 0.3-7% in community samples (Grucza, Przybeck & Cloninger, 2007), to 9-30% in obesity clinics (Faravelli et al., 2006), and 9-47% amongst bariatric surgery candidates (Allison, Grilo, Masheb & Stunkard, 2005). These figures suggest that prevalence is positively associated with increased adiposity (Telch, Agras, & Rossiter, 1988).

In general, obese people who binge eat are more likely to have been overweight as a child (Marcus, 1993), have an earlier onset of obesity (Spitzer et al., 1993) and a history of unhealthy weight cycling with typical weight fluctuations of 20 Ib. or more, than non-obese people who binge eat (Hsu et al., 2002; Wilfley & Grilo, 1993). Women are also at greater risk of developing BED (Marcus, 1995), with approximately 4% being affected (Fairburn & Beglin, 1990; Hoek, 1991). Binge eating typically begins in late adolescence or early 20s, on average individuals take ten years to seek treatment (Bruce & Wilfley, 1996). Triggers or precipitants for the development of binge eating in people with BED are predominantly associated with psychological factors such as mood changes or negative feelings, rather than physical hunger (Bruce & Wilfley, 1996).

1.3.5 Obesity and Binge Eating Psychopathology

In a large community-based study utilising rigorous assessment methods, Javaras et al. (2008) reported significantly elevated rates of psychiatric disorders in obese people with

BED relative to those without BED. This has been consistently detected using diverse recruitment, assessment and comparison group methods. Wilfley, Schwartz, Spurrell and Fairburn (2000) studied 162 patients with BED, 77% met criteria for at least one additional lifetime psychiatric disorder; mood (61%), substance-use (33%), and anxiety disorders (29%) were most common. However, psychiatric comorbidity was unrelated to BMI, binge eating frequency, or eating disorder psychopathology. Grilo, White and Masheb (2009) assessed 404 patients with BED using diagnostic and clinical interviews; 74% had at least one additional lifetime psychiatric disorder and 43% had at least one current psychiatric disorder. For lifetime estimates, mood (54.2%), anxiety (37.1%), and substance use (24.8%) disorders were most common. In terms of current comorbidity, mood disorders (26.0%) and anxiety disorders (24.5%) were the most common. These findings are supported by Hudson et al. (2006). Grilo, White and Masheb also suggest that current comorbidity, but not past or lifetime history, is associated with heightened eating-related psychopathology. This highlights the importance of clinicians systematically assessing additional current psychopathology in patients who present for treatment with BED.

Other studies, in contrast however, have found no difference in psychiatric co-morbidity between BED and non-BED (Hsu et al., 2002). These discrepancies could be caused by the heterogeneity of the study populations with regards to their obesity status, by small sample sizes or referral biases.

Obese people with BED have also been shown to have significantly poorer quality of life (Perez & Warren, 2011), lower self-esteem (Johnsen, Gorin, Stone, & le Grange, 2003) and to be deficient in basic coping, problem solving, and interpersonal skills (Marcus, Wing & Hopkins, 1988) compared to those without BED. In addition, some have experienced negative psychosocial consequences such as discrimination (Stunkard & Wadden, 1992).

In summary, previous research highlights high rates of co-occurring psychiatric disorders in BED but has produced mixed findings regarding the relationship of co-morbid conditions to eating-disorder psychopathology. It has not been established whether the distress experienced by those who binge eat is related to the severity of binge eating or the degree of obesity. The mixed findings may also be due in part to limited power and varied assessment methods, including reliance on self-report measures to capture complex eating disorder psychopathology. Overall, the data suggest that the combination of BED and obesity threatens both psychological and physical well-being and effective treatments are needed to target binge eating and weight loss. Furthermore, researchers have called for additional research into the psychological factors of BED within obesity (Stunkard, 2002).

1.3.6 Psychological Models of Binge Eating Disorder

There is no widely accepted model of BED (Cooper, 2005). It has been conceptualised as a distinct disorder, a variant of BN, a behavioural subtype of obesity and as behaviour that reflects psychopathology among the obese (Devlin, Goldfein, & Dobrow, 2003). Several models have been proposed, but these are not without limitations. In particular it has been repeatedly noted that most existing models do not provide a detailed explanation of binge-eating episodes encompassing the potential complex interactions of cognitions, emotions, behaviours and physiology.

1.3.6.1 The dual pathway model.

The dual pathway model (Stice & Agras, 1998) provides a comprehensive framework, combining theoretical accounts of sociocultural, dietary and affect regulation factors. This model was derived for BN pathology but includes determinants that are risk factors for the development of BED. The model consists of two pathways; the restraint pathway and the affect regulation pathway. In the restraint pathway, the model postulates that body dissatisfaction accounts for restraint, which increases the likelihood of binge eating. In the

affect regulation pathway, external events or body dissatisfaction provoke negative affect because appearance becomes a central aspect of negative self-evaluation. Binge eating is used to cope with negative affect by temporarily decreasing or numbing negative emotions, or distracting the individual from aversive emotional states (Arnow, Kenardy & Agras, 1995).

This model has been applied in BN (Stice, Shaw & Nemeroff, 1998) and is supported by research which suggests that binge eating episodes are often precipitated by negative affect (Masheb & Grilo, 2006), and that binge eating appears to be associated with subsequent temporary decrease in negative affect (Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003; Wiser & Telch, 1999). It has also been hypothesised that binge eaters lack emotion-focused coping strategies or skills, rendering them more vulnerable to urges to binge eat (Wiser & Telch). However, it is not clear whether the model is applicable to BED, especially as the role of restraint is unclear (Polivy & Herman 1985).

1.3.6.2 Transdiagnostic theory.

The transdiagnostic theory is concerned with the psychopathological processes that maintain all eating disorders, and therefore includes BED (Fairburn, Cooper, & Shafran, 2003). It arose from observations that eating disorders have common clinical features (including marked low mood intolerance, clinical perfectionism, low self-esteem and interpersonal difficulties) and that patients move between eating disorder diagnostic categories over time (McManus, Shafran, & Cooper, 2010). Treatment based on this approach aims to target this psychopathology, regardless of the diagnostic disorder.

However, very few studies explore the application of this model to BED. Fairburn et al. (2009) evaluated transdiagnostic treatment in a two centre randomised controlled trial. Two forms of the treatment (broad vs. focused) were compared with an 8-week waitlist control condition and 154 patients with an eating disorder. Fairburn et al. illustrated that transdiagnostic treatment can be modified and extended across the range of eating disorders

making it suitable for over 80% of outpatients with eating disorders, although only a low proportion of the sample (4.7%) had BED. It was noted that as transdiagnostic treatment is complex, it may be best reserved for patients with marked additional psychopathology of the type targeted by the treatment.

1.3.6.3 Cognitive behavioural models.

The cognitive behavioural model was originally developed for BN (CB-BN; Fairburn, Cooper, & Cooper, 1986). In this model, low self-esteem gives rise to weight and shape over-concern and negative affect. Weight and shape concerns increase motivation to diet. Binge eating is viewed as a consequence of physiological and cognitive mechanisms related to dieting and an avoidance coping response to negative affect. The detrimental effects of binge eating on mood, self-esteem and compensatory dieting efforts perpetuate the vicious cycle. Adaptations for BED involved considering the impact of being overweight, negative mood as a trigger for binge eating and reducing the role of restraint (Castonguay, Eldredge, & Agras, 1995; Levine & Marcus, 2003).

In accordance with the model, Byrne and McLean (2002) demonstrated that self-esteem, over-concern with weight and shape and dietary restraint accounted for a large proportion of the variance in binge eating and purging, and over-evaluation of shape and weight was central in the maintenance of BN. However, opposing the model, over-concern with weight and shape directly predicted binge eating and while both restraint and negative affect were influenced by shape and weight over-concern they were not significantly associated with binge eating. In overweight adult females, Womble et al. (2001) found that body dissatisfaction predicted dietary restraint which in turn, predicted binge eating. The model has also been explored in a sample of 227 students and 70 patients seeking psychological or surgical treatment for overweight or obesity (Allen, 2009). This study

supported most expected relationships, but the model as a whole was a poor fit to the data and accounted for only a small percentage of the variance in binge eating (7%).

1.3.6.4 Cognitive model of bulimia nervosa.

More recent cognitive models such as the cognitive model of BN (Cooper, Wells, & Todd, 2009) provide a detailed explanation of the development and maintenance of binge-eating episodes, identifying a range of cognitive factors such as positive and negative beliefs about eating, thoughts about having no control over eating and permissive thoughts about eating that are not included in the CB-BN model. This model builds on an earlier model (Cooper, Wells, & Todd, 2004) and is more clearly grounded in Wells' metacognitive theory of psychological disorder (Wells, 2000). The model also draws on schema theories (Beck & Freeman, 1990; Young, 1990) when describing the development of BN. The model proposed by Cooper, Wells and Todd (2009) differentiates different types of beliefs that interact in the development and maintenance of BN and binge eating. The model suggests that negative self-beliefs constitute a vulnerability to BN, although they only lead to disorder when they occur in conjunction with metacognitions that interpret and control cognition and behaviour. In this model, metacognitions include positive and negative beliefs about eating and eating related cognitive processes. Following a trigger, the individual's negative self beliefs are activated and expressed as negative automatic thoughts (NATs). This activation typically creates emotional distress. Bingeing occurs to reduce distress following positive beliefs about eating e.g. 'bingeing will take away my painful feelings'. Negative beliefs about eating based on the perceived consequences of overeating, including concerns related to weight and shape, are also present (e.g., 'eating will make me fat'). Conflict between positive and negative beliefs are resolved by permissive thoughts which includes beliefs/thoughts of having no control over eating during a binge. Bingeing is followed by negative self-appraisals which once again activates a person's NATs. These models suggest that deficits in emotional regulation and

tolerance, alongside factors such as low self-esteem and low self-efficacy may act as triggers for binge eating episodes.

These models are supported by much empirical evidence. Research has found that positive beliefs about eating predict eating disorder symptoms and patients with BN have higher levels of positive and negative beliefs than dieters and non-dieters (Cooper, Todd, Woolrich, Somerville, & Wells, 2006). Evidence indicates that binge eating decreases or provides a distraction from emotional distress, particularly anxiety (Kaye, Gwirtsman, George, Weiss, & Jimerson, 1986) and depression (Hsu, 1990). There is also experimental evidence supporting the notion that patients with eating disorders have information processing biases, particularly selective memory bias (Hunt & Cooper, 2001), interpretive bias (Tchanturia, Serpell, Troop, & Treasure, 2001) and selective attention to eating, shape and weight-related words (Flynn & McNally, 1999). These biases seem to correlate with severity of eating disorder symptoms and improve with treatment (Cooper & Fairburn, 1994). Within metacognitive theory, such biases are considered to be the result of attempts to control cognition. However, these biases have not been consistently detected (e.g. Carter, Bulik, McIntosh, & Joyce, 2000) and some research has found differences between different types of eating disorders (e.g Tchanturia, Morris, Surguladze, & Treasure, 2001). These models derive predominantly from research in BN and so applicability to BED is relatively unknown. Additional research is required to try to conceptualise and understand the mechanisms and nature of BED.

1.3.7 Treatment of Binge Eating and BED in Obesity

Binge eating is distressing and if untreated is associated with weight gain in obese individuals (Dingemans, Bruna, & van Furth, 2002), therefore it is an appropriate target of treatment. However, the lack of an accepted model has treatment implications; there is little consensus around the theoretical underpinnings underlying treatment and the cognitions and

cognitive processes involved in BED are not fully understood. Consequently, treatment is often based on a medical model of obesity which offers little guidance for psychological problems. Since most individuals seeking treatment for BED are obese, weight loss is almost always an additional treatment goal to reduce the associated health risks (Devlin, Goldfein, Liu & Walsh, 2007). However, BED and binge eating are the main predictors of poor weight loss in obesity (de Zwaan et al., 2002; Herpertz, Kielmann, Wolf, Hebebrand, & Senf, 2004). Research has reported that obese individuals with BED lose less weight than comparably obese individuals without BED (Devlin et al., 2005; Grilo, Masheb, Brownell, Wilson, & White, 2007; Munsch et al., 2007), some controlled trials failed to produce any weight loss (Grilo & Masheb, 2005; Porzelius, Houston, Smith, Arfken, & Fisher, 1995) and some suggest weight regain post-treatment (de Zwaan et al., 2005; Nauta, Hos pers, Kok, & Jansen, 2000).

The NICE (2004) guidelines recommend a specifically adapted form of CBT for adults with BED, who usually have obesity, and interpersonal psychotherapy (IPT) and modified dialectical behaviour therapy (DBT) for adults with persistent BED who also usually have obesity.

Research suggests that guided self-help based on cognitive behaviour therapy (CBTgsh) is effective in the short-term for reducing the frequency of binge eating but not obesity (Loeb, Wilson, Gilbert, & Labouvie, 2000; Grilo, Masheb, & Salant, 2005; Munsch et al., 2007). Grilo and Masheb (2005) conducted a randomised controlled study comparing the efficacy of CBTgsh, guided self-help behavioural weight loss (BWLgsh) treatments and a control treatment condition for BED in an overweight population. After 12 weeks, CBTgsh had significantly higher remission rates (46%) than either BWLgsh (18%) or the control condition (13%). Unfortunately, these studies are limited since they only report treatment outcome and short-term (i.e., 3-month) follow-up. BED is known to be unstable over time

(Devlin, Goldfein & Dobrow, 2003) and so short-term treatment effects must be considered with caution.

Wilson, Wilfley, Agras and Bryson (2010) explored the efficacy of BWL, IPT and CBT in the treatment of BED in a sample consisting of overweight and obese participants. This study benefits from a large sample size (N=205) and follow-up (2 years) period. Post-treatment no differences were found in remission from binge eating, reduction in days of binge eating, or no longer meeting DSM-IV criteria for BED (mean: IPT=87%; BWL=81%; and CBTgsh=82%). At the 2-year follow-up, however, both IPT and CBTgsh were significantly more effective than BWL in eliminating binge eating ($P < .05$; odds ratios: BWL vs CBTgsh, 2.3; BWL vs IPT, 2.6; and CBTgsh vs IPT, 1.2). These findings are supported by further research by Devlin, Goldfein, Petkova, Liu and Walsh (2007) who studied overweight and obese participants with BED. They found that the addition of CBT to BWL treatment significantly enhanced outcomes at post-treatment and 24-month follow-up with a 31% decrease in binge eating frequency, but there was no significant change in weight.

DBT has also demonstrated efficacy in an overweight and obese BED population (relative to wait-list controls) with 56% remission rates observed six months after treatment (Telch, Agras, & Linehan, 2001). The DBT model and specific strategies (i.e. training in greater awareness and emotional regulation) appear well-suited to addressing the chaotic eating patterns and high negative affect that characterise some BED patients (Grilo, Masheb, & Wilson, 2001a).

Overall, psychological treatments for BED in overweight and obese populations have been found to be significantly superior to waitlist control groups, however remission rates are modest; BED is responsive to CBT in approximately half of cases (Agras et al., 1995; Marcus, Wing & Fairburn., 1995; Wilfley et al., 1993) and CBT and IPT have consistently failed to produce significant weight loss. There are several potential reasons for their lack of

success; one is that the theoretical models upon which they are based, are underdeveloped. The cognitive behavioural model of BED is largely based on BN, and therefore may not adequately address differences between BED and BN (Masheb & Grilo, 2000, 2002). In particular, the investigation and understanding of the cognitions and cognitive processes involved in the maintenance and development of binge eating and BED is relatively under researched. The degree to which obese individuals with BED are offered specialised treatment that is distinct from the treatment for obese non-binge eaters, the extent to which treatment focuses on binge eating and how treatments designed for BN are adapted for BED populations are all dependent on an increased understanding of BED. Future developments in interventions for BED should first attend to model development rather than relying on modifications of treatments for other disorders that share some similar features.

A greater theoretical understanding of the mechanisms by which psychological therapy operates may provide the basis for more effective treatment. Clinically, these findings suggest that continuing or extending the cognitive model may be most effective. However, cognitive models of emotional disorders have been criticised by Wells (2000) for focusing primarily on the content of cognitions, at the expense of the internal cognitive mechanisms that control, correct, appraise and regulate thinking. Further consideration of additional constructs, such as metacognitions may enhance understanding of the development and maintenance of binge eating and BED.

1.4 Metacognitions

1.4.1 Introduction to Section and Overview

This section outlines the concept of metacognitions with particular regard to the self-regulatory executive function model (S-REF; Wells & Matthews, 1994, 1996). The S-REF is an information processing model of emotional disorders. Emotional responses and psychological disturbance in the S-REF model are considered. Research exploring

metacognitions, the S-REF theory and psychopathology is examined. In particular, attention is focussed on metacognitive control strategies and the relation of these strategies to psychological and behavioural problems. The impact of metacognitive research on treatment for emotional disorders is considered, and the effectiveness of metacognitive treatment for emotional disorders is discussed.

1.4.2 Metacognitions

Metacognition has recently been researched as a basis for understanding and treating a variety of psychological disorders (Wells, 2000; Wells & Matthews, 1994, 1996). Metacognition refers to cognition applied to cognition and may be defined as "stable knowledge or beliefs about one's own cognitive system, and knowledge about factors that affect the functioning of the system; the regulation and awareness of the current state of cognition, and appraisal of the significance of thought and memories" (p. 302; Wells, 1995).

Metacognition is a multifaceted concept (Moses & Baird, 1999). Wells (2000) has identified three types of metacognitions; metacognitive knowledge, metacognitive experiences and metacognitive control strategies. Metacognitive knowledge refers to the beliefs individuals have about their cognitions, such as beliefs about the meaning of thoughts and the efficiency of memory and cognitive control. These can be explicit or implicit. Explicit metacognitive knowledge is conscious and can be verbally expressed; implicit metacognitive knowledge involves plans that guide processing, such as attention allocation, memory and the use of heuristics and biases in forming judgements (Wells, 2000).

Metacognitive experiences involve the conscious interpretations and labelling of cognitive experiences (Wells, 2000), for example appraisals of the meaning of mental events, metacognitive feelings and judgements regarding one's cognitive state. Metacognitive judgements are influenced by momentary feelings, the meanings of which are mediated by self-knowledge (Wells).

Metacognitive control strategies are the responses individuals make to control their cognitive system (Wells, 2000). These can intensify or suppress thinking strategies. Wells and Davies (1994) identified five thought control strategies; reappraisal, punishment, social control, worry and distraction. These are discussed in more detail in section 1.4.7.

1.4.3 Self-Regulatory Executive Function Model

Research on metacognitions in psychopathology is largely based upon the self-regulatory executive function model (S-REF; Wells and Matthews, 1994, 1996). The S-REF model is a transdiagnostic information processing model of emotional disorder. It has demonstrated theoretical and clinical relevance in a range of psychological and emotional disorders, including BN and binge eating (Cooper et al. 2004, 2009), but its investigation in obesity and BED is yet to undertaken. The applicability of the S-REF model suggests that it may be transdiagnostic in nature and therefore may also be relevant in binge eating, obesity and BED, and thus the current research. The S-REF model is linked to self-relevant processing and is activated when there is a discrepancy between the current and the normal or desired state. The S-REF aims to reduce this discrepancy.

Within the S-REF model self-regulatory processing is executed in a limited capacity controlled processing system and so relies on voluntary attention, making it sensitive to attentional resource demands. As illustrated in Figure 1 the S-REF model illustrates a causal interplay between three interacting levels of cognition used in emotion-related processing. The first level consists of automatic and reflexively-driven processing networks. These networks represent various types of information, including stimuli, cognitive states and somatic states. This processing occurs outside of conscious awareness and requires minimal attentional resources. The second level is voluntary processing; voluntary processing is involved in the conscious appraisal of events and the control of action and thought. It is attentionally demanding and dependent on guidance from the third level. The third level

consists of stored knowledge or self-beliefs in the long-term memory. Both the automatic and controlled processing control the contents of consciousness.

S-REF processing is initiated by a threat to one's current state, e.g. an external threat or a threat-related thought. Once activated the S-REF accesses the self-beliefs in the long-term memory, these include a plan for appraising whether the threat is personally significant. Self-knowledge is used as a frame of reference for establishing whether there are discrepancies between the current and desired status. If a discrepancy exists a coping strategy is selected, implemented and monitored. The self-beliefs also have a metacognitive component that guides automatic processing and monitors the effects of processing on higher level beliefs. For example, self-beliefs can direct selective attention and memory retrieval in response to stimuli. The S-REF processing continues until the discrepancy between the current and normal or desired status is resolved.

Figure 1. **The Self-Regulatory Executive Function Model (Wells & Matthews, 1994, 1996).**

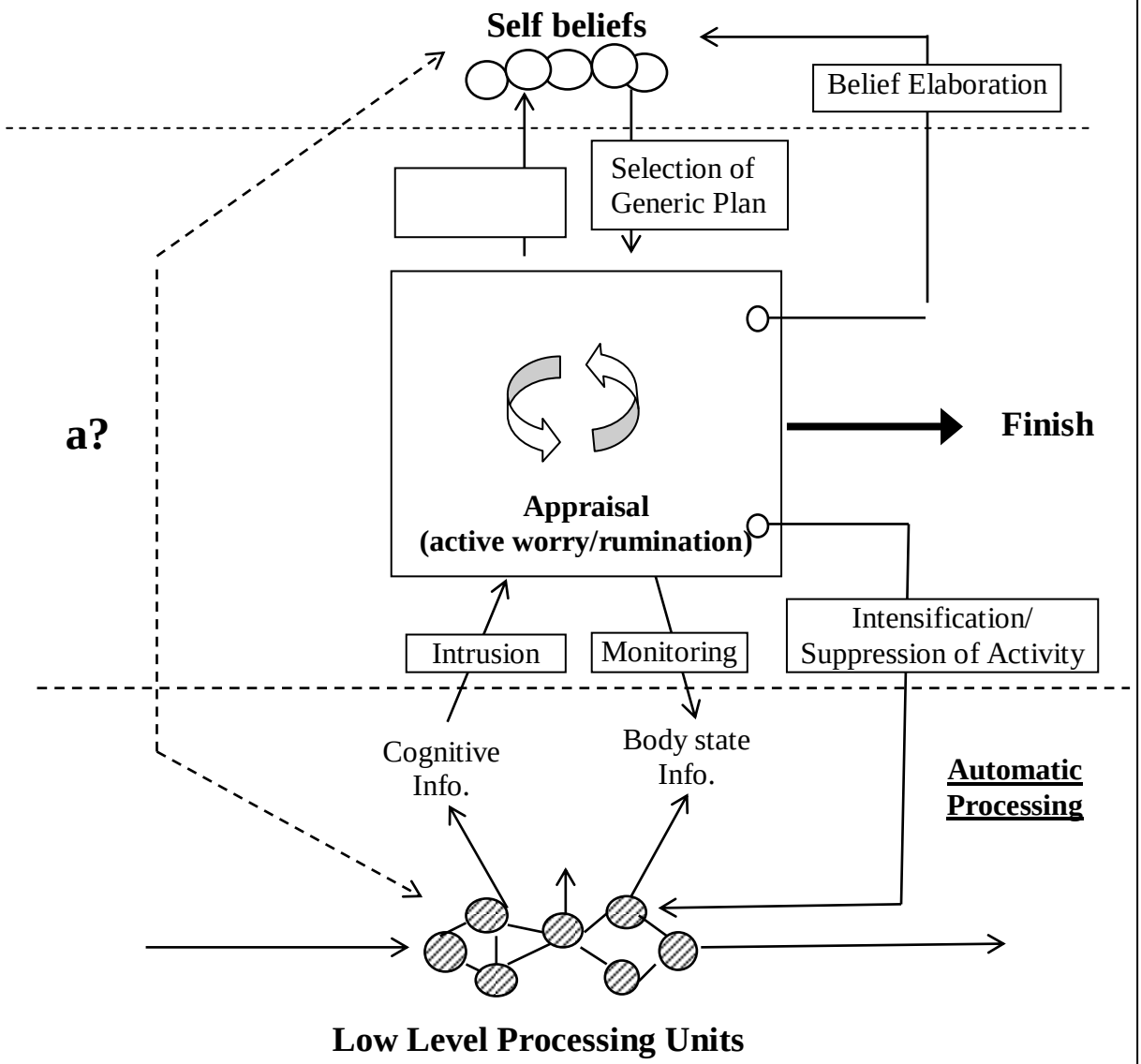

Figure 1. The Wells & Matthews (1994) Self-Regulatory Executive Function (S-REF) Model. From Wells, A. (2000). *Emotional disorders and metacognition: Innovative cognitive therapy*. p.17. Chichester, UK: Wiley. Reprinted with permission of the author.

1.4.4 Emotional Responses in the S-REF Model.

Emotional responses in the S-REF system occur as a consequence of actual or anticipated failure to meet the goals specified by self-regulatory plans, for example depression is associated with an existing failure and anxiety is related to an anticipated failure. Emotion occurs mainly when the S-REF system is active during self-relevant processing. In psychological disorders the person is unable to achieve the self-regulatory goal and so the S-REF system remains activated. The failure to achieve the goal is related to the selection of inappropriate/unhelpful coping strategies that impede control or fail to modify maladaptive knowledge, causing discrepancies to persist. Failure is also related to the repeated negative appraisal of one's current state based on negative self-knowledge, unrealistic goals or external constraints. The S-REF model proposes that psychological disturbance is linked to cognitive attentional syndrome (CAS; Wells, 2000).

1.4.5 Cognitive Attentional Syndrome.

CAS (Wells, 2000) is a processing style which contributes to emotional disorder and relapse. This syndrome consists of heightened self-focused attention and processing of negative self-beliefs. Individuals often engage in repetitive and difficult to control metacognitive thinking strategies such as worry/rumination and threat monitoring. These strategies maintain unhelpful thinking patterns or attempt to control unhelpful thoughts. These processing strategies are problematic; they increase the accessibility of negative information, thoughts and emotions; deplete the attentional resources that are available for processing information that is incompatible with dysfunctional beliefs; lead to performance deficits; and reduce the flexibility and efficiency of the cognitive system to develop more adaptive knowledge (Wells, 2000). Therefore negative thoughts and emotions persist, preventing the restoration of normal functioning.

1.4.6 Metacognitions, the S-REF Theory and Psychopathology

The S-REF model identifies common cognitive processes across a broad range of disorders that are involved in the development and maintenance of psychopathology. According to the S-REF model, maladaptive metacognitive beliefs concerned with the regulation and interpretation of cognition are positively associated with maladaptive coping styles, and therefore vulnerability to, and the maintenance of, emotional disorder. In particular, metacognitive beliefs such as positive and negative beliefs about worry, low cognitive confidence, the need to control thoughts, and cognitive self-consciousness, which is the tendency to monitor one's own cognitive processing, are central in psychological disorders.

Support for the link between metacognitions, the S-REF theory (Wells and Matthews, 1994, 1996), specifically CAS and psychopathology has been demonstrated empirically and theoretically in an array of psychological and behavioural problems, including: anxiety disorders (Wells, 1995), depression (Papageorgiou & Wells, 2003), psychosis (Larøi & Van der Linden, 2005), hypochondriasis (Bouman & Meijer, 1999), nicotine dependence (Nikcˇevic´ & Spada, 2008, 2010), OCD (Wells & Cartwright-Hatton, 2004), pathological worry (Wells & Papageorgiou, 1998), post-traumatic stress disorder (Roussis & Wells, 2006), and predisposition to auditory hallucinations (Morrison, Wells, & Nothard, 2000). This research suggests that the S-REF model is able to offer a transdiagnostic explanation for the development and maintenance of various psychological disorders (Wells, 2009).

1.4.7 Metacognitive Control Strategies, the S-REF Theory and Psychopathology

Metacognitive control strategies are the responses individuals make in controlling their cognitive system (Wells, 2000). One approach to controlling intrusive thoughts is to attempt to suppress them. Wegner, Schneider, Carter and White (1987) pioneered thought suppression research demonstrating that efforts to not think about a particular thought results

in its increased accessibility (Wegner & Erber, 1992) and emotional arousal (Wenzlaff & Wegner, 2000). The S-REF model proposes that suppression activates a monitoring plan that searches for intrusions to test that the suppression goal has been met. However, monitoring increases the likelihood of activating the unwanted thought as the lower level processing units become hypersensitive to intrusive thoughts and symptoms which signal the need for self-regulation and coping (Wegner & Zanakos, 1994; Wenzlaff &Wegner). Therefore suppression can prevent habituation to emotional stimuli and so may be a maladaptive response and risk factor for psychological distress (Folkman & Lazarus, 1980).

Research into thought suppression and psychopathology has reached discrepant conclusions, with the paradoxical effect not being consistently detected (Purdon & Clark, 2000). Despite the inconsistencies, these findings have relevance for understanding psychological disorders characterised by the persistent recurrence of unwanted thoughts and thought suppression is now considered a factor in their development and/or maintenance. However, the techniques used to suppress thoughts are unclear; it is unknown whether single or multiple strategies are used or whether there are individual differences in the use of strategies. It may be that only some thought control strategies are counter-productive.

To measure the techniques individuals use to control unpleasant and unwanted thoughts Wells and Davies (1994) developed the Thought Control Questionnaire (TCQ). Factor analysis yielded five thought control strategies; distraction, re-appraisal of the thought, social control, worry about the thought and self-punishment. The strategies proposed to be protective against psychopathology are reappraisal, distraction and social control (Reynolds & Wells, 1999; Selby, Anestis & Joiner, 2008). These strategies are linked to emotional stability and adaptation (Wells & Davies, 1994). In contrast, self-punishment (Amir, Cashman & Foa, 1997; Reynolds & Wells, 1999) and worry (Nolen-Hoeksema & Morrow, 1991) are associated with CAS and so considered maladaptive.

Self-punishment is a technique used to suppress unwanted thoughts; it may also maintain distress through maintaining the activation of maladaptive beliefs (Wells & Davies, 1994). Using the TCQ, Abramowitz, Whiteside, Kalsy and Tolin (2003) and Moore and Abramowitz (2007) illustrated that punishment is the predominant strategy used by people with OCD compared to anxious and non-anxious controls, who used distraction and social control.

Worry includes rumination as well as intrusive thoughts that are directed toward immediate action. In the S-REF model rumination is conceptualised as repetitive thoughts which are generated in an attempt to cope with self-discrepancy. It is driven by executive (S-REF) processing routines determined by dysfunctional metacognitive knowledge, but operates through automatic processing. Wells and Matthews (1996) propose that information processing strategies characterised by recyclical thinking patterns, i.e. worry and rumination, may interfere with subjective mental control, having several negative effects. Firstly, they deplete the processing resources needed to execute plans which may disconfirm dysfunctional beliefs. Secondly, worry continuously primes dysfunctional self-beliefs and lower level representations of belief-congruent processing units. This reduces the thresholds for intrusion of congruent information in consciousness. Thirdly, active worry may block full access to fear structures, which is necessary for emotional processing (Borkovec & Inz, 1990). Worry may also elaborate memory representations of the stressor (or intrusion) so that it is subsequently activated by a greater range of triggers (Wells & Papageorgiou, 1995).

Wells and Matthews (1994, 1996) suggest that in depression, rumination is initially triggered by attempts to cope with a perceived discrepancy between the actual self and the desired self. Rumination is employed due to metacognitive beliefs about the usefulness of monitoring and controlling thoughts and feelings as a coping strategy, however the

subsequent negative consequences that are experienced lead to negative appraisals of rumination and a downward spiralling of mood. Rafique (2010) conducted semi-structured interviews to explore the experience of depression in Pakistani women. All women reported ruminating; their descriptions were consistent with conceptualisations of rumination as focusing on symptoms, causes, and consequences of symptoms (Nolen-Hoeksema, 1991). Rumination was also found to be predominantly past-focused, repetitive, negative, and self-focused (Papageorgiou & Wells, 1999). As the S-REF model predicts, both positive and negative metacognitive beliefs about rumination were held. Positive beliefs reflected themes of rumination as a coping strategy to gain an understanding of emotions, adapt to changed circumstances and resolve issues. Negative beliefs reflected concerns of rumination as futile, uncontrollable and harmful, and of the interpersonal and social consequences. These findings are consistent with other studies demonstrating significant associations between the presence of positive and negative beliefs about rumination, with increased rumination and depression (Papageorgiou & Wells, 2001a and b; Papageorgiou, Wells & Meina, 2001). Furthermore, Papageorgiou and Wells (2003) suggest that impaired metacognitive efficiency and confidence intensifies negative beliefs about the interpersonal consequences of rumination and positive beliefs about the need to continue to ruminate in order to cope. Hence the continued use of rumination is likely to lead to a range of problems including unachieved goals (Burwell & Shirk, 2007), impaired problem solving (Hong, 2007), impaired concentration (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008) and maladaptive emotion regulation (Burwell & Shirk, 2007). Therefore symptoms will persist (Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003) and the mood disturbance will perpetuate (Nolen-Hoeksema, 2000).

1.4.8 Critique of the Metacognitive Model.

Metacognition is used as an umbrella term encompassing the structures that are related to individuals' thinking processes and information (Leader, 2008). There is no single, agreed upon definition (Brown, 1987) and metacognition as a domain has been criticised for being a fuzzy concept which has diverse meanings (Akturk & Sahin, 2011). Some researchers have called for further theoretical work to be conducted to attain a unified definition of metacognition and its components (Veenman, Van Hout-Walters, & Afflerbach, 2006).

A criticism of the S-REF model is that although it relates to the maintenance of emotional disorders, it does not attempt to address how erroneous metacognitions develop in the first instance (Anthony & Stein, 2009). Whilst this does not limit the development of model based treatment, it does not allow questions concerning the early detection and prevention of emotional disorders in high risk groups to be addressed (Anthony & Stein). This is a weakness of the metacognitive model; the identification of risk factors or early features of psychological or behavioural problems enables early intervention and there is a wealth of established literature which indicates the increased efficacy of early intervention in reducing the severity of emotional disorders (Commonwealth Department of Health and Aged Care, 2000).

Although there is a good level of support for the metacognitive model from a range of sources, at present there is no ideal means for assessing metacognition. Therefore, some of this research needs to be interpreted with caution. Akturk and Sahin (2011) note that the measurement of metacognition is naturally challenging. Lai (2011) identified a number of reasons for such difficulties: (a) metacognition is a complex construct; (b) it is not directly observable; (c) it may be confounded with both verbal ability and working memory capacity; and (d) existing measures tend to be narrow in focus and decontextualised. Schraw (2009),

and Tobias and Everson (2002) have emphasised that there is no single tool that can measure metacognition. Many researchers use a combination of self-report measures, interviews and verbal reports as a means of triangulation and overcoming the weaknesses of each given methodology. Such assessment difficulties can make it difficult to distinguish what is "cognitive" from what is "metacognitive" (Lai, 2011) and the lack of appropriate measures may provide obstacles to the improvement of research and the increasing awareness of metacognition.

However, despite these difficulties metacognition has become an important construct and has formed the basis for several disorder specific “metacognitive” models which are based on concepts originally derived from the S-REF model, for example, generalised anxiety disorder and OCD (Wells & Matthews, 1994; Wells, 1997, 2000).

1.4.9 Metacognitive Interventions

Research into metacognitions and metacognitive control strategies has led to a better understanding of the dysfunctional cognitive mechanisms underlying psychopathology, enabling metacognitive models of specific emotional disorders to be developed. These metacognitive models have informed and advanced treatment, with the development of metacognitive treatment (MCT) manuals (Wells, 2000). According to the metacognitive model, appraisals are the result of maladaptive processing. Therefore MCT focuses on the metacognitive processes which perpetuate the maladaptive processing, i.e. how CAS operates (Wells). Treatment typically focuses on inflexible self-focused attention, worry/rumination, threat monitoring, and the metacognitive beliefs that regulate these processes. MCT has however, been criticised for viewing psychopathology purely in terms of a diagnostic disorder with a systems-based architecture, rather than being person centred and individualised (Hickes, 2012).

Overall much research has linked metacognitions, psychopathology and the S-REF theory (Wells and Matthews, 1994, 1996) both empirically and theoretically. Research indicates that having knowledge of metacognitions can lead to an increased understanding of the initiation and perpetuation of psychological and behavioural problems. This knowledge can aid development of disorder-specific metacognitive models. Such metacognitive models can be applied to inform and advance treatment, maximising the effectiveness of current psychological interventions. Given the relative lack of understanding and treatment success in binge eating and BED, attention to metacognitive processes might be useful both in developing theory and appropriate treatment.

1.5 Metacognition and Eating Disorders

1.5.1 Introduction to Section and Overview

The metacognitive understanding of eating disorders (ED) is less developed than many other disorders (Cooper, 2005; Cooper, Wells & Todd, 2004). This section will describe the relevant research and review its methodological limitations. The research will be considered with specific reference to the S-REF model, with consideration given to its possible transdiagnostic application.

1.5.2 Presence of Metacognitions and Eating Disorders

Using the Metacognitive Profiling Interview (Wells, 2000), Woolrich, Cooper and Turner (2008) explored the presence and content of metacognitions and metacognitive control strategies in relation to thoughts about eating, weight and shape in adult females with anorexia nervosa (AN), dieters and non-dieters. They found group differences in the amount and function of metacognitive activity, although these failed to reach significance at the 0.05 level and so must be viewed tentatively. Data suggest that the AN group engaged in the most metacognitive activity and believed that their thoughts were uncontrollable and abnormal. They were also more likely to attempt to control their thoughts by punishing themselves

mentally, suppressing their thoughts, distracting themselves, attending to others, ruminating and avoiding triggers, rather than using re-appraisal and attending to their body and others. The study by Woolrich, Cooper and Turner excluded participants with ED other than AN, and males were also not included in the research. This reduces generalisability of the findings. Woolrich, Cooper and Turner reported that the AN group had significantly lower BMIs than the dieting and non-dieting group, however, the association between metacognitions and cognitive deficits due to low weight and poor nutrition was not explored. They also lacked a psychiatric control group; which precludes clear conclusions that the findings are specific to the population of interest, i.e. those with AN.

Caselli and Spada (2010) also used the Metacognitive Profiling Interview (Wells, 2000) to explore metacognitions within desire thinking (defined as a voluntary thinking process about a positive target-related experience) in participants (N = 24) with a DSM-IV diagnosis of BN, alcohol abuse, pathological gambling or smoking dependence (N = 6/diagnosis). These disorders were combined as they share similar transdiagnostic features, including the urge/compulsion to obtain a given target, the perception of low control over behaviour, and the recurrence of maladaptive behaviour despite awareness of the negative consequences they engender (DSM-IV, APA, 2000). Caselli and Spada found that all participants endorsed positive and negative metacognitive beliefs about desire thinking; positive metabeliefs concerned its usefulness, and negative metabeliefs concerned its uncontrollability. The goal of desire thinking was to regulate internal states, but none of the participants was able to report when they had achieved this goal. This research is limited by the small number of participants representing each clinical presentation. The sample also consists of individuals seeking treatment, indicating an awareness of their maladaptive behaviour that they are seeking to control. However, Caselli and Spada did reduce potential

confounding effects by excluding those with a co-morbid diagnosis of axis 1 or axis 2 disorders.

The Metacognitive Profiling Interviews (Wells, 2000) used by Caselli and Spada (2010) and Woolrich, Cooper and Turner (2008), were adapted from previous research (Cooper, Todd & Wells, 1998; Turner & Cooper, 2002) allowing the interview to be tailored to the population and domain of interest providing rich, qualitative information. Woolrich, Cooper and Turner demonstrated high inter-rater reliability (Cohen's kappa = .83 and .82). Caselli and Spada did not report this so their findings should be treated with caution, especially as the interview cannot be assessed for construct validity as it was the only measure used. The interview was also conducted retrospectively and so may reflect rationalisations of thinking, rather than actual beliefs and cognitive processes.

Using the Metacognitions Questionnaire-30 (MCQ-30; Wells & Cartwright-Hatton, 2004), Cooper, Grocutt, Deepak and Bailey (2007) investigated the presence of metacognitions in females with AN, dieters and non-dieters. Participants with AN had significantly higher metacognitive concerns indicating higher levels of uncontrollability and danger, cognitive confidence, need for control and cognitive self-consciousness compared to dieters and non-dieters. No difference was found between dieters and non-dieters. Unfortunately this study is limited by the variability in the AN sample which may confound the results. Some participants in the AN group did not meet the DSM-IV low weight criteria so could not be said to meet criteria for AN (Rawal, Park & Williams, 2010; Solem, Hansen, Hagen, Vogel & Fisher, 2011). Participants had also received differing therapeutic interventions, which may have exposed them to the identification and exploration of different cognitive constructs.

Konstantellou and Reynolds (2010) also utilised the MCQ-30 to examine intolerance of uncertainty and metacognitions in relation to problematic (PEA) and non-problematic

eating attitudes (NPEA). PEA was determined by responses on the Eating Attitudes Test (EAT-26, Garner & Garfinkel, 1979). Individuals with PEA scored significantly higher on the total MCQ-30 score, and the subscales measuring uncontrollability and danger, need to control thoughts, intolerance of uncertainty and unlike Cooper et al. (2007), positive beliefs about worry. Konstantellou and Reynolds' large sample (n=116) increases reliability and validity. However the sample was non-clinical and they did not define PEA or report participants' BMI. The sample also consisted of more participants with NPEA (n=89) than PEA (n=27), suggesting the NPEA results are more reliable.

All questionnaires used by the above studies were standardised and displayed good psychometric properties (e.g. Spangler, 2002; Wells & Cartwright-Hatton, 2004; Williamson, Cubic & Gleaves, 1993) suggesting high validity and reliability, and their use also ensures comparability with other pertinent studies. Their self-report nature allows them to be completed quickly and independently, which may reduce the under, or over-reporting of symptoms. However, self-report measures have been criticised as unreliable (Fairburn & Beglin, 1990). Moskowitz (1986) noted that self-reports allow response biases, such as socially desirable responding (Paulhus, 1991), acquiescent responding and extreme responding (Paulhus & Vazire, 2007). Engel et al (2003) found that self-report measures result in considerable under-reporting of disordered eating symptoms. Much research suggests that ED sufferers refuse to acknowledge disordered eating (Andersen, Cohn & Holbrook, 2000; Ogden, 2003), and this may influence their responses on self-report measures. The above studies are also limited by their cross-sectional design, preventing conclusions regarding primacy or causality and with the exception of Konstantellou and Reynolds (2010), the use of small sample sizes.

1.5.3 Theoretical Implications; Metacognition, Eating Disorders and the S-REF Model

The research reviewed above consistently indicates that those with more maladaptive eating attitudes/behaviours engage in more metacognitive activity and have a more maladaptive cognitive style than those without maladaptive eating attitudes/behaviours. These results suggest that increased metacognitive activity and distorted cognitions could be maintained by a maladaptive metacognitive configuration; this is in line with the S-REF theory, building on its transdiagnostic application. These results are also consistent with research into other disorders (e.g. Rafique, 2010) which identify positive and negative metacognitive beliefs as indicated in the cognitive model of BN (Cooper, Wells, & Todd, 2009).

In addition, the notion of commonalities and overlapping features between eating disorders is in accordance with Fairburn's transdiagnostic model (Fairburn, Cooper, & Shafran, 2003). However, there is some debate about whether the core transdiagnostic components are relevant for all eating disorder diagnoses (Lampard, Tasca, Balfour, & Bissada, 2012) and it is poorly understood why some people develop one specific eating disorder over another (Cooper, 2005). This suggests that it may be premature to consider all eating disorders to be transdiagnostic in nature. However, Fairburn’s model primarily refers to the symptoms of eating disorders such as concern about weight and shape; it does not consider the metacognitive processes identified within the S-REF model. None of the above studies explored metacognitions in participants with obesity, binge eating without purging, or BED and so inferences about metacognitions in this population cannot be drawn.

1.6 Metacognitive Thought Control Strategies in Eating Disorders

1.6.1 Introduction to Section and Overview

This section will review research related to maladaptive thought control strategies and eating. This research will be critiqued and its applicability to the S-REF model discussed. First, research related to thought suppression will be examined, followed by self-punishment and then rumination.

1.6.2 Suppression and Eating Disorders

Dingemans, Martijn, Jansen and Furth (2009) explored the relationship between suppression of negative emotions, negative mood and overeating in people with BED. Sixty-six females with full and sub-threshold BED were shown a sadness-eliciting film and asked to either suppress their emotions or react naturally. Following the film participants completed a taste questionnaire whilst eating as much or as little as they liked. Mood scales were completed at 3 time points. Dingemans et al. found no difference in calorie consumption between the two groups (suppression vs. react naturally). Calorie intake in those with no/mild depressive symptoms was unrelated to mood change, but severe depressive symptoms were correlated with higher caloric intake. It was concluded that overeating was used as an attempt to decrease negative emotions. It is however, possible that mood restoration was a natural consequence of time and not attributable to eating.

The experimental methodology by Dingemans et al. (2009), was standardised and monitored to reduce bias, limiting false positives (Sackett, Rosenberg, Grey, Haynes & Richardson, 1996) and compliance checks demonstrated that participants acted in accordance with instructions. Participants were recruited from several centres increasing external validity. However, only female participants were used as research suggests women are more likely to utilise food-thought suppression (Barnes & Tantleff-Dunn, 2010), this limits

findings and the lack of a non-clinical control group prevents comparison. The group also consisted of participants with full and sub-threshold BED. Striegel-Moore, Wilfley, Pike, Dohm and Fairburn, (2000) suggest that women with sub-threshold BED do not differ significantly from those with full-syndrome BED, however, Ricca et al., (2009) found that full-syndrome BED was associated with significantly more emotional eating. The differing severities of BED may have influenced the study findings. Further limitations relate to the laboratory settings which reduce ecological validity. The clinical application is also limited as most individuals do not binge eat outside their homes (Drewnowski, 1997) and the caloric intake in the laboratory was smaller than the amounts usually consumed in objective binge eating episodes (Dingemans, Martijn, van Furth & Jansen, 2009). It is also likely that mood changes following the film were minor compared to those induced by real life events and the instruction to suppress emotions may not reflect a natural tendency to do so.

In another study of thought suppression, Soetens and Braet (2006) adopted an experimental repeated measures design to examine the effects of suppressing food and eating related thoughts on the frequency of such cognitions. Ninety-seven participants (52 obese, 45 normal weight) aged 12-18 years with different levels of dietary restraint were randomly assigned to one of two conditions; suppression or non-suppression. Participants were asked to verbalise their thoughts and press a button when it was related to food or eating. Soetens and Braet found that suppression led to an increased frequency of food-related thoughts in obese high-restrained eaters. This rebound effect was not observed in the other groups.

Soetens and Braet's (2006) repeated measures design requires fewer participants to achieve sufficient power (Weinfurt, 1995). The obese adolescents were attending a weight-loss centre, but had not commenced treatment, this removes treatment effects, ensuring uncontaminated measurement of intrinsic dietary restraint tendencies. Research suggests that those who seek treatment are more psychologically distressed than those who do not (Telch

& Stice, 1998); therefore this specific sample reduces generalisability to a community paediatric obese population.

The random assignment of participants to conditions aims to create homogenous groups, eliminate selection bias and keep confounding variables constant (Crombie, 1996). This can reduce experimental error, help meet assumptions of statistical analysis and keep group sizes similar (Bland, 2000). However, there are a number of limitations in Soetens and Braet's (2006) study. Asking participants to verbalise their thoughts assumes that thoughts occur at the same speed as verbalisations, although thoughts can occur faster (Rassin, 2005). Asking participants to press a button is susceptible to numerous biases; the button might serve as a retrieval cue for the target thought, artificially increasing its frequency (Merckelbach, Muris, Van den Hout & De Jong, 1991) and instructions may lead to hypervigilance. However, this effect can also be expected in the control condition and so may not inflate the paradoxical effects of thought suppression (Rassin). Furthermore it may be hard to distinguish discrete thoughts (Purdon & Clark, 2000). To increase reliability, asking participants the length of time consumed by target thoughts rather than the number has been advocated (Clark, Winton & Thynn, 1993).

Using a cross sectional, correlational design Barnes and Tantleff-Dunn (2010) assessed the relationship between food-thought suppression and weight-related outcomes. A community sample (n = 312) of overweight or obese participants classified as dieters or non-dieters completed self-report measures of thought suppression, weight history and eating behaviours. Females and dieters reported highest food-thought suppression and those with general thought suppression were more likely to endorse food-thought suppression. Barnes and Tantleff-Dunn categorised participants dichotomously by the question "are you dieting currently?" This simplified question provided no information regarding the nature of the diet, its duration or level of restriction. Barnes and Tantleff-Dunn extended research in this area by

using the Food Thought Suppression Inventory (Barnes, Fisak & Tantleff-Dunn, 2010), a domain-specific measure. This may increase understanding of the cognitive processes related to eating psychopathology. Psychometric properties of the measure were not reported, but they found it a valid, reliable, single factor measure, although it is limited by its self-report nature.

1.6.3 Theoretical Implications; Suppression, Eating Disorders and the S-REF Model.

The paradoxical effects of suppression as predicted by the S-REF theory have not been consistently detected by the studies reviewed above. Soetens and Braet (2006) provided partial support, only detecting rebound effects (Wegner, Schneider, Carter, & White, 1987) within the obese high-restrained youngsters, suggesting that only "at-risk" groups may be affected. Barnes and Tantleff-Dunn (2010) suggest that a natural tendency, rather than instructions to suppress food-related thoughts is predictive of ED-related psychopathology, especially within women and dieters. They concluded that the less individuals attempt to suppress thoughts, the less likely they are to experience unwanted thoughts. In accordance with the S-REF model this suggests that thought suppression is a temporary and ineffective strategy, with potentially negative outcomes. These findings are in line with other research which suggests that the suppression of thoughts may lead to their increased accessibility (Dejonckheere, Braet, & Soetens, 2003; Oliver & Huon, 2001). As a result of thought suppression individuals may binge-eat (Ward, Bulik, & Johnston, 1996), seek out food (Johnston, Bulik, & Anstiss, 1999), or increase food intake (Pop, Miclea, & Hancu, 2004). However, Barnes and Tantleff-Dunn's (2010) findings that food thought suppression predicted binge-eating are not consistent with those of Dingemans et al. (2009) who did not find a relationship between suppression and binge-eating. However, Dingemans, Martijn, Jansen and Furth asked participants to suppress negative affect rather than thoughts of food.

Such inconsistent findings are similar to suppression research within other psychological disorders (Purdon & Clark, 2000). Research from other disorders suggests that appraising thought suppression as helpful and achievable will lead to increased efforts to suppress. The potential for individuals' metacognitions to exacerbate the consequences of thought suppression may have specific implications for individuals who rely on thought suppression to control their weight. For example, if individuals find their food-related thoughts unacceptable or believe that thinking about food may increase their likelihood of eating, they are more likely to attempt to suppress such thoughts. Increased efforts to suppress are likely to lead to failed suppression attempts, more intrusions and more severe forms of thought control such as self-punishment and distress, anxiety, or depression (Purdon, 1999). The resulting distress is likely to maintain this cycle by draining cognitive resources and further impairing suppression efforts (Purdon & Clark, 2000).

Consequently, researchers have stressed the importance of examining the relationship between eating behaviours and thought control strategies (Polivy, 1998; Ward, Bulik, & Johnston, 1996; Wenzlaff & Wegner, 2000). In other psychological disorders it has been hypothesised that punishment, rumination and worry are metacognitive control strategies used to control and suppress thoughts.

1.6.4 Self-punishment and Eating Disorders

Very little research has explored self-punishment as a metacognitive control strategy within eating disorders or obesity. Woolrich, Cooper and Turner (2008) found that participants with AN were significantly more likely to punish themselves mentally than dieters and non-dieters. They noted that a significant proportion of participants with AN deliberately used cognitive processes to make themselves feel worse and that this corresponds with the observation that one function of disordered eating is self-punishment. They related this to the "self-verification" theory (Swann Jr., Wenzlaff, & Tafarodi, 1992) which suggests

that humans have an instinct to confirm their self-beliefs to create predictability, certainty and a consistent identity. In other emotional disorders and the S-REF model, self-punishment is hypothesised as leading to the persistence and strengthening of emotional responses and contributing to CAS and therefore emotional disorder. It merits further investigation in relation to binge eating, BED and obesity.

1.6.5 Rumination and Eating Disorders

It is possible that thought suppression and rumination may be related. An individual may use suppression to stop ruminating, but in doing so ruminate more, causing negative thoughts and emotions to persist, as classified by CAS (Wells, 2000).

Rawal, Park and Williams, (2010) conducted two cross-sectional studies. Study one measured levels of rumination, beliefs about rumination, experiential avoidance and aspects of schematic thinking in a student population (N = 177). Study two extended the first study to a clinical sample of people with AN (N = 13) and a control group (N = 13) matched for age, gender and verbal IQ. Self-report measures assessed ED psychopathology (the Eating Disorders Examination-Questionnaire (EDE-Q), Fairburn & Beglin, 1994), anxiety, depression and rumination. Participants also completed an Eating Disorder-Sentence Completion Task (ED-SCT) specifically adapted to reflect ED-related schematic thinking (Cooper, et al, 1997). The ED-SCT requires participants to generate their own responses to a sentence-stem which is scored as being positive or not. Rawal, Park and Williams found that ED psychopathology significantly correlated with higher rumination, beliefs about rumination benefits, experiential avoidance and positive ED-SCT. In a follow-up 10 months later, change on the EDE-Q was positively correlated with change in rumination ($r = .59$, $p = .04$), but this was not significant when controlling for change in depression. Rumination may be associated with depression, which was significantly higher in the clinical sample. Furthermore the clinical sample was small, only female and not representative of the range of

ED psychopathology. The authors do not provide information regarding treatment status, but ED diagnoses were verified using EDE-Q. The EDE-Q has good internal consistency, good inter-rater reliability and is able to discriminate between eating disordered individuals and controls (Fairburn & Cooper, 1993; Williamson, Anderson, Jackman, & Jackson, 1995). Using the ED-SCT is a welcome addition to research in this area as it requires participants to generate their own responses and so may be more indicative of unique schematic content than standardised measures. It was assessed by two independent raters; inter-rater agreement was high, with an overall agreement of 98% between raters and a kappa value of.97. The confounding effects of anxiety and depression were also controlled for.

Sassaroli et al. (2005) investigated the relationship between worry and eating disorder symptoms in a clinical sample (N = 34 with AN, N = 29 with BN) and student control group (N = 30). Eating disorder symptoms were measured by the Structured Clinical Interview for DSM Disorders, (SCID; First, Gibbon, Spitzer, Williams, & Benjamin, 1997) and the Eating Disorder Inventory (EDI; Garner & Olmsted, 1984), higher levels of worry, as assessed by the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990) were significantly associated with eating disorder symptoms, except for the EDI subscale bulimia. The presence of eating disorder symptoms within the control group was not assessed, and anxiety and depression levels were not controlled so co-morbidity may account for some variation, yet the nature and magnitude of this was not explored.

Nolen-Hoeksema, Stice, Wade and Bohon, (2007) utilised a longitudinal design in which surveys and diagnostic interviews examined the reciprocal relations between rumination and symptoms of BN, depression and substance abuse over five years. The community sample consisted of 496 females, aged 11-15 years at baseline. They found that elevated ruminative coping at baseline predicted future increases in bulimic and substance

abuse symptoms, and the onset of major depression and binge eating. Depressive, bulimic and externalising symptoms predicted increased rumination.

1.6.6 Theoretical Implications; Rumination, Eating Disorders and the S-REF Model

This research supports the S-REF prediction that perseverative forms of negative processing, namely worry and rumination, can bias cognitive processes and affect self-regulation. The studies suggest that some ED symptoms are characterised by rumination and worry, although Sassaroli et al., (2005) found that "bulimia" when measured by the EDI (Garner, Olmsted, & Polivy, 1983) was not related to worry but this may reflect measurement issues. Information processing strategies characterised by rumination have been associated with the persistence of symptoms, unachieved goals and maladaptive emotion regulation, as indicated in depression by Burwell and Shirk (2007). Rawal, Park and Williams, (2010) found that participants with AN endorsed more positive beliefs about rumination than controls. The belief that rumination is an effective and desirable coping strategy is an important factor contributing to the maintenance of S-REF activity (Wells, 2000). Nolen-Hoeksema et al. (2007) results suggest that rumination prospectively predicts increases in bulimic symptoms and that bulimic symptoms predict increases in rumination. This represents a novel contribution to the literature, suggesting dynamic pathways by which a ruminative response style might develop. This is again in line with the S-REF model hypothesis that clinical disorders are associated with dynamic disturbances that fail to modify maladaptive beliefs (Wells & Matthews, 1994, 1996). However, to the author's knowledge, this research has not been extended to obesity, BE and BED populations so the relationship between ruminative thought control strategies, obesity and binge eating is unknown.

1.7 The Current Study

1.7.1 Introduction to Section and Overview

This section will aim to summarise and integrate the pertinent aspects of Chapter 1, to provide a background to and context for the current study. The section concludes with the aims of the study and the specific research questions posed.

1.7.2 How are Metacognitions, Metacognitive Control Strategies, Binge Eating and Obesity Related?

As outlined in section 1.3, BED is a complex psychological condition which is often co-morbid with obesity. Higher levels of general psychopathology have been found in obese people who binge eat and have BED compared to obese people who do not. Therefore, the combination of binge eating and obesity affects both the psychological and physical well-being of this population and effective treatments are needed to target binge eating and weight loss.

Obesity is classified as a physical condition and so current treatment recommendations focus on achieving weight loss and do not aim to change the cognitions or behaviours present in binge eating and BED. NICE guidelines do not provide distinctions in treatment between obese and non-obese people with BED and many published reviews have not focussed specifically on studies investigating BED in obese populations (e.g. Brownley et al., 2007). Psychological treatments designed for BN have been adapted for the BED population (Levine & Marcus, 2003), and there is some evidence that CBT interventions reduce binge eating in overweight/obese populations in approximately half of cases but weight loss is minimal (Agras et al., 1995), leaving scope for improvement in understanding and treatment outcome.

There is currently no widely accepted theoretical model for BED and the cognitions and cognitive processes involved in the disorder are not fully understood. Metacognition has

recently become an important construct in theories of psychopathology (Cooper, Grocutt, Deepak & Bailey, 2007). Support for the link between metacognitions, psychopathology and the S-REF theory (Wells & Matthews, 1994, 1996) has been demonstrated empirically and theoretically in an array of psychological and behavioural problems. This suggests that the S-REF theory may have transdiagnostic relevance (Wells, 2009), having identified common cognitive processes that are involved in the development and maintenance of psychopathology across a broad range of disorders.

Research exploring metacognitive activity and eating disorders (e.g. BN and AN) has shown that individuals with more maladaptive eating engage in more metacognitive activity and have a more maladaptive cognitive style (i.e. engage in more unhelpful cognitive control strategies; rumination and self-punishment) than those without maladaptive eating. This research has built upon the transdiagnostic application of the S-REF model. Although metacognitive theory has been applied clinically to binge eating (Cooper et al., 2009), the presence of metacognitions in participants with obesity, binge eating without purging, or BED has not yet been studied and research exploring metacognitive control strategies within this population is limited. Consequently, inferences about this population cannot be drawn and the extent to which the S-REF metacognitive model can be applied to binge eating without purging and BED is unknown. Therefore, an exploratory study of metacognitions and metacognitive control strategies would be a useful progression for metacognitive research and model development.

The role of metacognition in obesity, binge eating and BED is worthy of investigation for two reasons. Firstly, binge eating has been conceptualised as a strategy for regulating negative cognition and affect, and as such it represents, at least in part, a metacognitive control strategy. Secondly, anxiety and depression are associated with obesity, binge eating and BED, and according to the S-REF model emotional disturbance is linked to maladaption

in metacognitions. Therefore metacognitive factors may contribute to obesity, binge eating and BED directly, or they may contribute indirectly via emotional disturbance.

1.7.3 Contribution of the Current Project

The current research seeks to explore the relationships between metacognitions, binge eating and obesity, gaining rich, in-depth data to examine whether the S-REF model can be usefully applied. Research indicates that becoming aware of metacognitions can lead to an increased understanding of the development and maintenance of psychological and behavioural problems. Given the relative lack of understanding and treatment success in binge eating and BED, further consideration of metacognitive processes would appear to be appropriate. As the S-REF processing configuration is predicted to be responsible for maintaining emotional disorder, an understanding of the mechanisms by which metacognitive activity and control strategies are linked to the maintenance of binge eating and BED would be useful. A greater understanding of metacognitions may allow the development of a disorder-specific theoretical framework which may offer theory-driven predictions for intervention.

1.7.4 Research Aims

This study aims to investigate the metacognitive experiences of people with obesity and binge eating, and people with obesity without binge eating. Due to the novel, exploratory nature of this research, a qualitative, methodology will be employed. This research is particularly interested in gaining a rich, in-depth insight into whether there are similarities and differences in the content of metacognitive knowledge, processes, and the use, function and success of metacognitive control strategies with particular relation to the S-REF model in obese people who report binge eating and those that do not.

1.7.5 Research Questions

1) What are the metacognitive knowledge, processes and control strategies experienced by participants with obesity and binge eating in relation to thoughts about eating?

2) What are the metacognitive knowledge, processes and control strategies experienced by participants with obesity without binge eating in relation to thoughts about eating?

3) What are the similarities and differences between the metacognitive knowledge, processes and control strategies experienced by participants with obesity with and without binge eating in relation to thoughts about eating?

The above research questions will be examined with specific reference to the S-REF model (Wells & Matthews, 1994, 1996), and its possible transdiagnostic relevance.

Chapter Two

Methodology

2.1 Summary

In this chapter the research methodology will be presented, beginning with the study design and rationale. The ontological and epistemological position, as well as the researcher's personal position is made explicit. Details of the participants, including the sampling method, inclusion and exclusion criteria are noted. The qualitative interview schedule and the rationale for its use in the current study are described. The quantitative measures, their psychometric properties and the rationale are also presented in detail. The procedure is provided, with a consideration of ethics. The plan of analysis is then noted, and the chapter concludes with an evaluation of the methodological and reflexive rigour of this research.

2.2 Initial Study Design

It was initially planned for this research to be predominantly quantitative with a large sample size (N = 128), and be supplemented by a detailed qualitative study of a smaller sample (N = 10). This design aimed to serve the dual purposes of generalisation between comparable research studies and in-depth understanding of a novel research area. Unfortunately, this research encountered a number of severe difficulties during the recruitment phase (as described in Appendix A) and so the design was modified as reported.

2.3 Current Study Design and Rationale

A multi-method, cross-sectional design was adopted integrating a dominant qualitative approach and a quantitative approach with 10 participants. Mixed methods research recognises that both quantitative and qualitative research methods are important and useful (Johnson & Onwuegbuzie, 2004) and enable research to have multiple purposes, e.g., both to explore and to describe issues (Neuman, 2000). Though mixed methods designs can pose challenges for a researcher, such as the need to be familiar with both qualitative and

quantitative research methods, the use of both can provide tremendous insight when investigating complex under-researched areas (O'Bryan & Hegelheimer, 2006), such as metacognitive beliefs, metacognitive processes and eating.

This research primarily relied on qualitative data in the form of semi-structured interviews to meet the research aims of generating rich, exploratory data about participants' metacognitive experiences in relation to thoughts about eating. Semi-structured interviews are optimal for collecting data on individuals' personal histories, perspectives, and experiences, particularly when such sensitive topics are being explored (Creswell, 2003). Template analysis (King, 2004) was used to organise the interview transcripts in relation to the S-REF model. Template analysis was appropriate as it enables new data to be analysed according to a pre-existing theoretical framework, providing new descriptions of previously known phenomena (King). Quantitative self-report questionnaire data were used to contextualise the qualitative findings and enable them to be compared to other research studies investigating metacognitions, the S-REF Theory and psychopathology, as well as enabling triangulation.

Recruitment and data collection were conducted collaboratively with another Trainee Clinical Psychologist at the University of East Anglia (UEA). Both researchers contributed equally to recruitment and data collection, and analysed the results independently according to their individual research questions.

2.4 Ontological and Epistemological Position

Ontology is concerned with the nature of reality. The ontological position of a piece of research relates to "what it is possible to know about the world" (Ritchie & Lewis, 2003, p. 19). Blaikie (1993) describes ontology as encompassing claims about what exists, what it looks like, what units make it up and how these units interact with each other. Ontology describes our view (whether claims or assumptions) on the nature of reality, and specifically,

whether it is an objective reality that really exists, or a subjective reality. The consideration of ontology is fundamental (Delbridge, 2006), without which the researcher may be blinded to certain aspects of the research or phenomena, as they may be implicitly assumed or taken for granted and therefore not opened to question, consideration or discussion (Flowers, 2009). It is important to make one's ontological position clear for the purposes of transparency (Yardley, 2000).

Closely coupled with ontology and its consideration of what constitutes reality, epistemology refers to theories of knowledge, how we come to know the world and our ideas about the nature of evidence and knowledge (Barbour, 2008). Epistemology considers what knowledge is, what are the sources and limits of knowledge (Eriksson & Kovalainen, 2008) and the need to reflect on the most appropriate methods to produce reliable and verifiable knowledge (Chia, 2002; Easterby-Smith, Thorpe and Jackson, 2008). Hatch and Cunliffe (2006) highlight the inter-dependent relationship between epistemology and ontology, and how one both informs, and depends upon, the other. In considering this link, the need to understand the researcher's position becomes apparent.

This ontological and epistemological approach adopted by this study was one of a critical realist perspective. Critical realism is a philosophical view of knowledge. In this respect the researcher believes that it is possible to acquire knowledge about the external world and that there is a reality, but it is multifaceted and complex. This perspective claims that individuals have their own assumptions, culture and experiences which influence perceptions of the world (Madill, Jordan & Shirley, 2000). Therefore, investigation can only measure psychological phenomena through an interpretative lens. Both participants and researchers approach the research with a lens which is shaped by their prior experiences. The lens determines how information is received, processed and understood. Due to the individual nature of lenses, different interpretations of relevant research issues are possible. A critical

realist approach is also complementary to this research as it lends itself well to a cross-sectional design adopting a mixed methodology (Mingers, 2004).

2.5 Researcher's Position

I am a 28 year old, white British female who is in her final year training on a Clinical Psychology programme. Eating behaviour has been a long-standing interest of mine and initially influenced my career choice into Clinical Psychology, particularly my first Assistant Psychologist post which was in the field of eating disorders, focusing mainly upon AN. I am especially interested in the different functions food can provide for individuals, and how it can be used and misused with so much power. However, being of a healthy BMI I have no personal experience of obesity, or the cognitive, emotional, physical and social causes and consequences. As a result, my knowledge and experience is purely professional with an academic and theoretical basis; I have little "real-life" insight. I am aware of the health risks and stigmas associated with obesity as portrayed in the media, but have no preconceived ideas about the psychological causes, consequences or maintaining factors, although I am very interested in health beliefs and health psychology.

As a Clinical Psychologist in training, I have an interest in the effectiveness of therapeutic interventions and have experience considering metacognitions and beliefs when working therapeutically. I believe that it is vital to have a theoretical understanding of psychological conditions and behaviours, to enable evidence-based interventions to be successfully implemented. I therefore feel this research is worthwhile but have no strong feelings about the findings.

This position and my review of the literature influenced my initial thoughts about what I expected to arise from the data. I expected that obese people with binge eating would report a greater number of metacognitive beliefs, judgements and monitoring tendencies that are consistent with the S-REF model than obese people without binge eating. I also expected

that obese people with binge eating would report using more metacognitive control strategies that have been associated with psychopathology, particularly rumination and punishment, than obese people without binge eating. Consequently, I thought that the interviews with those that binge eat might be both personal and emotive. I thought that some topics might be sensitive and participants may not wish to divulge much information. I was however, hopeful that my Clinical Psychology Doctoral training would place me in a good position to contain some of the heightened emotions that participants may experience, and enable them to feel at ease. I thought that obese people without binge eating would report using more metacognitive control strategies theorised to be protective against psychopathology, i.e. distraction, social control and reappraisal, and so the interviews would be less emotionally salient.

However, my clinical training has led me to believe that all formulations are unique to the individual and for this reason I entered the research believing that this may not be necessarily be the case for all participants. I therefore think that the lens which I entered the interviewing and analysis process was open to finding similarities and differences between individuals. I had no preconceived, important ideas to prove or disprove, and had no connections to the founders of the S-REF model or any researchers in this field, rather I was open to what might emerge from the data. I also value the utility of both quantitative and qualitative research and my research interests are driven by pragmatic aims.

2.6 Participants

A clinical sample was used, comprising participants who are medically classified as obese. Previous research has indicted that obese patients seeking medical treatment for their obesity are more likely to report binge eating, meet criteria for BED and report greater degrees of psychopathology, than obese people in the community (Allison, Grilo, Masheb & Stunkard, 2005). Therefore, participants were recruited from two specialist weight management services: Addenbrookes Hospital, Cambridge University Hospitals NHS

Foundation Trust, and the Weight Management Service, Cambridgeshire Community Services NHS Trust.

2.6.1 Inclusion and Exclusion Criteria

2.6.1.1 Inclusion criteria.

1. Any new patient who was referred to the Addenbrooke's Obesity Clinic or the Cambridge Community Obesity/Weight Loss Service.
2. Any person who was obese as defined by a Body Mass Index (BMI) of 30 or higher.
3. Aged 18 or over.
4. Ability to speak and read English fluently. This was required to complete the interview and self-report questionnaires, whose normative data is based on the English language speaking population.
5. The third research question requires the distinction between those participants who binge eat and those who do not. Binge eating will be initially identified by the EDE-Q and then verified using the DSM-IV diagnostic criteria and during the interview, enabling participants to be included in the appropriate group for analysis.

2.6.1.2 Exclusion criteria.

1. Those who potentially meet criteria for eating disorders other than BED (e.g. Bulimia Nervosa and Eating Disorders Not Otherwise Specified). This is screened by clinic staff, the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) and the DSM-IV diagnostic criteria (see section 2.8.3 for further details of the group allocation procedure).

2.6.2 Sample Size.

A convenience approach to sampling was adopted. Ten participants were interviewed. This was deemed an adequate sample size to achieve a broad representation of views for the qualitative component of the research. It was in accordance with previous research (Simpson & Papageorgiou, 2003; Spada & Wells, 2006), and was appropriate within resource and time constraints. The sample included six females and four males, aged between 23 and 61 years old. Further demographic details are presented in Table 1 in Section 3.2.1 of the Results.

2.7 Measures

A semi-structured interview and self report questionnaires were used to assess the constructs of interest in this study. Standardised measures existed for all of the constructs and have been used in previous studies investigating similar areas (e.g. Konstantellou & Reynolds, 2010 and Woolrich & Cooper, 2008).

Each measure used in the study is described below with a description of the measure, its psychometric properties (where available), and a rationale for using the measure in the current study. Where required the measures were purchased and permission to use the measures was sought from the relevant organisation or author. Copies of the interview schedule and measures used in this study are presented in Appendices A - F, in the order in which they are described. The interviews varied in length from approximately 45 minutes to one hour and 30 minutes, and in total the questionnaires took approximately 28 minutes to complete.

2.7.1 Qualitative Interview

2.7.1.1 Metacognitive Profiling Interview (Wells, 2000) (Appendix B).

The semi-structured metacognitive profiling interview is based upon the metacognitive profiling template (Wells, 2000). Wells and Matthews (1994) propose the use of "metacognitive profiling" to identify problematic processing routines and metacognitions

that are activated under conditions of distress. They note that metacognitive components of cognition can be determined by particular questions used in tracing recent episodes.

The interview assesses declarative beliefs about the meaning of thoughts, beliefs about cognitive control strategies and the nature of goals and cognitive processes activated. The template can be specifically adapted to fit the population being investigated. In this study participants were asked to think about a recent time they had eaten. Those who were binge eaters were specifically asked to think about this in relation to a binge eating episode. Prompt questions were used to set the scene (e.g. "where were you?", "what were you doing?"). Participants were then asked about what had triggered these situations, their emotions and what thoughts had gone through their mind. Using these identified thoughts, participants were asked about meta beliefs/appraisals of these thoughts and the advantages/disadvantages of thinking this way. Participants were also asked about the coping strategies they had used and their cognitive processes, including attention (e.g. "what were you paying attention to when you were eating?"), memory (e.g. "were any memories activated? What were they?") and judgements (e.g. "how did you form your judgements when you were eating?"). In line with the exploratory and qualitative nature of the study the researchers also demonstrated curiosity and flexibility to all topics as they arose during the interview.

Rationale for using the Metacognitive Profiling Interview.

The interview framework was used to obtain in-depth, qualitative data for conceptualising metacognitive and dynamic aspects of processing in (binge) eating episodes. The metacognitive profiling interview has been useful in the development of specific models of psychological disorders, including the cognitive model of generalised anxiety (Wells, 1995, 1997) and of social phobia (Clark & Wells, 1995). The interview framework has been used with people with AN and BN (e.g. Woolrich, Cooper & Turner, 2008), but to the author's knowledge it had not been used within the obese, binge eating or BED population. It

is however, a flexible framework and so the researchers specifically tailored it to focus on cognitive experiences during a (binge) eating episode.

2.7.2 Quantitative Self-Report Measures.

2.7.2.1 Demographic Information Questionnaire (Appendix C).

To contextualise the findings, a self-report questionnaire collected the following demographic information; participants' age, gender, ethnicity, marital status, current height and weight, highest and lowest ever adult weight and current and previous weight loss treatments. The length of time needed to complete this measure was approximately 3 minutes.

2.7.2.2 Eating Disorders Examination- Questionnaire (EDE-Q; Fairburn & Beglin, 1994) (Appendix D).

The EDE-Q provides a comprehensive assessment of eating disorder psychopathology; it is derived from and scored in the same way as the Eating Disorder Examination interview (EDE; Fairburn & Cooper, 1993). The EDE-Q contains 36 self-report items in total, all rated over the previous 28 days. Twenty-two items assess disturbed attitudes towards eating weight and shape and 14 items assess behavioural symptoms associated with eating disorders. Ratings include presence or absence and frequency of symptoms. The EDE-Q consists of four sub-scales; Restraint, Shape Concern, Weight Concern and Eating Concern. These are rated on a 7 point forced-choice rating scale (from 0-6, which measures both number of days and extent to which the question describes the respondent's behaviour). In addition, there is a Global score, which is the average of the sub-scale scores. Scores of four or above on individual items are interpreted as indicating disturbed attitudes more likely to be of clinical severity. The items which assess behavioural symptoms examine subjective and objective episodes of over-eating and objective bulimic episodes. Compensatory behaviours including self-induced vomiting and laxative use are also

assessed. The EDE-Q was designed to be straightforward and of a reasonable length. The length of time needed to complete this measure is approximately 10 minutes.

Validity and reliability of the EDE-Q.

The EDE-Q has been used in many previous studies as an assessment of eating psychopathology and is widely considered as a reliable screening tool (Mond, Hay, Rodgers, Owen & Beaumont, 2004). A number of studies have compared the EDE-Q with the EDE, which is considered to be the gold standard of eating disorder assessment (Wilson, 1993; Garner, 1995). Research demonstrates a high level of agreement between the two measures (.68 - .78) in assessing the core attitudinal features of eating disorder psychopathology (Mond et al).

The EDE-Q also has good internal consistency (alpha = .90) (Peterson et al., 2007) and test–retest reliability (r = .84) (Reas, Grilo & Masheb, 2006) and has been supported empirically with BED (Grilo, Masheb & Wilson, 2001b). Mond et al. (2004) report optimal validity coefficients for BED for the EDE-Q compared to the EDE (sensitivity = .83, specificity = .96).

Rationale for using the EDE-Q.

The EDE-Q was used as a screening tool as it is a comprehensive measure of eating disorders and therefore enabled the researchers to exclude people who met criteria for eating disorders other than BED (e.g. bulimia nervosa)

2.7.2.3 The Metacognitions Questionnaire-30 (MCQ-30; Wells & Cartwright-Hatton, 2004) (Appendix E).

The MCQ-30 (Wells & Cartwright-Hatton, 2004) assesses individual differences in metacognitive beliefs, judgements and monitoring tendencies. The MCQ-30 was based on the longer original version of the same instrument, the Metacognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997) which is a 65-item scale developed to assess several

dimensions of metacognition thought to be relevant to psychopathology following the conceptual analysis offered by the Wells and Matthews (1994; 1996) S-REF theory.

The MCQ-30 consists of 30 items, measuring 5 distinct metacognitive factors considered important in psychological distress; (1) cognitive confidence (e.g. "my memory can mislead me at times"); (2) positive beliefs about worry (e.g. "worrying helps me to solve problems"); (3) negative beliefs about thoughts concerning uncontrollability and danger (e.g. "when I start worrying, I cannot stop"); (4) cognitive self-consciousness (e.g. "I pay close attention to the way my mind works"), and (5) beliefs about the need to control thoughts (e.g. "not being able to control my thoughts is a sign of weakness"). Participants are asked to indicate how much they agree with each statement on a four-point scale, labelled "do not agree" at one extreme, and "agree very much" at the other. A higher total metacognitions score indicates a more maladaptive metacognitive style.

Validity and reliability of the MCQ-30.

Both the MCQ and the MCQ-30 have been demonstrated to have good psychometric properties of reliability and validity in an adult population (Cartwright-Hatton, Mather, Illingworth, Brocki, Harrington & Wells, 2004). The MCQ-30 demonstrates good to excellent internal consistency (alpha = .72-.93) and convergent validity, and good test-retest reliability (r = .75) (Wells & Cartwright-Hatton, 2004). The MCQ-30 was chosen over the MCQ as a more practical measure as it is less restricted by its length. The length of time needed to complete the MCQ-30 was approximately 5 minutes.

Rationale for using the MCQ-30.

The MCQ-30 was used to provide a multidimensional measure of metacognitive beliefs and monitoring tendencies which are central to the Self-Regulatory Executive

Function (S-REF; Wells, 2000; Wells & Matthews, 1994, 1996) model and most closely linked to the development and maintenance of psychological disorder.

2.7.2.4 Thought Control Questionnaire (TCQ; Wells & Davies, 1994) (Appendix F).

The TCQ is a 36 item, self-report measure that assesses the frequency of use of thought control strategies. The TCQ measures 5 factorially derived and conceptually distinct categories: (1) worry (e.g. "I focus on different negative thoughts"); (2) punishment (e.g. "I punish myself for thinking the thought"); (3) re-appraisal (e.g. "I try to reinterpret the thought"); (4) distraction (e.g. "I do something that I enjoy"); and (5) social control (e.g. "I ask my friends if they have similar thoughts"). Each subscale consists of six items rated on a four-point Likert-type scale (1 = never; 2 = sometimes; 3 = often; 4 = almost always). A total TCQ score is obtained by summing the individual subscales.

Validity and reliability of the TCQ.

A series of studies conducted by Wells and Davies (1994) indicate that the TCQ reliably measures a variety of empirically distinct control strategies. The TCQ has acceptable to good internal consistency (alpha = .64-.72) and test-retest coefficients indicate acceptable to very good standards of reliability (r = .67-.83) (Wells & Davies, 1994). Cronbach coefficient alphas demonstrate acceptable to good homogeneity of the sub-scale items (alpha = .64 – .79).

Measuring concurrent validity of the TCQ is limited as there are no other parallel measures of thought control available. However, relationships between TCQ subscales and a variety of other measures has been investigated, e.g. the Penn State Worry Questionnaire (Meyer, Miller, Metzger & Borkovec, 1990); Anxious Thoughts Inventory (Wells, 1994b); the Padua Inventory (Sanavio, 1988); the Eysenck Personality Inventory (Eysenck & Eysenck, 1964); and the Trait anxiety subscale (Spielberger, Gorsuch, Lushene, Vagg &

Jacobs, 1983). Overall, Wells & Davies (1994) found that the TCQ subscales worry and punishment, but not other TCQ subscales, predict a variety of scores on measures related to emotional vulnerability and psychopathology. Wells and Davies (1994) noted that these findings suggest that the use of worry and punishment to control unwanted thoughts is associated with proneness to emotional problems. They also hypothesised that other TCQ subscales, which did not correlate with neuroticism or trait anxiety, may be more closely linked to measures of emotional stability and adaptation. The length of time taken to complete this measure was approximately 5 minutes.

Rationale for using the TCQ.

The TCQ (Wells & Davies, 1994) was used to quantitatively examine the type of thought control strategies used by participants to control their worries. This enabled quantitative and qualitative interview data to be compared, enabling the relationship between the use of different types of strategies and measures of binge eating to be explored.

2.7.2.5 Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983).

The HADS (Zigmond & Snaith, 1983) is used to control for the confounding effects of co-morbid depression and anxiety. The HADS is a self-assessment screening questionnaire deigned to detect anxiety and depression in the medically ill population. It consists of 14 items, seven assess anxiety and seven assess depression. The scoring provides information on the potential presence and severity of anxiety and/or depression over the course of the previous week. Higher scores represent higher levels of psychopathology; a score of 8-11 on either scale indicates mild; 12-15 indicates moderate and 16-20 indicates severe anxiety or depression.

Psychometric properties of the HADS.

A literature review of the validity of the HADS demonstrated that most factor analyses shared a two-factor solution in good accordance with the HADS subscales for anxiety and depression, respectively (Bjelland, Dahl, Tangen, Haug & Neckelmann, 2002). Overall, the scale possesses good validity ($r > .90$) and reliability ($r > .80$) (Herrman, 1996; Mykletun, Stordal & Dahl, 2001; Zigmond and Snaith, 1983). Internal consistencies are also acceptable (alpha = .80-.93) for anxiety and (alpha = .81-.90) depression subscales (Herrman, 1996). The length of time needed to complete this measure is approximately 5 minutes.

Rationale for using the HADS.

Previous research has indicated that increased psychopathology, particularly depression is reported in people with more severe obesity and people with binge eating disorder. Whilst the focus of the current study is to examine metacognitive beliefs, judgements, monitoring processes and control strategies in obesity and binge eating, the participants' mood will also be assessed. This is to further clarify the relationship between mood and severity of binge eating and obesity, and also to identify any factors, such as depressed mood, which may impact upon participants' responses on other measures. The HADS is a reliable and valid measure and is used widely across clinical and non-clinical populations in both clinical work and research. It is helpful for using with medical groups because it has reduced reliance on somatic symptoms (Zigmond & Snaith, 1983), compared with other measures such as the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988) or the Beck Depression Inventory (BDI-II; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

2.8 Procedure

2.8.1 Recruitment.

Participants were recruited through either Addenbrooke's Hospital Obesity Clinic or the Cambridge Community Weight Management Service. Recruitment procedures were slightly different for each.

2.8.1.1 *Addenbrooke's Hospital Obesity Clinic.*

Clinic staff and the researchers gave all new referrals to the clinic a flyer which gave brief details about the study. Posters in the clinics also advertised the study and asked individuals to contact staff if they were interested in taking part. Posters and flyers included contact details for the researchers if people wished to discuss the study further. If an individual was interested in participating, then either staff members or the researchers provided them with a questionnaire pack.

2.8.1.2 *Cambridge Community Weight Management Service.*

People initially referred to this service are routinely triaged to determine whether or not they are obese. Those who are obese are then sent an invitation-to-treat letter from the service. If the individual responds to this letter and books an appointment, they are sent follow up information about their appointment. At this point, an information sheet about the research was sent out with the appointment information. The information sheet contained a section for those who were interested in taking part to complete, asking for consent to their contact details being passed on to the researchers so they could be contacted by telephone about the study. If interested, potential participants were asked to bring the completed information with them to their first appointment. Staff then passed their contact details to the researchers via nhs.net accounts. When the researchers telephoned the potential participants, they confirmed that the person was still interested in taking part and obtained verbal consent. Researchers then conducted a brief screen for binge eating disorder using the DSM-IV

diagnostic criteria over the telephone and sent them a questionnaire pack in the post. Each participant screened was allocated a number which was then allocated to the questionnaire pack they were sent out, to enable them to be linked. If a person did not return their questionnaire pack, the screening data were archived until the end of the study.

2.8.2 Data Collection

All packs included an information sheet (Appendix G and H), a consent form for the questionnaires (Appendix I), a reply slip to provide contact details to enable the interview to be arranged (Appendix J), all self-report measures and a stamped-addressed envelope (SAE). Participants either posted back their completed consent form, reply slip and questionnaires in the SAE provided to the University of East Anglia or returned them to the clinics and left them in specially provided collection boxes for the researchers to collect.

On receipt of the packs, participants were contacted by phone and asked if they were still willing to participate in the interview. Ten replies were received, all ten participants were contacted, all of whom agreed to participate in the research interview. No participants were excluded.

The researchers allocated participants to either the binge-eating or the non-binge eating group as detailed in Section 2.8.3. Following informed written consent (Appendix K) the interview was conducted. Interviews were conducted at a convenient time, date and location (either the participant's home or a GP surgery) for the participant. All interviews were digitally audio recorded and were informal and open-ended. All interviews were completed before the end of June 2012.

The semi-structured interviews were conducted in partnership with another Trainee Clinical Psychologist as part of their thesis for the University of East Anglia Doctorate in Clinical Psychology. Both researchers conducted five interviews each. Interviewers transcribed their own interviews and then data were pooled for analysis.

2.8.3 Group Allocation Procedure

Participants were allocated into groups on the basis of the presence or absence of binge eating (binge-eating group and non binge-eating group). Binge eating was initially assessed using responses on the EDE-Q as a guide; it was then checked and verified using the DSM-IV diagnostic criteria as a screening tool conducted over the phone. The researchers received training in implementing the diagnostic criteria and in the detection of binge eating and BED. Group allocation was discussed amongst both researchers to ensure the reliable and correct identification of key behaviours. Eating behaviour was again confirmed before the start of the interview and this process was standardised through further discussions between both researchers.

2.9 Ethical considerations

Ethical approval was sought and gained from Essex, East of England, NHS Research Ethics Committee (Appendix L). Research and development approval and letters of access were sought and gained from the trusts in which data were collected (Appendix M and N).

2.9.1 Consent and Coercion

All potential participants were initially approached about the study by a member of staff who worked in the participating services. Potential participants also had to opt in to the study (as opposed to opting out) and were able to consider the information sheet in their own time. Furthermore, the information sheet provided to all potential participants made explicit the purpose of the study, gave specific details of participant involvement, highlighted confidentiality procedures and the right to withdraw from the research process at any point without their current or future treatment being affected (in accordance with the Data Protection Act, 1998). The interview was also described verbally so participants knew what to expect and participants were given the opportunity to ask questions. All participants provided informed, written consent.

2.9.2 Confidentiality and Anonymity

All data collected were processed by the main or collaborating researchers. To ensure participants were not identifiable, names were replaced with numerical codes on all documents. All data were immediately coded into an anonymised form. In the reporting of results no personally identifying information was included.

2.9.3 Data Storage

Raw data from the questionnaires and participant details from the consent forms, interview recordings and transcripts were kept separately. Paper records were stored in locked filing cabinets whilst the research took place, the key to the codes was kept in a separate locked cabinet. All data were kept securely in accordance with the Data Protection Act (1998). Hard copies of participant data and all electronic data were only identifiable by a participant number and will be kept for five years after submission in accordance with NHS ethics committee guidelines. Participant contact details were passed to the researchers via secure nhs.net accounts.

2.9.4 Potential for Distress

The study did not involve exposing participants to unpleasant or harmful situations and it was not expected that the measures would cause distress to participants. However, it was acknowledged that the research may involve discussing topics of a sensitive nature. Accordingly participants were informed that if they did become distressed they could take a break or withdraw from the study at any time point. Participants were provided with the researchers' contact details if they wished to discuss any issues arising from the study, had any concerns, or wanted any further information. It was planned that if participants became distressed during participation in the interview, it would be stopped and a researcher would provide support, however this plan did not need to be implemented. The researchers had

clinical skills and experience of dealing with distress and were able to use those skills if necessary. If a participant was to become very distressed the following plan of action was would be implemented: the contact details of the participant's GP would be requested with the participant's permission, and they would be contacted. If the level of distress gave rise to concern the Lead Consultant in Liaison Psychiatry in Cambridgeshire and Peterborough NHS Foundation Trust would also be informed. Any relevant others would be contacted. All actions taken and relevant notes would be clearly documented in the participant's medical records. This plan had been discussed and agreed with research supervisors and shared with the participating services; however it did not need to be implemented with any participants in the study.

In addition, following interviews participants were asked if they were concerned about anything that arose during the interview to allow debriefing. If necessary, the researchers would have signposted the participant to whom might best deal with the participants concerns, for example their GP or a member of staff at the obesity/weight loss clinic. However these plans did not need to be implemented at any point during the data collection.

2.9.5 Psychological Problems

Addenbrooke's obesity clinic routinely screens patients to assess for the presence of binge eating, anxiety and depression. The community clinics also routinely screens for anxiety and depression and would screen for binge eating where they think it is appropriate to do so and so staff should have already been aware of any participants with significant psychological problems. Therefore, it was not anticipated that participants' responses on the measures used in this research would indicate any previously unidentified psychological problems or concerns. If however this had been the case the relevant services would have been informed, with the participant's permission.

2.10 Analysis

2.10.1 Analysis of Qualitative Interview Data

2.10.1.1 Rationale for using template analysis.

Several qualitative methods were considered with which to analyse the data, with template analysis being deemed preferable for meeting the aims of this research. Epistemology guides the choice of method used to analyse data (Carter & Little, 2007). Template analysis is suited to the critical realist position of this research (see Section 2.4), as the researcher is attempting to uncover the underlying causes of particular human phenomena, whilst also being reflexive by acknowledging how their views and assumptions may impact on the process of analysis and template development (King, 2004).

King (1998) describes template analysis as sitting between the qualitative methods of content analysis (Weber, 1985) and grounded theory (Glaser & Strauss, 1967). In content analysis themes are determined before data analysis, making it a fixed and rigid method. In comparison, the pre-determined themes in template analysis are seen as "provisional" and "open to modification" as the data is reviewed (King, Carroll, Newton & Dornan, 2002, p.334). Grounded theory analyses data without acknowledging existing data, which would have been inappropriate in this research as it was exploring the applicability of the S-REF model to the data.

Template analysis encompasses both a deductive approach, allowing researchers to explicitly state their assumptions and include "a priori" ideas about data based on existing knowledge, and an inductive approach, which is characterised by a degree of openness and allows themes to emerge and templates to be modified to organise data (King, 2012). Template analysis was considered most appropriate as this research was focused upon the applicability of the pre-existing theoretical framework provided by the S-REF model to the data. Through qualitative supervision and the Qualitative Research Forum at the University

of East Anglia it was agreed that two separate templates, one per participant group, would be developed. This enabled the group templates to be compared and contrasted allowing group differences and similarities to be observed, demonstrating how understandings developed. The refining and adaptation of the templates throughout the process of analysis enabled theory-driven expectations to be compared to data-driven findings and so the development of the templates and the researcher's understanding was transparent.

2.10.1.2 Data analysis

Analysis of the data was performed using template analysis (King, 1998). Template analysis refers to a particular way of thematically analysing qualitative data. It involves the development of a hierarchical coding "template", which summarises themes identified by the researcher as important in a data set, and organises them in a meaningful and useful manner. Template analysis was conducted in line with King's (2004) recommendations, as outlined below;

2.10.1.3 Define a priori themes.

King (2004) suggests that it can be useful to identify a priori themes prior to data collection. The a priori themes are pragmatic tools; they enable themes which are well identified in the literature to be made part of the analysis procedure in a transparent process. This is important within this research as prior to data collection and analysis there were expectations of how the data may present. The a priori themes in this research had a theoretical basis, derived from the S-REF model (Wells & Matthews, 1994, 1996), previous metacognitive research and the Metacognitive Profiling Interview schedule (Wells, 2000). Consequently two a priori hierarchical template sequences have been identified; one for participants who binge eat and one for those who do not binge eat (see the Results Section in Chapter Three).

2.10.1.4 Transcription.

Audio tapes were transcribed verbatim by the interviewer as part of the familiarisation with the data. Each line of the transcript was numbered. Personally identifying information was removed (see Appendix O for a sample transcript). The text was read again as a whole whilst listening to the audio recording prior to coding.

2.10.1.5 Initial coding.

Coding is the process of identifying themes in accounts and attaching labels (codes) to index them. The first three transcripts were coded. Data relevant to a priori themes were gathered and coded. When data were identified that were relevant to the research questions but could not be encompassed within an existing theme, the theme was either modified or new themes were developed.

2.10.1.6 Initial template (Appendix P).

Given the critical realist approach, guidance from the qualitative research forum at the University of East Anglia and resource and time constraints the initial template was produced after the coding of three transcripts. The initial template consisted of a synthesis of the a priori themes and first impressions from the initial coding of the data. Themes were identified hierarchically allowing varying levels of specificity, with broader themes encompassing narrower, more specific ones.

2.10.1.7 Developing the template.

In line with King's (2004) recommendations, the templates were applied to the whole data set. When relevant data did not fit within an existing theme the template was altered in an iterative process until all the data were accounted for. This process involved themes being inserted, removed, modified and re-classified. To help identify an appropriate end point in altering the templates and re-coding, another researcher (Stephanie Ashton, Trainee Clinical Psychologist) checked the application of the templates against three transcripts to ensure the

templates represented the themes in the data. The final templates were then used to interpret the findings as presented in Chapter Three, using examples from the data.

2.10.2 Analysis of Quantitative Self-Report Measures

The quantitative data were presented (see Chapter Three Results) to contextualise the sample and allow initial comparisons between participants and the participant groups, locating them in respect to other relevant research studies. Due to the small sample size the quantitative data were not statistically analysed.

2.11 Methodological and Reflexive Rigour

There is no agreed single set of criteria that researchers should use to evaluate all qualitative studies; instead, a variety of criteria has been proposed (King, 1998). Qualitative research methodologies vary considerably in their aims and epistemological assumptions and therefore the methods or procedures employed, consequently the appropriate evaluation criterion varies (Finlay, 2006). Madill et al. (2000) noted that "qualitative researchers have a responsibility to make their epistemological position clear, conduct their research in a manner consistent with that position, and present their findings in a way that allows them to be evaluated properly" (Madill et al., 2000, p.17). With consideration of the critical realist position of this research, the principles below are drawn from guidelines published by Lincoln and Guba (1985) and Henwood and Pidgeon (1992). The Henwood and Pidgeon guidelines are also appropriate as they emphasise how research and knowledge can be strengthened and enriched through the use of mixed qualitative and quantitative methods, noting that they do not derive from incommensurable paradigms. All guidelines were considered from the outset of the current research project, to ensure "trustworthiness" (Guba & Lincoln, 1981) was built into the research process and actively attained, rather than proclaimed on completion.

2.11.1 Credibility and Trustworthiness

Credibility and trustworthiness of the data were strengthened by negative case analysis and triangulation. Negative case analysis is the process of actively looking for data that do not appear to support the emerging model. This ensured that there was flexibility and variation included in the model (Strauss & Corbin, 1998).

Triangulation involves using multiple data sources to produce an account which is rich, robust, comprehensive and well-developed. Several types of triangulation have been identified (Denzin, 1978; Patton, 1999). Methodological triangulation was achieved through the collection of both quantitative and qualitative data; these approaches are usually seen as different ways of studying the same phenomenon and as able to answer the same research questions (Bryman, 1988). Different methods have different strengths and weaknesses and therefore the main effect of methodological triangulation is to overcome the weaknesses of any single method. If the methods provide consistent data, and therefore mutual confirmation, confidence in their validity is enhanced; if data diverge greater insight can be gained.

All data were collected collaboratively with another Trainee Clinical Psychologist enabling analyst triangulation. The data and analysis were discussed with collaborative researchers, within qualitative research supervision and the qualitative research forum provided by the University of East Anglia. This enabled multiple perspectives of the data to be converged. As suggested by Mackey and Gass (2005) to enhance trustworthiness of the coding two of the interview transcripts were coded by both investigators. Codings were compared and contrasted, any discrepancies were discussed and resolved, and the coding template was modified if necessary. As noted previously, the final template was also

reviewed by another researcher against three randomly selected transcripts to ensure the templates represented the themes in the data.

Different data sources were triangulated through the user questionnaire, interview and observation data. This allowed accounts to be verified and contextualised within and between participants, as well as gaining rich, in-depth insight.

2.11.2 Validation

Validation is concerned with verifying the research findings. Throughout the interviews, paraphrasing and checking understanding was used to carry out informal member checking. Participants were also offered the opportunity to read the transcripts of their interviews and comment on their accuracy, however all participants declined. Member checking as a technique has been criticised by Morse (1994), Angen (2000) and Sandelowski (1993) on a number of levels and so this may not have negatively affected the validity of accounts.

2.11.3 Transparency

All aspects of the research process including the data collection process and analysis were disclosed and an auditable trail was made. Template analysis is noted for its explicit analytical process and its accessibility for viewing and assessment by people other than the primary analyst (Pope, Ziebland, & Mays, 2000). Through the transparency of a priori codes, the development of theory, and the higher and lower concepts the structure of emergent theory is evident.

Transparency was also achieved by conveying the findings using anonymised quotes from the data (Creswell, 2003; Creswell & Miller, 2000). Examples of raw data illustrate the analytic procedures allowing readers to evaluate the findings, and give a voice to participants.

2.11.4 Sensitivity to Context

Due to the theory-driven nature of this research, sensitivity to the theoretical context is vital. Therefore efforts have been made to place this research in its research milieu through providing the theoretical background of the research. The use of quantitative self-report measures also enables comparisons with previous relevant research, where these measures are the typical data collection method.

Demographic details have been provided to ensure the sample is contextualised, this is important so that readers are able to understand how the findings may be relevant beyond the specific study (Elliott, Fischer, & Rennie, 1999).

2.11.5 Reflexivity

In line with the critical realist stance of this research, it is acknowledged that the researcher brings their own "lens" to the research. To make the "lens" explicit, there was a full disclosure of the researchers' orientation and assumptions in relation to this research (see Section 2.4). In accordance with Lincoln and Guba's (1985) advice, a 'reflexive journal' was also kept during the research process. This included the likely impact of the researcher's own attitudes, beliefs, and theoretical orientation. It is possible that the researcher's profession as a Trainee Clinical Psychologist will have impacted upon the rapport developed with the participants and how sensitive issues were explored, with participants seeming to be open and honest in their responses. The researcher's expectations, knowledge of the S-REF theory and relevant research is also likely to have influenced the research through the direction of questioning. Care was taken to question findings, with regard to possible biases, as they emerged. This left a paper trail which is open to external audit (Lincoln & Guba, 1985) as well as increasing researcher reflexivity. Excerpts from the reflective account are provided throughout Chapter Three Results Section.

Chapter Three

Results

3.1 Summary

This section presents the results of the study, and demonstrates how the analysis (described in the previous section) answers each of the research questions. It begins by contextualising the sample. The participants' demographic details are provided, followed by a summary of their scores on the quantitative measures and the use of quotes in the presentation of the results is defined. Following this, the results will be divided into three sections, according to each research question. The a priori themes and final templates are presented separately for each of the participant groups: participants with and without binge eating or BED.

The first research question refers to the participants who report binge eating. The a priori themes and the data-driven final template for this group are outlined followed by a more detailed discussion of the findings.

The second research question refers to participants who do not report binge eating. A summary of the results from these participants is presented, including the a priori themes and the final template. Each theme is discussed in detail and any differences between the a priori and final templates are outlined.

In the final section, the templates for the two groups are compared. Similarities and differences in the two templates are presented and explored in more depth. This section concludes with an overall summary of the main results. Excerpts from the researcher's reflective account are provided throughout the sections.

3.2 Contextualising the Sample

3.2.1 Demographic Characteristics of the Sample

The sample included ten participants, five reported binge eating, and five did not. Nine of the participants were recruited from Addenbrooke's Obesity Clinic, and one was recruited from Cambridge Community Obesity/Weight Loss Service. To contextualise the sample and enable the two groups to be compared, further demographic details as reported in the demographics self-report questionnaire are presented in Table 1.

Table 1

Demographic characteristics of participants with and without binge eating.

Participant number	Gender M/F	Age	Marital Status	Employment status	Height (metres)	Weight (kg)	BMI	Previous treatment
				Binge eaters				
P1	F	52	Divorced	Employed Part-time	1.75	130.1	42.5	Commercial programmes[1]
P2	F	23	Single	Un-employed	1.65	135.1	49.6	Diets[2], commercial programmes
P3	F	29	Married	Employed Full time	1.67	135	48.4	Medication[3], diets
P4	F	45	Separated	Un-employed	1.58	115.1	46.1	CBT, diets, hypnotherapy
P5	F	52	Married	Sick leave	1.58	146.1	58.5	Commercial programmes
				Non-binge eaters				
P6	M	61	Married	Un-employed	1.83	121.3	36.2	-
P7	M	61	Married	Employed Full time	1.78	155	48.9	Commercial diets
P8	M	46	Single	Employed Full time	1.86	235	67.9	Commercial diets
P9	F	42	Married	Employed Full time	1.52	146.1	63.2	hypnotherapy
P10	M	52	Married	Un-employed	1.8	159	49.1	-

Note. P = Participant; M = Male; F = Female; Kg= kilogrammes; BMI=Body Mass Index; - = data unavailable; 1; Commercial weight loss programs included weight watchers, slimming world and weigh2go; 2 = Diets included Montignac diet, Cambridge diet, and individual diets; 3 = Medication reported was Orlistat

Overall, there does not appear to be many differences between the binge eating and the non binge-eating groups, apart from gender. The binge-eating group consisted solely of females, the non binge-eating group contained one female and four males. All participants described their ethnicity as white. The age of participants in the binge-eating group ranged from 23-52 years, this is greater than the non binge-eating group, which ranged from 42-61 years. Within the binge-eating group, two were married, one was single, one was separated and one divorced. In the non binge-eating group four were married and one was single. With regards to occupational status, within the binge-eating group, two were employed full-time, two were unemployed and one was on sick leave. In the non binge-eating group three were employed full-time and two were unemployed. The range of BMI's was smaller within the binge-eating group (42.5-58.5) compared to the non binge-eating group (36.2-67.9). All participants in the binge-eating group had experience of previous treatment, compared to three of the non-binge eaters; there were overlaps between the two groups in the types of treatment received.

3.2.2 Quantitative Results

Because of the small number of participants it was not deemed appropriate to conduct any statistical analysis on the questionnaire scores. Consequently the scores from the quantitative measures are presented in Tables 2-5 below. Discussion of the scores on the questionnaires and any potential differences between the binge-eaters and non binge-eaters must be interpreted with caution due to the very small sample size.

Table 2

EDE-Q scores for participants with and without binge eating; Scores of four or above indicate disturbed attitudes more likely to be of clinical severity.

Participant number	EDE-Q Subscales				EDE-Q Global
	Restraint	Shape	Weight	Eating	
			Binge Eaters		
P1	2.4	2.1	2.2	1.8	2.13
P2	3.8	5.25*	3.6	4.2*	4.21*
P3	3.8	4.75*	5.4*	3.2	4.29*
P4	4.8*	5.25*	6*	5.4*	5.36*
P5	1	3.75	4.4*	4.8*	3.49
			Non Binge Eaters		
P6	0	1.37	1.0	0.40	0.69
P7	0.40	2.62	2.40	0.40	1.45
P8	1.6	4.12*	3.6	2.4	2.93
P9	0	3.75	3.40	0.40	1.88
P10	0	1.75	1.20	0.60	0.88

Note. P = Participant; EDE-Q = Eating Disorders Examination- Questionnaire (Fairburn & Beglin, 1994).

* score above 4.

Initial observations of the EDE-Q results indicate that there is some overlap between the participants with and without binge eating. However, the binge eaters' scores tend to be more likely to indicate clinical severity. Scores of four or above on individual subscales are interpreted as indicating disturbed attitudes more likely to be of clinical severity. The binge eaters reported scores of four or above on 13 occasions, compared to once by the non-binge eaters. It is noteworthy that P1 was the only participant in the binge-eating group not to report any scores above 4.

Items 13 – 18 on the EDE-Q assess subjective and objective episodes of over-eating and objective bulimic episodes, as well as compensatory behaviours over the previous 28 days. No participants reported having engaged in self-induced vomiting or laxative use. Table 3 indicates the number of times each participant ate an unusually large amount of food, had a sense of having lost control over their eating, and the number of days that they overate and experienced a loss of control. The final column indicates the number of times participants exercised in a "driven" or "compulsive" way to control their weight, shape, amount of fat, or to burn off calories.

Table 3

EDE-Q scores on the binge eating indicators for all participants.

Participant number	Number of times		Number of days lose control and overeat	Number of times exercised
	Eat large amount	Lose control		
		Binge Eaters		
P1	2	2	2	0
P2	0	3	3	3
P3	30	30	20	2
P4	28	0	28	0
P5	0	0	3	0
		Non Binge Eaters		
P6	0	0	0	0
P7	28	6	1	24
P8	0	0	0	0
P9	4	2	1	0
P10	0	0	0	0

Note. P = Participant; EDE-Q = Eating Disorders Examination- Questionnaire (Fairburn & Beglin, 1994).

On the EDE-Q, P7 and P9, within the non binge-eating group did report indicators of binge eating, for example feeling out of control and eating an unusually large amount. Contrastingly, P2 and P5 in the binge-eating group did report having overeaten and experienced a loss of control, but did not report having eating an unusually large amount or having lost control when they were assessed by the EDE-Q as separate dimensions. As noted in the method section, and as recommended by Wilfley, Schwartz, Spurrell, and Fairburn (2000), all participants' answers were checked using the DSM-IV criteria of binge eating and before the start of the interview. They were also repeatedly addressed during the Metacognitive Profiling Interviews (Wells, 2000). This assessment method enabled the features of binge eating to be clarified to improve the validity and reliability of the EDE-Q. According to this more thorough assessment method, none of the participants in the non binge-eating group met any criteria for binge eating or BED. This is consistent with research which indicates that the EDE-Q yields higher levels of disturbance when measuring subjective bulimic episodes and objective overeating in individuals with binge eating and BED, than the Eating Disorder Examination interview (EDE; Fairburn & Cooper, 1993) (Grilo, Masheb, & Wilson, 2001; Wilfley, Schwartz, Spurrell, & Fairburn, 2000). It seemed that the answers given on the EDE-Q questionnaire did not reflect the reality of the participants' eating behaviour, and more likely reflected a misunderstanding of the items within the EDE-Q (this is addressed further in section 4.3.4.3.1, of Chapter Four, the Discussion).

Table 4

MCQ-30 scores for participants with and without binge eating.

Participant number	MCQ-30 Subscales					MCQ-30 Total
	Cognitive confidence	Positive beliefs	Negative beliefs	Cog self-conscious	Uncontrollable	
			Binge Eaters			
P1	19	6	6	10	6	47
P2	24	14	15	11	20	84
P3	14	24	23	17	24	102
P4	21	6	9	12	15	63
P5	14	10	19	14	24	91
			Non Binge Eaters			
P6	10	10	10	11	14	55
P7	24	6	6	8	6	50
P8	12	11	8	12	9	52
P9	7	6	10	24	15	62
P10	9	7	6	6	7	38

Note. P = Participant; MCQ-30 = The Metacognitions Questionnaire-30 (Wells & Cartwright-Hatton, 2004).

Norms are not available for the MCQ-30, but observation of the results in Table 4 indicates that participants in the binge-eating group reported higher levels of metacognition. There is some overlap in the MCQ-30 Total scores, but there are substantial differences in the subscale scores between the two groups, with the binge eaters reporting higher scores. A higher metacognitions score indicates a more maladaptive metacognitive style.

Table 5

TCQ scores for participants with and without binge eating.

Participant number	TCQ Subscales					TCQ Total
	Worry	Punish	Reappraise	Distraction	Social control	
			Binge Eaters			
P1	6	6	16	16	16	60
P2	12	13	13	13	15	66
P3	16	18	14	19	15	82
P4	6	12	19	20	6	63
P5	10	11	9	13	8	51
			Non Binge Eaters			
P6	11	8	9	12	10	50
P7	7	6	11	19	12	55
P8	9	8	10	21	6	54
P9	13	10	18	12	12	65
P10	6	6	6	7	6	31
TCQ Norms						
			Males			
Mean	10.53	10.19	14.92	14.58	13.58	49.22
SD	2.88	3.20	3.33	3.06	3.36	7.27
			Females			
Mean	10.23	9.83	13.80	14.61	14.42	48.29
SD	2.55	2.67	2.49	2.89	3.27	6.21

Note. P = Participant; TCQ = Thought Control Questionnaire (Wells & Davies, 1994); SD = Standard Deviation.

When comparing the groups use of the thought control strategies it seems that the binge eaters engaged in greater attempts to control their thoughts. The binge-eating group particularly reported using self-punishment more frequently than the non binge-eating group. However, overall, there does not seem to be a difference between the total scores in either of the groups compared to the TCQ norms, which were derived from a sample of undergraduate and postgraduate students between 18 and 47 years of age (N=229; 96 males, 133 females) (Wells & Davies, 1994).

Table 6

HADS scores for participants with and without binge eating.

Participant number	HADS Subscales				HADS Total Score
	Anxiety		Depression		
	Raw score	Classification*	Raw score	Classification*	
			Binge Eaters		
P1	9	Mild	4	Normal	13
P2	15	Moderate	15	Moderate	30
P3	15	Moderate	11	Moderate	26
P4	7	Normal	3	Normal	10
P5	13	Moderate	12	Moderate	25
			Non Binge Eaters		
P6	14	Moderate	10	Mild	24
P7	0	Normal	2	Normal	2
P8	10	Mild	9	Mild	19
P9	7	Normal	9	Mild	16
P10	-	-	-	-	-

Note. P = Participant; Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983); - = data unavailable.

* Snaith and Zigmond, (1994) recommend that for both the Anxiety and Depression scales, raw scores of between 0-7 is normal, 8-10 identify mild cases, 11–15 moderate cases, and 16 or above, severe cases.

The HADS scores indicate that the binge-eating group experienced greater anxiety and depression in comparison to the non binge-eating group. Scores for the binge eaters were classified as being in the moderate range six times, in comparison to once for the non-binge eaters. However, overall the non binge-eating group did still experience levels of anxiety and depression higher than expected in the general population.

3.3 Quotations

Quotations from the interviews are used to illustrate the main findings. This was done to ground the findings in the data and allow the reader to hear the participants' voices. The following explains the marks made to quotations:

. . .	= intentional omission of irrelevant data
. . . .	= words between a sentence left out
[text]	= researcher's words , used to clarify
CAPITALS	= shouting
P	= participant (followed by their individual participant number)
I	= interviewer

3.4 Research Question One

What are the metacognitive knowledge, processes and control strategies experienced by participants with obesity and binge eating in relation to thoughts about eating?

The a priori themes had a theoretical basis, derived from the S-REF model (Wells & Matthews, 1994, 1996), previous metacognitive research and the Metacognitive Profiling Interview schedule (Wells, 2000). Three main themes and 10 sub-themes were identified in the a priori themes. The a priori themes will not be discussed comprehensively as they constitute the beginning of the analysis.

Figure 2. **a priori themes for participants with obesity and binge eating.**

1. Metacognitive knowledge
    1.1 Positive and negative beliefs about worry
    1.2 Low cognitive confidence
    1.3 The need to control thoughts
    1.4 Cognitive self-consciousness
2 Metacognitive processes
    2.1 Memories triggered
    2.2 Selective attention allocation
3. Meacognitive thought control strategies
    3.1 Rumination/worry
    3.2 Self punishment
    3.3 Suppression
    3.4 Threat monitoring

Following the development of the a priori themes, the transcripts were coded with each code being related back to the a priori themes. This created a template which was modified as subsequent transcripts were coded, enabling the final template to incorporate each theme. The data supported the inclusion of all main a priori themes, with the inclusion of further sub-themes that emerged from the interview data. Within template analysis it is a subjective judgment as to when the final template can be considered ‘complete’. However the participants in this group were consistent in their responses and so it became clear towards the end of analysis that little new information was being generated and so analysis reached a natural endpoint.

Figure 3. **Final template for participants with obesity and binge eating.**

1. Metacognitive knowledge
    - 1.1 Metacognitive beliefs
        - 1.1.1 Positive metacognitive beliefs
            - 1.1.1.1 Functional
            - 1.1.1.2 Maintain cognitive control
        - 1.1.2 Negative metacognitive beliefs
            - 1.1.2.1 Uncontrollability
            - 1.1.2.2 Harm
        - 1.1.3 Simultaneous positive and negative beliefs
    - 1.2 Metacognitive Appraisals
        - 1.2.1 Low cognitive confidence
        - 1.2.2 Heightened cognitive self-consciousness
        - 1.2.3 Goals
            - 1.2.3.1 Not met
            - 1.2.3.2 Not identified/ inconsistent
            - 1.2.3.3 Emotional response
2 Metacognitive processes
    - 2.1 Negative memories triggered
    - 2.2 Selective attention allocation
        - 2.2.1 During a binge eating episode
            - 2.2.1.1 Self-focused attention
        - 2.2.2 Outside of a binge eating episode
            - 2.2.2.1 Attend to rumination.
            - 2.2.2.2 Intrusive thoughts

2.2.2.3 Biased attention to others

3 Metacognitive thought control strategies

3.1 Implicit rumination

3.2 Thought suppression

3.3 Self punishment

3.4 Cognitive distraction

The final template for participants with obesity and binge eating will now be described in more detail, presenting each theme at a time and using illustrative quotes from the anonymised transcripts. These results will be discussed with specific reference to the first research question "What are the metacognitive knowledge, processes and control strategies experienced by participants with obesity and binge eating in relation to thoughts about eating?"

3.4.1 Theme One: Metacognitive Knowledge

Metacognitive knowledge, i.e. the beliefs individuals hold about the meaning, consequences and nature of their thinking (Wells, 2000), was prominent within the binge-eating group. The explicit nature and prevalence of metacognitive knowledge is consistent with Wells and Matthews' (1994) S-REF theory, which predicts that metacognitive beliefs are positively associated with maladaptive forms of coping and the development and persistence of emotional disorder.

3.4.1.1 Positive metacognitive beliefs.

Positive metacognitive beliefs emphasised the advantages of worrying about bingeing. From a metacognitive standpoint, positive beliefs may be conceptualised as a specific form of binge expectancy, relating to the use of food as a means of regulating and controlling cognition and emotion.

3.4.1.1.1 Functional.

Positive beliefs reflected the functional aspect of using food to regulate negative emotional and cognitive states. Bingeing and thoughts about bingeing were repeatedly viewed as being useful in maintaining and restoring one's emotions, often through distraction, and so were considered to be soothing and compassionate.

P1: I do think in some ways it is being quite adaptive and it is helping me to cope with those emotions and I stop eating at the point the emotional reaction is down

I: So you actually see it as quite a helpful strategy in itself

P1: Yeah thinking about it, it, it's quite a helpful strategy in itself, it's really the effect of the strategy that's not good.

3.4.1.1.2 Maintain cognitive control.

Participants reported positive metacognitive beliefs relating to the maintenance of cognitive control. Repetitive thinking about one's cognitions, for example worrying, was viewed as a helpful strategy as it enabled problem solving, making it less likely that something negative, i.e. binge eating will happen. Participants reported that if they closely monitored their cognitions and emotions then they may not lose control of them.

P1: It makes sure you prepare, it makes sure you research what's happening, it's kind of, also I think prepares you emotionally for something difficult

These positive beliefs were also reflected as reducing the likelihood of binge eating, a behaviour which is characterised by loss of control. Participants seemed to equate loss of control over cognitions as related to a loss of control over their eating (behaviour), although in reality these may not be equivalent. This perception may then reinforce the use of worry and/or monitoring as a strategy.

P2: If I worry too much about what I'm doing then I stop [eating]

3.4.1.2 Negative metacognitive beliefs.

Negative metacognitive beliefs emphasised the risks and negative consequences associated with one's cognition. Negative metacognitive beliefs may have a crucial role in the perpetuation of bingeing by becoming activated during and following a binge eating episode, and triggering negative emotional states and mental regulation strategies that compel an individual to eat more.

3.4.1.2.1 Uncontrollability.

Participants were particularly concerned about their perceived lack of control over their negative cognitions and cognitive functioning. It seemed that negative beliefs were of a ruminative nature. Participants described having to fight against their own cognitions, and attempt to exert control but often feeling powerless to do so.

P3: I am aware that feeling like that [worried, having uncontrollable thoughts] feels very stuck, because I reject it, I try to fight against it and it becomes bigger.

3.4.1.2.2 Harm.

The second subtheme relates to the harming impact of negative beliefs. Participants described how negative beliefs were related to the experience of negative emotions, particularly guilt and shame. Negative beliefs were also reported as being associated with binge eating. Binge eating was consistently viewed as harmful and dangerous due to the associated negative emotions and cognitions, which participants described as intense and overwhelming. These were recalled to be both triggers and consequences of binge eating.

One participant clearly identified and articulated the presence of her negative beliefs, which she described as pressurising her to binge eat, reducing her self-control and self-confidence that she is able to prevent binge eating.

P4: I know it sounds stupid but I have got a picture of him [negative voice]. He has always got a little, it is a spiky, eerie voice, and he is always saying "go on, go on, you know you will

do it anyway, so why the hell bother being good anyway?" "Why wait until 5pm at night and have a binge when you know that if you have it now, you can have another one at 5pm"

3.4.1.3 Simultaneous positive and negative beliefs.

All participants in the binge-eating group held both positive and negative beliefs simultaneously; however the negative beliefs appeared to be more accessible. This may be due to them being either more dominant or more emotionally arousing due to the fear they invoke. The occurrence of contradictory, and therefore conflicting positive and negative beliefs was often articulated as a constant battle of competing beliefs. Participants reported that they attempted to control the conflicting beliefs but expressed regular feelings of having been "beaten" by the negative beliefs.

P4; My thoughts are saying, "you shouldn't be eating, you're not supposed to eat, you are a fat cow, you are ugly, you are not allowed to eat, you shouldn't be eating". But then my little nice voice says "you are not fat, you are just right, you are you. And if you need to lose a little weight, that's fine don't eat as much, leave a little on your plate if it makes you feel better, but you are entitled to eat as much as the next person" but "YOU SHOULD BE EATING, EAT THOSE EXTRA CHIPS AND EAT THE CHIPS THAT THE OTHER PERSON HAS LEFT" and she says "no you don't need to, you are fine"

P2: it's an advantage to worry because I'm actually worrying about myself you know but it's a disadvantage cos why should I worry about, why should I worry about what people think of me, you know, I should only be worrying about what I think of me and if I think it's alright then it's alright

3.4.1.4 Metacognitive appraisals.

The metacognitive appraisals identified by participants in the binge-eating group consisted of low cognitive confidence, heightened cognitive self-consciousness and either a

lack of goal setting, or the setting of inconsistent or poorly identified goals, which were associated with emotional responses.

3.4.1.4.1 Low cognitive confidence.

Participants in the binge-eating group appeared to display low cognitive confidence. Participants reported not trusting their own thoughts, as they were considered to be dangerous, e.g. negative thoughts want to cause harm. Many participants reported feeling that they had lost control of their thoughts, and whilst they attempted to regain control they reported often failing to do so.

*P4: If other people are around it is like "you're not gonna F****** [expletive] win, you're not gonna F****** [expletive] win", I go into the bathroom and say it, but if I am on my own I shout at it [thoughts] "no way, you are not going to win today, this is my day and you are not going to put me down, you're not going to shove me in the corner, I am going to be ok, and I am gonna do this"*

3.4.1.4.2 Heightened cognitive self-consciousness.

The meta-cognitive characteristic, cognitive self-consciousness refers to the heightened tendency to focus attention on one's own mental processes regardless of thought contents. Participants who reported binge eating reported an awareness of their own mental processes and a need to monitor, evaluate and control their thoughts. Participants in the binge-eating group commonly reported questioning their own thoughts, but being unable to answer their questions.

P6: I ask myself logical questions but I get very illogical answers, for example "because I have to finish it

P1: How do I cope? What do I do? What do I do? What do I do? Eat, eat, eat, it was an attempt to somehow cope but I didn't, I couldn't see any positives in that, oh I sort of oh my god I ate again, you know

P3: Why am I doing this? Why do I need to eat this when I am not hungry and I know it is bad for me anyway, and I know it has no nutritional value as such? I ask myself those questions . . . I do ask myself, but I can't find the answer to stop it

3.4.1.4.3 Goals.

Wells (2000) suggests that the S-REF configuration is goal directed. The aim is to reduce discrepancies between the current and desired representations of the self.

Goals not met.

Many participants reported that they were unable to achieve their self-regulatory goal. It seemed that participants' goals were often rigid, unrealistic and inflexible. In addition, these goals did not tend to have a time limit, for example goals were often to "never binge again."

P3: The goal is to not binge eat and 99.9% of the time I do not achieve the goal

Such goals are very difficult to achieve without repeated attempts and sustained effort. Such unrealistic goals are prone to activating repeated instances of S-REF activity as a failure to meet goals activates S-REF processing aimed at reducing discrepancies.

P1: Sometimes I get myself so distracted that I don't deal with whatever you know practical things that need to be done to deal with the situation, sometimes I just get so hooked up on dealing with the emotional edge

Goals not identified/inconsistent.

In addition, some participants within the binge-eating group also reported being unaware of what their goal, or desired state was. Goals were either not identified, or were inconsistent. Consequently it was not possible for them to appraise whether the self-regulatory goal has been achieved.

P3: I was doing this but I didn't know what the end goal was

P4: when the nice voice is on my goal is just to enjoy my day, when the bad voice is on it is "you are not going to ruin my day, not anymore"

Emotional response.

All participants in the binge-eating group reported distress after binge eating, particularly in the form of self-disgust and worthlessness. There seemed to be a sense of shame that they had used binge eating as a method of controlling their emotions.

P2: I actually feel worse about myself that I've been on the binge, that I've had to have food to make me feel better

*P3: Before, I feel a need to eat this so I can feel safe, whilst I'm eating it I feel I am eating it because I need to finish it. And then once I've eaten it I feel "oh s*** [expletive] I've just eaten that". . . and I feel worthless because I gave in*

3.4.2 Theme Two: Metacognitive Processes

Metacognitive processes comprise a range of executive functions which coordinate cognition, including attention allocation, monitoring, checking and planning. Participants in the binge-eating group recalled how negative memories affect their cognitions and cognitive processes. The allocation of attention, which was particularly self-focused, was also reported to vary depending upon whether the participant is engaged in a binge eating episode or not.

3.4.2.1 Negative memories triggered.

All participants within the binge-eating group recalled negative memories, particularly of verbal and physical abuse and/or social judgements. This was a very salient feature of all the interviews conducted. The negative memories seemed to be particularly present during binge eating episodes, either being the trigger for an episode or being described as the underlying cause of why binge eating originated as a helpful strategy.

P1: you survive rape, you survive abuse, you survive domestic violence and you eat instead of killing yourself.

P4: three men, must have been in their late 20's came straight up to my coffee table and started shouting abuse at me . . . it was all to do with my weight and no one said a word.

Some participants spoke of how gaining weight through binge eating was originally adaptive as it kept others away, reducing threat, e.g. of sexual abuse. Binge eating had often begun as an adaptive and comforting strategy but had escalated to be the cause of distress, often due to the loss of control experienced and the inevitable consequence of weight gain or lack of weight loss.

P5: When I was 13 one of my parent's friends raped me . . . And I just thought if I ate and ate and ate he wouldn't pester me

P2: I didn't have many friends growing up and I don't have many friends now, and you know food has always been there, food don't look at you and judge you, food don't be horrible to you

Participants described being locked into the negative cycle of binge eating, feeling worse, then bingeing again to manage negative emotions created by the binge episode, without the precipitating factors for binge eating being addressed. The memories recalled by participants were personally relevant and had implications for their well being.

Excerpt from reflective account:

I was really struck and saddened by how vividly every member within the binge-eating group could recall negative memories, particularly around the social stigma of obesity. I felt grateful to the participants for being so open and honest, allowing me to gain an insight into their daily struggles. I also felt a sense of responsibility to actively empathise with them, in the hope that they would understand that not everybody would be judgemental of them. During these moments I often felt torn; I was reassured by my Clinical Psychology training, knowing that I had skills to be able to help contain the participants' distress, but I was also aware that I was not going to meet these participants again and that this research may not help them directly. This left me feeling guilty. I was surprised that despite being aware of this, participants still disclosed information to me that had the potential to make them feel exposed and vulnerable.

3.4.2.2 Selective attention allocation.

Attention, guided by self-knowledge or self-beliefs, is integrally linked to the selection of information for processing and the guidance of behaviour (Wells & Matthews, 1996). The focus of attention reported by participants who binge eat appeared to differ depending upon whether the individual was engaged in a binge eating episode, therefore this theme is divided accordingly.

3.4.2.2.1 During a binge eating episode.

Self-focused attention.

Whilst engaged in binge eating, participants reported that their attention was self-focused on their internal state, i.e. their cognitions and emotions. This focus seemed to be overwhelming and all-consuming. Participants described not being aware of anything in their environment, or the tastes or textures of the food they were eating.

P1: It's more of just gotta have it, gotta have it, gimme gimme gimme gimme and it's really strange because even as I'm eating it I'm not tasting it

P2: I'm just sort of overwhelmed by eating, I can't concentrate on anything else

During a binge eating episode all participants described being in a highly emotional state.

P4: Very often I will be in floods of tears as I am bingeing.

Some individuals described using the binge as a strategy to make themselves feel better and reduce their negative emotions. Consequently, they reported focusing their attention on their emotions so that they could monitor the effectiveness of their binge eating; it was felt that this information would help them know when to stop eating.

P1: it's stuffing down the emotion, you're putting a lid on the emotion by chucking all this food in the way, which is, kind of insane really

P2: how much have I got to eat to make myself feel better?

3.4.2.2.2 Outside of a binge eating episode.

Attend to rumination.

When not binge eating, participants often described focusing their attention on negative, past orientated information in a ruminative nature.

P2: I just think of all the things that have gone wrong in my life like not having a job, not being able to finish college and stuff like that

This is in accordance with research which suggests that self-focused attention may relate to ruminative coping strategies and recycling of negative thoughts, which then hinder the restructuring of dysfunctional self knowledge (Morgan et al., 1995). Rumination is discussed in more detail under metacognitive control strategies (see Section 3.4.3.1) as it transcends the themes of attention and thought control strategies.

Intrusive thoughts.

Attention also seemed to be highly distractible by thoughts of food, which were described as having an intrusive presence.

P3: I would do my work and then all of a sudden the key word would become cake.

It seemed that individuals required high levels of cognitive control to achieve their goals, and that they were prone to distraction and disruption.

Biased attention to others/society.

In situations when binge eating was not involved, participants also reported an attention bias which focussed on others and society. It appeared that they focused their attention towards positive cues about others and negative cues about themselves, including their appearance and behaviour.

P2: Went to me boyfriend sister's wedding, and everyone was in their dresses and I was actually in a dress but I didn't feel quite right, I just, I just felt like a sausage in a dress, I just I, I didn't feel nice you know and everyone else in their slim figures and I'm thinking (sigh) why do I wear a dress when I know I can't look like that

P1: you just absorb it, you learn from society and there is a very negative attitude towards binge eating and you pick that up

Excerpt from reflective account:

When participants spoke of feeling judged by society I felt very conscious of how they may perceive me and whether my body shape or size had an influence on the accounts participants gave. One participant explicitly referred to my body appearance, (I am 5.4ft and a size 10 in clothing) this made me feel uncomfortable and I tried to ignore the comparisons and distinctions made. However, it is important that the differences are recognised and acknowledged. I am aware that it is not possible to rid myself of my attributes and characteristics and that these will have impacted upon the interview process, particularly how participants related to me and the information they disclosed, as well as the conclusions drawn from the data itself.

3.4.3 Theme Three: Metacognitive thought control strategies

The metacognitive thought control strategies used by participants within the binge-eating group included rumination, thought suppression and self-punishment, all of which were included in the a priori themes. Cognitive distraction was however also reported, and so this is a new addition to the final template.

3.4.3.1 Implicit rumination.

Despite all participants seeming to regularly engage in ruminative thinking, it was rarely explicitly described as a thought control strategy that participants actively used. As noted in Section 3.4.1.2 participants held positive beliefs about worry and rumination being adaptive, for example it being able to facilitate reflective problem solving or help prepare for a subsequent event. In addition participants also held contrasting negative beliefs that worry and rumination can cause harm.

The interviews gave the impression that rumination was a thinking style engaged in more frequently than participants may be consciously aware of. This impression was

conveyed through the easy accessibility of information about individuals' internal states, the repetitive, self-focused nature of thoughts, and the high availability of negative memories.

P3: I was always thinking about it (negative memory), playing it over and over

P4: I think things are not that good anymore, I start to spiral down again, and then I am like "hang on" you don't want to be down there.

Participants in the binge-eating group described experiencing high levels of negative affect. The tendency to ruminate appeared to increase negative affect, and in turn increase levels of rumination; paradoxically, this seemed to support the perpetuation of self-discrepancies, prolonging S-REF activity. Intense negative affect and rumination were associated with bingeing acting as a temporary distraction and relief, although this is likely to be fleeting.

*P1: Then it's kind of oh s*** [expletive] what have I done again, why the hell did I do that? ... In the end it hasn't made the thing I'm worrying about go away*

3.4.3.2 Thought suppression.

Within the binge-eating group there seemed a sense of desperation to suppress thoughts, particularly negative memories and cognitions, and also thoughts of food and bingeing. These findings suggest that the binge-eating group is characterised by the persistent recurrence of unwanted thoughts. Suppression took the form of behavioural strategies such as shouting at negative thoughts and self-harm, and internal strategies to mentally suppress cognitions such as the use of self-punishment (see Section 3.4.3.3). This suggests that there are varied and individual differences in the use of suppression strategies.

P3: "forget about it, forget about it, forget about it" and the more I thought forget about it the more I came back and ate more

In accordance with much research into emotional disorders (Purdon & Clark, 2000), the paradoxical effects of thought suppression were not consistently found; i.e. the findings

were mixed, with thought suppression not consistently causing an increased accessibility of the unwanted thought.

One participant recalled how suppression can be associated with the persistent recurrence of unwanted thoughts and memories, and subsequent distress.

P4: "I thought I had locked him [negative memory] away but have realised I hadn't locked him away, he is alive and kicking at certain times in my life at the moment"

However, another participant noted that:

P5: "It takes up energy to fight it [negative cognition], so when I am shouting at it, I am not eating".

These findings suggest that some participants found thought suppression to have immediate benefits; however its success in the longer term may not be maintained. It is not known whether the effectiveness of thought suppression relates to the suppression techniques used, the types of cognitions being suppressed, or whether there is an interacting retrieval bias.

3.4.3.3 Self punishment.

Mental self-punishment was a very prominent feature in all participants in the binge-eating group. Self-punishment was present following a binge eating episode, and there was a sense from all participants that this is how they deserved to feel, and that it was an inevitable and predictable consequence of the binge eating.

P1: I'm a worthless creature anyhow, this is what worthless creatures do

Despite bingeing being a regular behaviour which participants engaged in to moderate their emotional well-being, it seemed that the act of binge eating did not have the desired outcome of reducing negative thoughts and emotions over the longer term; instead it increased negative emotions and cognitions, particularly about the self.

P2: I actually feel worse about myself that I've been on the binge, that I've had to have food to make me feel better

Many participants also considered the act of binge eating itself to also be a form of self-harm and punishment. Participants punished themselves for thinking about binge eating, by binge eating and for having binge eaten. Self-hatred, self-disgust and worthlessness were terms frequently used by binge eaters to describe how they considered themselves, their thoughts and their behaviour.

*P3: I have to deal with the situation that I have eaten it and over 2000 calories in one meal. That's like "oh you're c*** [expletive], you're worthless"*

*P1: it's kind of oh s*** [expletive] what have I done again you know, what, what, why the hell did I do that? . . . In the end it hasn't made the thing I'm worrying about go away but it's yeah, it's a kind of guilt feeling really, it's it's it's a guilt and it's a real discomfort at the idea of the loss of control . . .self-disgust at what I was doing, you know, absolute, ah, self hate,*

P2: I just, I just call myself a useless, fat waste of space

3.4.3.4 Cognitive distraction.

Cognitive distraction, a metacognitive strategy employed to control intrusive and distressing thoughts, was not included in the a priori template. According to the literature on emotional disorders, distraction is classed as an adaptive thought control strategy, which enables thought suppression without the rebound effect (Salkovskis & Campbell, 1994; Wegner et al, 1987).

Distraction and attempts at avoidance were frequently reported by all participants in the binge-eating group. Distraction consisted of focusing attention away from threat or emotion, as a means of avoiding thoughts, feelings and emotions. Distraction was reported as motivated and deliberate, it took large amounts of mental effort, control and planning. Participants reported trying to structure their days, keeping themselves occupied so that it was

harder for them to deviate from their planned schedule. It seemed that if participants were mentally occupied they felt more in control of their emotions and therefore their binge eating. Binge eating is often described as providing a temporary distraction from negative affect (Agras & Apple, 2008). A sense of control was reported as being helpful in reducing the likelihood of a binge eating episode occurring.

P4: I distract myself from it . . . I say I have got to do this, and that, washing and ironing . . . I try to keep myself occupied, some days it is very very hard

P1: If I manage to distract myself I don't feel out of control in the way I would do if I resort to eating and in the end I'll feel I've lost control and you know it saves that emotional, that discomfort for want of a better word, so it's good

The reported success of distraction seemed to be variable within and between participants.

P2: Um, cos sometimes I'm thinking "I hope I don't have a binge, I hope I don't lose control" then I have a binge anyway. Sometimes I don't, cos I can sort of sit there and write a book and then ... read a book, but then a few minutes later after I've done it I'll go on a binge anyway.

3.5 Research Question Two

What are the metacognitive knowledge, processes and control strategies experienced by participants with obesity without binge eating in relation to thoughts about eating?

The a priori themes for the participants without binge eating were less comprehensive than for the binge eaters as the literature suggests that people without emotional disorders experience fewer metacognitions and metacognitive processes. Three main themes and 8 sub-themes were identified in the a priori themes. As before, the a priori themes will not be discussed comprehensively as they constitute the beginning of the analysis.

Figure 4. **a priori themes for participants with obesity without binge eating.**

1. Metacognitive knowledge
    1.1 Positive and negative beliefs about worry
    1.2 High cognitive confidence
    1.3 Little need to control thoughts
2. Metacognitive processes
    2.1 Memories triggered
    2.2 Selective attention allocation
3. Metacognitive thought control strategies
    3.1 Social control / attend to others
    3.2 Distraction
    3.3 Re-appraisal

As noted in question one, the transcripts were coded and the template was modified until the final template was developed. The data supported the inclusion of all main a priori themes; however the subthemes varied, with the modification, inclusion and removal of subthemes. There was one participant (P9) within the non binge-eating group who experienced a range of different metacognitions and used metacognitive control strategies that were different from the other members of this group. Due to the small sample size in this study, the responses have been included in the final template. Consequently some of the sub-themes relate solely to this one participant. This is outlined in further detail within the commentary of the template.

Figure 5. **Final template for participants with obesity without binge eating.**

1. Metacognitive knowledge
    1.1. High cognitive confidence
    1.2. Little need to control thoughts
    1.3. Specific goals
2. Metacognitive processes
    2.1. Memories triggered
        2.1.1. Positive memories
        2.1.2. No memories activated
    2.2. Flexible attention allocation
3. Metacognitive thought control strategies
    3.1. Cognitive distraction
    3.2. Self-punishment
    3.3. Rumination

The final template for participants with obesity without binge eating will now be described in more detail, using illustrative quotes from the anonymised transcripts. These results will be discussed with specific reference to the second research question.

3.5.1 Theme One: Metacognitive Knowledge

Participants in the non binge-eating group did not report either positive or negative metacognitive beliefs and so these were removed as the template developed from the a priori themes.

P6: I don't worry about what it is doing to my body calorie wise, that is the last thing I think about

P7: No, I've never really worried about it [eating behaviour]

It seemed that any concerns, most commonly about the health risks of obesity, were viewed as minor. The concerning thoughts were not considered to have any function, purpose or consequence, and consequently there did not seem to be any associated metacognitions. Consistent with the a priori themes, the non-binge eaters displayed high cognitive confidence and little need to control their thoughts and specific, clear goals.

3.5.1.1 High cognitive confidence.

All participants displayed high cognitive confidence; this was illustrated by the degree to which cognitions guided behaviour. Participants seemed certain in their cognitions, neither questioning nor doubting them.

I: And do you know what kind of thoughts go through your mind ... when you're making that decision as to whether you're going to have some more (food) or not?

P7: Oh yes, yes but it's nothing really definable, I mean I just look at it and think, shall I save it, shall I eat it, shall I save it, oh I'm going to eat it

3.5.1.2 Little need to control thoughts.

Four out of the five participants in the non binge-eating group described their thoughts as merely occurring, they did not express a need to control or monitor them. Often participants were not consciously aware of the content of their thoughts, which seemed to be due to the lack of focus on their thoughts. Participants frequently described their eating as habitual, rather than a considered behaviour.

P8: No no, it is either I have them or I don't

I: It sounds like there are not many thoughts about eating

P6: No, I just do it. Its routine, habit

One participant, was however aware of their thought content and actively attempted to monitor them. P9 thought that this monitoring prevented her from losing control and was the reason why she does not binge eat, despite reporting having never binge eaten.

I: And you are very aware if your thoughts, do you find that you are monitoring them then?

P9: Probably

I: Ok

P9: And that is probably why I don't binge

This response was in contrast to all other participants in this group and may have been affected by a number of variables, for example she was the only female in the non binge-eating group. These variables will be discussed in greater detail in Section 3.5.3.5 and the discussion, Chapter Four, Section 4.2.4.

3.5.1.3 Specific goals.

The goals set by participants in the non binge-eating group were specific and generally had a set time frame e.g. over the work lunch break, making them achievable. The goals also had a clear focus and reason underlying them, and commonly this was health related. In addition there seemed to be little emotion attached to the goals

P8: it's to try and keep off the crisps cos I know they are more fattening

3.5.2 Theme Two: Metacognitive Processes

The metacognitive processes within the non binge-eating group included the recall of positive memories, and attention allocation which was present focused, i.e. on the food or current environment.

3.5.2.1 Memories.

3.5.2.1.1 Positive memories.

The recall of memories within the non binge-eating group was variable. Two participants recalled happy memories; these were associated with comforting food, or food

eaten on happy occasions. These memories were triggered when eating similar food; they also guided food selection due to the positive associations.

P6: Sometimes I think that was a nice piece of beef or ham, I think back to my Nan sometimes when she was alive as we used to have, on Boxing Day we would go to near [local town]and I used to love Boxing Day meals

3.5.2.1.2 No memories activated.

The remaining 3 participants in the non binge-eating group did not recall any memories when they were eating or thinking about food. Participants reported that they were only focused upon the present, their current environment and the taste of food being consumed.

P8: The only thing I can say is some things are nicer than others aren't they, it's not a memory or anything it triggers, it's just "this is nice, I will carry on eating this"

3.5.2.2 Flexible attention allocation.

In contrast to the a priori theme which indicated that attention would be selectively allocated, the allocation of attention seemed to be flexible. When there were few environmental stimuli, participants in the non binge-eating group consistently described their attention as being focused upon the food they were eating, however the focus adapted according to salient aspects of the environment. Again, this was not reported as a conscious effort, but more as a natural response to stimuli.

P9: When I am eating I am aware of food, I am aware of the taste the aroma I'm aware of the textures

P6: The only thing I think is "I like this".

P8: Not getting it down me shirt, that's the main thing or the TV when I'm at home . . . I don't really pay attention to anything

3.5.3 Theme Three: Metacognitive Thought Control Strategies

This theme did not present as expected; metacognitive thought control strategies were mostly difficult to identify or did not appear to exist in the non-binge eaters. As analysis progressed this theme was modified considerably from the a priori themes; social control and re-appraisal were removed, and rumination and punishment were introduced. Although it is important to note that the subthemes introduced (rumination and punishment) were only reported by one participant (P9). The only consistent strategy was cognitive distraction which was widely reported by all participants in the non binge-eating group.

3.5.3.1 Social control.

It was expected that participants in the non binge-eating group would use social control, i.e. attending to others, as a thought control strategy, however this was not found in the interviews conducted. Participants did describe how their eating behaviour was guided by whether they felt others would judge them, particularly the quantities of food participants ate in front of others, however they were not used metacognitively to control their thoughts.

P6: I like cod and chips from the chippy sometimes, we don't have that much now as my wife said I had too many chips.

P8: I don't want to look like a pig in front of them, if you see what I mean.

The lack of metacognitive social control did not seem to be because of a wish to not disclose thoughts to others, or an avoidance of discussing them, more that metacognitive beliefs were not identified within the interviews and that participant's thoughts were not of a nature which needed controlling in this way.

3.5.3.2 Re-appraisal.

None of the participants in the non binge-eating group recalled using re-appraisal as a thought control strategy. Despite reporting that their eating behaviour was bad for their health, participants did not try to re-interpret or question the validity of their cognitions.

Participants commonly justified their eating behaviour, but the justifications were not of a metacognitive level.

P10: I'm still in the old habit or routines of what I did before. You know.

P6: I was brought up not to waste anything you know, can't waste food

P8: I know I shouldn't really but one more won't hurt this time, there is always tomorrow, I can give it up tomorrow. But tomorrow never comes.

3.5.3.3 Cognitive distraction.

Cognitive distraction was a common technique used by participants in the non binge-eating group to exercise control over their cognition. Distraction was portrayed as a helpful strategy, which participants actively engaged in. Participants reported using distraction as a method to occupy their mind, with the goal of reducing their negative thoughts or thoughts about eating. This was particularly prevalent when eating was considered a habitual behaviour to fill spare time, rather than being due to hunger. Engagement in this strategy suggests that participants did not perceive themselves to be helpless and were motivated to reduce any discrepancy between their current self and their goal status; however distraction was not always considered successful, with (habitual) thoughts of eating still being intrusive.

P8: I think about cars or something,. . . to take your mind off it . . . but it is too easy just to, another 50p in the machine and a packet of crisps like.

P9: Yeah I try to think of something positive in terms if when I am going down that loop of negative thinking, I probably go to fantasy

3.5.3.4 Self punishment.

This was not included in the a priori theme as the literature consistently identifies self-punishment as a maladaptive thought control strategy. It is noteworthy that self-punishment was only reported by one participant in the non binge-eating group. This participant reported engaging in self-punishment frequently, not just around thoughts of eating.

P9: the thought pattern generally is that I am a waste of space really, that I will never be good enough,

Two other participants described fleeting thoughts of regret after eating but not to the extent that they would mentally punish themselves.

P8: I suppose you feel bad afterwards for eating it but I don't think I beat myself up

P7: I just think I really shouldn't have eaten that, but 2 hours later I'll have a bowl of cereal

3.5.3.5 Rumination.

Rumination was also not included in the a priori themes but was reported by one participant. P9 described how her thoughts become repetitive and negative, and there was a sense that this was considered unhelpful rather than a deliberate thought control strategy.

P9: I get in that negative funnel you know . . . where one negative thoughts leads to another and sort of daisy chains down into another . . . sometimes just acknowledging that you are funnelling down, that is the process that is happening with you, that can sometimes be enough to stop it.

As with punishment, this participant did not only engage in rumination in relation to thoughts about eating and food. It is interesting that this participant was able to recognise when she was ruminating and that she was often able to stop the ruminative process using other, more adaptive thought control strategies. Consequently rumination in this participant had a controllable quality.

It is important to note that this is the same participant (P9) who reported engaging in self-punishment and attempts to monitor her thoughts. There are a number of differences between this participant and all others in the non binge-eating group; P9 is the only female in the non binge-eating group, she reported engaging in physical self-harm and previous suicide attempts. Her BMI was high and her score on the MCQ-30 was the highest in the non binge-eating group. Her occupation also requires significant self-reflection and so she may have

greater self-awareness than many of the other participants. It is possible that these factors are confounding her presentation in comparison to the other members of the non binge-eating group.

Excerpt from reflective account:

During the interview with this participant I was very aware that the content and style of her answers were in stark contrast to the other non-binge eaters. I found myself considering whether there may be other interrelated factors influencing her. This curiosity led me to ask further questions as I considered whether she was depressed, whether she was influenced by her gender or profession, which required a large amount of self-insight, or whether she was in fact a binge eater but did not wish to disclose this. I wanted to understand what made her different and had to struggle to keep an open mind and not get drawn into thinking about how her responses were biasing the template in an unanticipated direction, a thought which had the potential to be frustrating.

3.6 Research Question Three

What are the similarities and differences between the metacognitive knowledge, processes and control strategies experienced by participants with obesity with and without binge eating in relation to thoughts about eating?

Overall, this research illustrates that participants from the binge-eating group differed from the non binge-eating group on several dimensions of metacognition. This section will explore the similarities and differences between the metacognitive knowledge, processes and control strategies experienced by participants with obesity with and without binge eating in relation to thoughts about eating. To enable this comparison the two templates will be examined and compared, any similarities or differences will be reported. Metacognitive

knowledge will be examined first, followed by metacognitive processes and then metacognitive thought control strategies. This section concludes with a short summary of the overall results.

3.6.1 Metacognitive knowledge

3.6.1.1 Metacognitive beliefs.

The non binge-eating group did not report any metacognitive beliefs; this is in stark contrast to the binge-eating group who reported both positive and negative beliefs. Participants in the binge-eating group held positive metacognitive beliefs, demonstrating that they believed there were advantages to worrying about bingeing. Advantages were functional and related to the maintenance and restoration of one's emotions and cognitions, enabling problem solving. They also held negative beliefs about their cognitive processes in terms of uncontrollability of these mental events, but also in terms of the harmful consequences (e.g. binge eating, guilt, shame etc) that might follow from having specific thoughts. Participants in the binge-eating group also reported holding both positive and negative beliefs simultaneously.

3.6.1.2 Cognitive confidence.

Participants in the binge-eating group also demonstrated low cognitive confidence in comparison to the non binge-eating group; they reported a lack of trust in their thoughts and a sense of having lost control over their cognitions. Such concerns were not reported by any members of the non binge-eating group, all of whom were certain in their cognitions, allowing them to translate into judgements and guide behaviour in a way that was unquestioned. Research shows that cognitions held with greater confidence tend to cause people to be more resistant and behave in a more consistent, predictable and stable way (Rucker & Petty, 2004; Tormala & Petty, 2002). Therefore, it is possible that low cognitive

confidence may be associated with unstable and unpredictable behaviour, such as binge eating.

3.6.1.3 Cognitive self-consciousness.

With the exception of one participant in the non binge-eating group, the data suggest that binge eaters display heightened cognitive self-consciousness in comparison to non-binge eaters. They expressed a greater awareness of their mental processes and a need to monitor, evaluate and control their thoughts. The heightened cognitive self-consciousness seemed to be accompanied by a sense of desperation and urgency to understand and control one's cognitive processes to avoid the possibility of binge eating.

3.6.1.4 Goals.

The nature of the metacognitive goals also differed between the two groups. Goals were specific and achievable in the non binge-eating group. In contrast, participants in the binge-eating group rarely defined their goals, they were often unsure what they were or they were inconsistent. Consequently, participants could not appraise whether they had been successful in achieving their goals. This seemed to frequently be associated with a negative emotional response (e.g self-disgust and worthlessness), which suggests that the S-REF is active, the self-regulatory goal has not been met and therefore the dissonance between one's current and desired state is not resolved.

Overall, participants in the non binge-eating group seemed to exhibit less metacognitive knowledge and appraisals. Metacognitions are most pronounced under high thinking or emotionally relevant conditions. It seemed that participants in the non binge-eating group had few thoughts about their eating behaviour and eating appeared to be described as more habitual in nature. Therefore, non-binge eaters were operating in low elaboration conditions and so S-REF activity was minimal, consequently they were less

attentive to their own cognitive processes. In contrast, the binge-eating group were highly emotional, and eating was a particularly salient topic.

3.6.2 Metacognitive processes

3.6.2.1 Memories.

The recall of memories was a salient feature of all interviews in the binge-eating group, and the most striking difference between the binge eaters and non binge eaters. All participants within the binge-eating group recalled negative memories; these were recalled in great detail and were highly emotive. The memories were recalled throughout the interviews, often prior to questioning and before prompting. The memories seemed to be all encompassing and overwhelming, affecting the participants on a daily basis. They were often described as the reason why a participant first began binge eating, (for example to gain weight and keep others away), and were often recalled as both the trigger and consequence of binge eating episodes. The memories appeared to have an intrusive nature.

In contrast, the non-binge eaters could either not recall any salient memories, or when prompted recalled vague memories of positive experiences of eating, for example one participant fondly remembered their meal at a family celebration. It is not known whether the participants in the non binge-eating group have not experienced such negative events, or whether they were not as focused on their internal mental processes and memories.

3.6.2.2 Attention.

The two groups of participants displayed contrasting attentional styles. A clear difference between the two groups is that participants in the non binge-eating group focused their attention on a wider variety of stimuli; internal, external, positive, negative and neutral information, for example on the taste of the food they were eating or on stimuli in their environment.

The attention style reported in the binge-eating group seemed to be more rigid and self-focused. The focus was determined by their cognitive and emotional internal state rather than environmental stimuli. Interestingly when binge eating, participants' attention was intensely self-focused, monitoring their emotional state rather than the taste or texture of the food they were consuming. Participants in the binge-eating group appeared to selectively attend to information which was negatively biased. Their attention was focussed on processing threat-congruent information and self-focused worry.

3.6.3 Thought control strategies

The theme, thought control techniques, showed the greatest deviation from the a priori themes, and illustrates several differences between the binge eating and the non binge-eating groups. As mentioned previously, the results from the non binge-eating group include one participant who differed considerably from the other members of this group.

In general, the reporting of thought control strategies varied in content and depth of descriptions. This is in accordance with the group differences in the "need to control thoughts" and "cognitive self-consciousness" subthemes. The binge-eating group emphasised the importance of controlling their thoughts to a greater extent than the non-binge eaters. The descriptions of attempts to control thoughts were described with more urgency and negative affect, and the consequences of failing to control thoughts were viewed as more severe, having a negative impact on individuals' emotional and physical well being and sense of self. Interestingly the non-binge eaters did not report engaging in thought control techniques which have been previously hypothesised as helpful, i.e. re-appraisal and social control. This may be due to their lack of metacognitions and a consequent reduced need for such techniques to be employed.

Overall the only thought control technique which was reported by all participants in both groups was cognitive distraction. This was an unexpected result as distraction had not

been included in the a priori template for the binge-eating group as previous research associated it with emotional adaptation. There were however, qualitative differences in the nature and implementation of distraction between the two groups. Within the binge-eating group, distraction was a structured process which required large amounts of mental effort, planning and control. Through describing their distraction techniques participants illustrated the extent to which they attempted not to binge eat and the cognitive struggles that this entailed. The binge eaters also seemed to adopt distraction in a less flexible manner, for example if one distraction technique failed a full binge eating episode would occur, rather than another distraction technique being adopted.

3.6.3.1 Rumination.

Rumination occurred in the binge-eating group, but was only reported by one member of the non binge-eating group (P9). When present, rumination seemed to dominate the interviews and was obviously apparent to the interviewers. Rumination presented as a general thinking style, relating to many aspects of individuals' lives, rather than being specific to thoughts about food and eating. It was often not reported as a feature that individuals were actively aware of or deliberately adopted. When participants ruminated, the interview content was more negative, brooding and past focused, emphasis was particularly placed on negative memories. In comparison, when participants did not ruminate, the interview content was lighter, more current and future orientated, and had a less personal atmosphere. It is interesting that when participants recognised that they were ruminating they judged this as unhelpful and made attempts to stop, regardless of whether they held positive beliefs about rumination.

3.6.3.2 Self-punishment.

Similarly, self-punishment was widely reported in the binge-eating group, but only by one member of the non binge-eating group (the same individual, P9). Self-punishment was

reported as a metacognitive strategy as well as a behavioural strategy, with participants also reporting the use of physical self-harm. It is noteworthy that the one participant in the non binge-eating group (P9), also reported physical self-harm. She was the only member of the group that did so, and so there may be a link between the use of physical, cognitive and metacognitive self-punishment. Other than P9, participants in the non binge-eating group did not seem to have contemplated self-punishment. Non-binge eaters reported feeling occasional regret after eating, but this was not to the same extent of the binge eaters who commonly reported self-hatred, self-disgust and worthlessness.

3.6.3.3 Thought suppression.

Thought suppression was the only technique that was only reported by those in the binge-eating group. The use of thought suppression suggests that the binge eaters were disturbed by the content or nature of their thoughts and wished to them to stop. In contrast, those in the non binge-eating group did not report thought suppression. It is possible that the non-binge eater's cognitions may not be so negative or intrusive.

3.6.4 Results Summary

The results have been divided into themes for ease of understanding and reporting, however it is important to note that the themes are interlinked. In sum, binge eaters displayed a cognitive style that was characterised by greater metacognitive judgements. They expressed a lack of trust over their own thoughts; thoughts were considered as dangerous, uncontrollable, and were particularly associated with causing the individual harm. In contrast, thoughts were also considered as functional in the regulation of emotions and cognitions, and enabling cognitive control. All participants that binge ate displayed an increased attentional focus on internal mental processes and a sense of reduced control over their own mental activities. Participants in the binge-eating group reported being in a constant battle with their cognitions, using more thought control strategies. The thought control strategies adopted by

participants in the binge-eating group were rumination, self-punishment, thought suppression and cognitive distraction. These are mostly considered to be maladaptive and seemed to have minimal positive effect, with the exception of cognitive distraction. Overall, the non-binge eaters held fewer metacognitions and were more confident and trusting in their cognitions, allowing them to guide their judgements and behaviour. With the exception of one participant, they engaged in fewer thought control techniques and experienced less mental distress.

Chapter Four

Discussion

4.1 Introduction to Section and Overview

This chapter begins with a discussion of the results in relation to the research questions, theoretical models and previous research findings. A critique of the methodology is presented; strengths and limitations of the study will be considered with specific reference to the research design, recruitment, sample, measures, procedure and analysis. Theoretical and clinical implications of the study will be examined, and directions for future research are proposed. Lastly, the conclusion will summarise the salient points of the research process.

4.2 Discussion of Research Findings

This section begins by outlining the sample in terms of demographics and scores on the self-report measures. The research findings will then be discussed with reference to current relevant literature and theoretical models, particularly with regard to the Self-Regulatory Executive Functioning model (S-REF; Wells & Matthews, 1994, 1996). The results are structured in accordance with themes identified by the template analysis and end with a consideration of additional findings.

4.2.1 Sample Characteristics

With the exception of gender, there were no obvious demographic differences between the two groups. The binge eaters' scores on the EDE-Q (Fairburn & Beglin, 1994**)** were more likely to indicate clinical severity, compared to the non binge-eating group. On the MCQ-30 (Wells & Cartwright-Hatton, 2004) the binge eaters reported a more maladaptive metacognitive style. The TCQ (Wells & Davies, 1994) results indicated that the binge-eating group engaged in greater attempts to control their thoughts, particularly through the use of self-punishment. The scores on the HADS (Zigmond & Snaith, 1983) suggested that the binge-eating group may experience greater anxiety and depression in comparison to the non

binge-eating group, although overall the scores for the non-binge eating group were above those expected within a healthy population.

It is also noteworthy that P9, the only female participant within the non binge-eating group, reported higher scores on the TCQ and the MCQ-30 than the other participants in the non binge-eating group.

4.2.2 Theme One: Metacognitive Knowledge

Findings from both the Metacognitive Profiling Interview (Wells, 2000) and the MCQ-30 (Wells & Cartwright-Hatton, 2004) indicated that metacognitive knowledge was more prominent within the binge-eating group than the nonbinge-eating group. In general, the non-binge eaters were found to have fewer thoughts about eating. If one has few or no thoughts, then their metacognitions and metacognitive processes are likely to have little impact (Briñol, Petty, & Rucker, 2006). Within the binge-eating group, binge eating appeared to be a more personal and emotionally salient topic. Personal involvement is hypothesised to increase thought elaboration (Petty & Cacioppo, 1979), and therefore caring and thinking about one's thoughts. It is therefore likely that the binge-eating group generated more thoughts and so higher levels of metacognitions and metacognitive processes were found to operate. This is consistent with both metacognitive research and the S-REF model which suggests that higher metacognitive activity is associated with personally significant information and the development and maintenance of emotional disorders.

4.2.2.1 Metacognitive beliefs.

The binge-eating group endorsed both positive and negative metacognitive beliefs. Positive beliefs reflected the functional aspect of using food to regulate negative states and maintain cognitive control. Negative beliefs centred on uncontrollability and harm. According to the S-REF model these metacognitive beliefs exist as implicit plans linked to self-regulatory processing (Wells, 2000). In response to a stimulus, these plans direct the

activity of the controlled processing system that includes memory retrieval, selective attention and metacognitive processing (Wells & Matthew, 1996). These findings support the S-REF model prediction that metacognitive beliefs are associated with vulnerability to, and the maintenance of, psychopathology, as well as behavioural features of psychopathology. These findings are also in accordance with research that has studied metacognitions in other eating disordered behaviour and psychopathology. Cooper et al. (2007) reported that females with anorexia nervosa had significantly higher metacognitive concerns, indicating higher levels of uncontrollability and danger, than dieters and non-dieters, when measured using the MCQ-30 (Wells & Cartwright-Hatton, 2004). These results are also in line with the findings of Caselli and Spada (2010) who used the Metacognitive Profiling Interview (Wells, 2000). Caselli and Spada found that participants with a diagnosis of bulimia nervosa (BN) endorsed both positive and negative metacognitive beliefs; similarly, positive metabeliefs concerned usefulness, and negative metabeliefs concerned uncontrollability.

These findings support the notion that individuals can assess their evaluation of their thoughts, e.g. as good, bad, desirable or hindering (Briñol, Petty, & Rucker, 2006). The metacognitive evaluation of a thought as harmful or uncontrollable might negatively influence a person's overall emotional experience. For example a negative emotional thought that is evaluated as out of control is likely to be threatening to one's self-regulation. However, if the thought is evaluated as being acceptable and under control it is likely to be less detrimental to self-regulation and therefore well being (Briñol, Petty, & Rucker). Co-occurring positive and negative beliefs may be most dysfunctional due to their conflicting nature (Cooper, Wells, & Todd, 2004). Individuals may be fearful of the impact of binging on their cognitive-emotional functioning and its uncontrollability (negative metacognitions) but feel they must binge in order to control cognition and emotion (positive metacognitions), which then exacerbates the negative metacognitions. Therefore the presence of both positive

and negative beliefs in binge eating may be an important contributory factor to the maintenance of S-REF activity, possibly leading to cognitive dissonance and cognitive attentional syndrome (CAS; Wells, 2000).

The similarities between the current findings in relation to the binge-eating group of obese participants and research in other eating disorder populations suggest there may be an overlap in the metacognitive profile of those who display maladaptive eating behaviours. These finding are also compatible with the Cooper et al. (2004) model of BN, which proposes that exposure to a trigger for eating can result in both positive and negative beliefs about eating. These beliefs compete with each other, creating cognitive dissonance. In this model conflict is resolved through permissive thoughts that give rise to maladaptive eating behaviour (Cooper et al., 2004)

The prominence of metacognitive judgements and beliefs is also consistent with research investigating other psychological disorders e.g. depression (Papageorgiou & Wells, 2001, 2003), generalized anxiety disorder (Cartwright-Hatton & Wells, 1997; Wells & Carter, 2001), obsessive-compulsive symptoms (Wells & Papageorgiou, 1998; Emmelkamp & Aardema, 1999) and PTSD (Reynolds & Wells, 1999). These results, when embedded within the current literature, support the notion that the S-REF model and concept of metacognitions may have transdiagnostic relevance.

4.2.2.2 Cognitive confidence.

Cognitive confidence refers to the evaluation of one's own cognitive functioning and cognitions held with more confidence are said to have a greater impact upon judgements (Petty, Brinol, & Tormale, 2002). Therefore those thoughts that are held with high confidence tend to be more consequential for subsequent stability, resistance and prediction of behaviour (Rucker & Petty, 2004; Tormale & Petty, 2002). Conversely, the S-REF model proposes an association between low cognitive confidence, thought instability and emotional disturbance.

The findings from the current study that participants in the binge-eating group displayed lower confidence in their cognitive abilities compared to the non binge-eating group is in concurrence with the predictions from the S-REF model. Appraisals of low cognitive confidence, such as being unable to cope effectively, are likely to generate worries and thoughts that will interfere with cognitive processing for example through reduced capacity. This will cause unstable, maladaptive cognitions and emotions to persist. If one has unstable, maladaptive cognitions and emotions, it is likely that they may also present with unstable, maladaptive behaviour, such as binge eating. It is possible that the presence of conflicting positive and negative beliefs may compromise confidence in cognitions, as there is a lack of consistency and what appears to be a battle of competing, contrasting beliefs. However, it is also possible that these findings may reflect an actual impairment or cognitive deficit, rather than inaccurate metacognitive appraisals, as has been shown in research with severely depressed individuals (Slife & Weaver, 1992).

4.2.2.3 Cognitive self-consciousness.

The binge eaters also displayed heightened cognitive self-consciousness, unlike the non-binge eaters. Cognitive self-consciousness may make individuals more vulnerable to the development and maintenance of emotional disorders because it may increase the detection of unwanted target thoughts, trigger intrusions, make negative thoughts more salient and increase the probability of dysfunctional thought appraisal (Wells, 2000). Increased cognitive self-consciousness also draws on the limited resources of controlled attention and therefore may disturb the monitoring of oneself in relation to goals and effortful cognitive tasks such as problem-solving. The S-REF model proposes that individuals with emotional disorder are "locked into" cycles of maladaptive self-processing, with consequent loss of resources and impaired flexible control over processing. This process was illustrated clearly by participants in the binge-eating group who were unable to find answers when questioning their cognitions.

4.2.2.4 Goals.

In comparison to the obese non-binge eaters, the obese binge eaters reported unrealistic, poorly defined or an absence of goals. As noted previously, the S-REF is activated to restore discrepancies between an individual's desired and actual state. Typically, episodes of the S-REF are of short duration as the person is able to select a coping strategy that successfully deals with the inadequacy appraised, either through task-focused external action or through emotion-focused modification of beliefs.

Many participants in the binge-eating group reported that they were unable to achieve their self-regulatory goal. Failure to achieve goals may be linked to the selection of inappropriate coping strategies, repeated negative appraisal of one's current state based on negative self-knowledge, the existence of unrealistic goals for self-regulation, or external constraints that compromise discrepancy reduction (Wells, 2000).

All participants in the binge-eating group expressed higher levels of emotional distress than the non binge-eaters. According to the S-REF model, emotional responses only occur when the S-REF is active. The S-REF is deactivated when individuals assess that the goal has been successfully achieved (through alternative goals and plans for processing).Therefore emotional responses indicate the status of the S-REF model (Oatley & Johnson-Laird, 1987), i.e. that the self-regulatory goal may have not been met.

4.2.3 Theme Two: Metacognitive Processes

4.2.3.1 Memories.

All participants within the obese binge-eating group recalled negative memories; often these had either an intrusive, overwhelming quality or were ruminative in nature. The memories were personally relevant and very distressing for participants and would therefore be likely to activate the S-REF configuration to restore self-regulation. Such activation may affect the sensitivity of the processing system to monitor for the memories (Wells &

Matthews, 1996). Increased monitoring may prime representations making intrusion of the memories more likely. Priming also increases the sensitivity of processing units for particular types of activity which are congruent with the target stimuli (memories). Worrying about and dwelling on memories may elaborate their representations so that they are subsequently activated by a greater range of triggers (Wells & Papageorgiou, 1995).

The continuation and persistence of these memories may be indicative of poor emotional processing, as this indicates that S-REF activity is perseverative suggesting there is an ongoing discrepancy in self-regulation. Emotional processing may be prevented by the coping strategies adopted and the high arousal experienced.

For the participants in this research, binge eating was an active coping plan that had provided comfort in the past. As noted in Section 3.4.2.1 participants reported that this had subsequently become established as a method for dealing with threat. Binge eating is associated with cognitive avoidance, diverted attention and maladaptive coping strategies (Ainsworth, Waller, & Kennedy, 2002; Kelly, Lydecker, & Mazzeo, 2012). Therefore participants who binge eat may not have emotionally processed their traumatic memories and so the memories may persist, the self-regulatory goal may not be met and emotional distress continues.

In contrast, the positive memories activated in binge eaters did not cause emotional distress or need regulating and so the CAS was not activated. This is consistent with the S-REF model since only situations which impinge on self-regulation are considered to activate dysfunctional processing (Wells, 2000).

4.2.3.2 Attention.

Participants in the obese binge-eating group reported attention biases towards threat congruent information and internal negative information, such as emotions and memories. Attention was largely self-focused during binge eating episodes. In contrast, non binge eaters

reported focusing upon either their food or environmental stimuli, demonstrating a more flexible focus of attention. Attention can bias the retrieval of knowledge and restrict the flow of information into processing, therefore influencing processing priorities (Wells & Matthews, 1996). The binge eaters' focus upon threat may strengthen danger-related beliefs, making it harder to disconfirm over-predictions of danger, causing threat monitoring to continue. Threat monitoring can prevent disconfirmatory information being processed and therefore S-REF processing, negative affect and cognitions continue.

Wells (1990) noted that an internal focus of attention, as reported by the binge eaters may heighten awareness of dissatisfaction with the self, engendering negative cognitive activity. The consequential emotional responses become the focus of S-REF activity. Within the S-REF, attentional control draws on limited cognitive resources; it is possible that when participants are experiencing intense emotions, i.e. during a binge eating episode, the strength of emotions may exceed the capacity for attentional control over cognitions and emotions (Mathews & MacLeod, 2005). This may result in participant's focus of attention becoming stuck as they have less capacity and resources to control their attention. This focus on threat, negative cognitions and one's emotional response may then cause the emotions to persist. This could explain why attention control seemed to vary depending upon whether an individual was engaged in a binge eating episode or not and why participants' attention was compromised particularly when in a highly emotional, binge eating state. This in turn can contribute to the maintenance of S-REF configuration, contributing to CAS (Wells, 2000) and therefore emotional dysfunction, causing binge eating episodes to re-occur and persist.

4.2.4 Theme Three: Thought Control Strategies

In the S-REF model, thought control strategies originate from metacognitive beliefs that endorse them as helpful for coping and self-regulation (Wells and Matthews, 1994, 1996). For example, a positive belief that rumination helps maintain cognitive control makes

it likely that it will be adopted as a thought control strategy. Consequently the finding that participants who held more metacognitive beliefs, (the binge eaters), also held more maladaptive thought control strategies, is also in accordance with the S-REF model.

Rumination, self-punishment and thought suppression are all hypothesised to be unhelpful thought control strategies that can lead to CAS (Wells, 2000) and thus contribute to the onset and maintenance of emotional disorder and relapse. Participants in the binge-eating group were more likely to use thought control strategies which increased their negative thoughts or emotions, and were less successful at using strategies which may challenge their thoughts. This finding is similar to research by Woolrich, Cooper, and Turner (2008) who demonstrated that patients with anorexia nervosa were significantly more likely to use thought control strategies than dieters and non-dieters, particularly punish self mentally, distraction, thought suppression, rumination and avoid triggers. They were less successful at using re-appraisal, attending to body and attending to others.

4.2.4.1 Rumination.

The current findings indicate that participants in the binge-eating group demonstrate a tendency for perseverative cycles of rumination. The non-binge eaters did not report rumination. It is hypothesised that rumination interferes with self-regulatory processing in several ways; rumination withdraws attention from external stimuli and diverts it towards internal thoughts, this prevents the provision of new information which may disconfirm negative beliefs or appraisals. Rumination also uses up valuable processing resources; it prolongs self-focussed processing and may bias or disrupt other operations, such as emotional processing, contributing to cognitive inefficiency (Wells, 1994; 2000). Therefore rumination perpetuates maladaptive thoughts and emotions, causing CAS to operate, preventing the restoration of normal functioning.

The finding in the current study that the binge-eating group used rumination as a general thinking strategy not specifically related to triggers for binge eating, differs from the ruminative processes described by Cooper et al. (2000, 2004) for individuals with BN. Cooper et al. found that participants with BN only ruminated when exposed to self-referent situations related to eating. The difference in the two findings may be related to the purging or compensatory behaviours in BN or to BMI. The notion that those with more dysfunctional presentations engaged in greater rumination is supported in a range of disorders (for example, Papageorgiou & Wells, 2001a & b; Papageorgiou, Wells, & Meina, 2001; Woolrich, Cooper, & Turner, 2008).

4.2.4.2 Thought suppression.

In accordance with the S-REF hypotheses, thought suppression was only reported by the obese binge eaters, suggesting it is associated with dysfunctional behaviour and emotional disorder. The S-REF model proposes that suppression activates the monitoring plan that searches for instances of the intrusion in order to test that the suppression goal has been met. Monitoring is hypothesised to increase the likelihood of activating the unwanted thoughts as the lower level processing units become hypersensitive to intrusive thoughts and symptoms which signal the need for self-regulation and coping (Wegner & Zanakos, 1994; Wenzlaff &Wegner). However, the reported success of thought suppression as a thought control strategy in the current study was mixed and so the findings only partially support S-REF proposal.

The varied success of suppression as a thought control strategy is a common research finding (Purdon & Clark, 2000). To date previous research has been unable to identify the factors which may influence the success of suppression as a thought control strategy. More research is needed to understand the nature and effects of thought suppression. These results do however, indicate that obese binge eaters experience a greater need to reduce distressing

thoughts than non-binge eaters, and that a number of different behavioural and cognitive strategies (e.g. shouting and mental self-punishment) may be used in an attempt to suppress thoughts.

4.2.4.3 Punishment.

Self-punishment was widely reported in the binge-eating group. In the field of metacognitive research, self-punishment has been associated with emotional vulnerability and psychopathology. Self-punishment has been conceptualised as a technique used by individuals to attempt to suppress unwanted thoughts (Wells & Davies, 1994), and so it is notable that it was generally the same participants who used suppression who also enforced punishment. Self-punishment appeared to perpetuate distress, indicating ongoing S-REF activity and a discrepancy in self-regulation. It was also reported that binge eating itself was a form of behavioural self-punishment. These findings are in accordance with other research which links punishment with disordered eating patterns (e.g. Woolrich, Cooper, & Turner, 2008). Self-punishment and rumination have been identified by previous research as the strongest indicators of eating disorders, when assessed using the TCQ (Wells & Davies, 1994) (Behrad & Kamali, 2011). When viewed together the excessive use of punishment, suppression and rumination seem to preserve unhelpful cognitions and distress associated with intrusive thoughts. This evokes increased attempts to suppress the thought, which often fail, resulting in a greater frequency of the thought, greater emotional distress and more preoccupation with the thought. Consequently, these thought control strategies may contribute to the maintenance of binge eating in an attempt to both regulate emotions and punish the individual.

4.2.4.4 Threat monitoring.

Threat monitoring was not reported and so was removed from the template. However, the binge eaters did report an attentional bias towards negative cues, memories and social

stigma as demonstrated in Section 3.6.2. This suggests that threat monitoring may have occurred but not as an explicit thought control strategy. These attentional priorities may repeatedly activate and refresh the concept of threat appraisals, continuing S-REF activity and perseverative coping strategies. These negative consequences may be comparable to those of using threat monitoring as a thought control strategy.

4.2.4.5 Distraction.

Distraction is considered an adaptive metacognitive control strategy (Reynolds & Wells, 1999; Selby, Anestis, & Joiner, 2008), and so was only included in the a priori template for the non binge-eating group. It was however, widely reported by participants in both groups, although as noted in Section 3.6.3 there were qualitative differences in the nature of distraction and its success, for example participants in the binge-eating group required greater planning to implement distraction compared to the non-binge eaters. The S-REF model proposes that distraction can temporarily suspend S-REF activity through the diversion of attention away from negative, perseverative activity. Distraction may be a more successful technique for participants in the non binge-eating group as their lower level activity may be less intrusive. In emotional disorders, S-REF activity resumes after distraction ceases as a result of the incompletely executed plans, as it is motivated by the discrepancy between the current self and the goal status. When considering the S-REF model and CAS, it is possible that distraction primes alternative stimuli, making the target suppressed thought less accessible and therefore less intrusive. Therefore the use of distraction may be another interrelating factor which affects the success of thought suppression.

4.2.4.6 Social control and re-appraisal.

Social control and re-appraisal were not reported by participants in the non binge-eating group despite being widely theorised as helpful metacognitive thought control

strategies (Reynolds & Wells, 1999; Selby, Anestis, & Joiner, 2008). This may relate to the negative social stigma surrounding obesity (Wang, Brownell, & Wadden, 2004), which was commonly reported in the interviews. Stigma may reduce people's desire to speak openly about their obesity and eating behaviour. Alternatively, it may be that participants in the non binge-eating group experience very few metacognitions and so feel little need for control strategies. However, this hypothesis seems less likely as the non binge-eating group reported the use of distraction. Another possible explanation is that adaptive strategies might have weaker associations with psychopathological symptoms because they are more context-dependent than maladaptive strategies. For example, reappraisal might only be adaptive when the situation can be reframed, whereas rumination is maladaptive most of the time (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). This hypothesis is supported by research which suggests that the adaptive metacognitive thought control strategies have a smaller role in cognitive emotion regulation than maladaptive strategies (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

4.2.5 Additional Findings

A number of qualitative differences were observed between the interview styles of the participant groups. The binge eaters' responses were more emotionally based; their answers were generally greater in depth and length, and their expressed emotion much higher. The responses of the non-binge eaters tended to be more practical, obesity and eating seemed to be a less emotionally-salient topic, and the interviews were generally shorter.

However, one participant (P9), in the non binge-eating group had a very different presentation; she presented more similarly to the participants in the binge-eating group. As noted in Results Section 3.5.3.4, her presentation may have been affected by a number of possible confounding variables. P9 was the only female in the non binge-eating group, she reported engaging in physical self-harm and previous suicide attempts. Her BMI was high

and her score on the MCQ-30 was the highest in the non binge-eating group. She was the only non-binge eater to have previously received hypnotherapy for her obesity. Her occupation also required significant self-reflection and so she may have greater self-awareness than many of the other participants. Another possible explanation is that P9 presents with a different emotional disorder which may share similar metacognitive beliefs and processes e.g. depression. (Papageorgiou & Wells, 2003). Further research is needed to explore the similarities and differences between the metacognitive profiles of different emotional disorders, and to understand why one individual with similar metacognitions may present with a different emotional disorder to another individual.

4.3 Methodological Critique

Within this section, the current study is appraised in terms of its research design, recruitment strategy, sample population, measures used, procedure and analysis.

4.3.1 Design

This study adopted a cross-sectional sequential mixed-methods design, consisting of qualitative and quantitative methods. Emphasis was placed upon the qualitative research as the study of metacognitions in binge eating and obesity is a novel area and so a rich understanding of the complexities was sought. The quantitative self-report questionnaire data was used to contextualise the qualitative findings and enable them to be considered in line with other comparable research studies. Qualitative and quantitative methods were thought to be compatible because they share the goal of understanding and disseminating knowledge, and a commitment for rigour, conscientiousness and critique in the research process (Reichardt & Rallis, 1994). It has also been noted that complex phenomena require the use of broad spectrum qualitative and quantitative methods (Baum, 1995). Mixed-method designs also enabled different data sources to be triangulated to gain a more complete understanding (Denzin, 1970).

However, mixed-methodology is not without criticism. It has been suggested that the two approaches come from different ontological and epistemological positions. Quantitative researchers perceive truth as an objective reality, qualitative researchers are concerned with the changing nature of reality created through people's experiences, in which the researcher and researched are mutually interactive and inseparable (Phillips, 1988). Sale, Lohfeld, and Brazil (2002) noted that the two different paradigms make the methods incommensurate. However, this does not mean that multiple methods cannot be combined in a single study if for complementary purposes. An awareness of such considerations was one reason underlying why the qualitative and quantitative results were analysed in parallel and not synthesised. The differing methods did not consistently provide corroborative evidence, but they did add depth and breadth to the study, highlighting some level of disagreement between the two approaches.

The design has a number of shortcomings. A cross sectional design was employed due to time and resource constraints but imposes limitations on inferring cause and effect relationships. Future research could be improved by utilising a longitudinal design to further elucidate the relationships between metacognitions, binge eating and obesity and allow rigorous testing of stability over time. Qualitative research can also be considered subjective, which prevents the generalisation to other populations.

4.3.2. Recruitment

Recruitment for the research was from two obesity clinics; one hospital and one community based service. While it is recognised that generalisability of findings from qualitative research is problematic, the use of varied sampling allows for the inclusion of a range of participants. However, only one participant was recruited from Cambridge Community Weight Management Service. Due to the opt in nature of the recruitment strategy it is not possible to calculate the response rate of this research, although it is estimated to be

poor as the sample size is small and recruitment from both clinics was substantially slower and lower than anticipated. This may be reflective of the recruitment process, the services involved, the population of study or a lack of interest in participating in this study.

It is important to consider how the motivation of those who chose to participate may introduce bias into the sample as systematic differences in the characteristics of respondents and non-respondents may detract from the validity of the conclusions. This is particularly important due to the shame and social stigma disclosed within the interviews. It is unknown whether respondents were those who felt emotionally strong enough to speak about their difficult experiences, or those who were hoping for support. Such experiences may have been a barrier to participation for others. Research has found that, compared to responders, non-responders tend to have higher levels of psychopathology (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; Kessler, Little, & Groves, 1995), different psychological characteristics (Dunne, Martin, & Bailey, 1997), less favourable relations with peers (Gerrits, van den Oord, & Voogt, 2001), and a lower socioeconomic status (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). However, research conducted within the field of eating disorders has reached discrepant conclusions. Mond, Rodgers, Hay, Owen, and Beumont (2004) suggested that there are no differences with respect to levels of eating disorder psychopathology, general physical and mental health, general psychological distress and socio-demographic characteristics between those who respond to eating disorder research and those who decline to participate. Dingemans, Bruna, and van Furthm (2002) on the other hand, found that those who decline to participate tend to have higher levels of eating psychopathology. It is also likely that staff at the weight loss clinics introduced bias through screening their patients and not discussing participation with those whom they considered to be most vulnerable, for risk of burdening them. This research tried to minimise such biases by adopting a wider recruitment strategy and approaching commercial weight loss

programmes and organisations, but unfortunately they declined to participate in this research (see Appendix A). It would be useful to explore the representativeness of participants in research to those in the general obese population.

4.3.3 Sample

This study had a relatively small sample size of ten participants. The findings and conclusions are limited by the small sample size, which unfortunately was restricted due to time and resource pressures. Despite this, it appeared that the binge eaters reached saturation as their results were consistent.

The sample included an obese comparison group recruited from the same weight-loss services. This helped ensure that any observed differences could be more easily linked to eating behaviour rather than co-morbid psychopathology, such as anxiety and depression (Heo, Pietrobelli, Fontaine, Sirey, & Faity, 2005). However, the conclusions are limited as the sample only included individuals who were in receipt of, or seeking medical weight loss intervention. Bias is therefore inherent in the research as the sample studied is not representative of the general population who have obesity or who have obesity and binge eat and so the applicability to them is unknown. The "help-seeking" nature of this sample suggests that they are likely to have experienced concerns related to their weight, shape, health and/or eating behaviour, and it has been well established that individuals seeking treatment for obesity report more psychopathology than obese individuals in the community (Kalarchian et al., 2007). Consequently the topics addressed during the interview were more likely to arouse emotions and therefore greater metacognitive activity than might be expected in the general population of those with obesity with and without binge eating. The current treatment status of participants was also not explored in detail; this may affect the results as treatment may have exposed participants to the identification and exploration of metacognitive constructs.

4.3.3.1 Gender.

All participants in the binge-eating group were female. The non-binge eating group consisted of one female and four males. The only female in the non-binge eating group (P9) reported markedly different metacognitions to the other non-binge eaters, with her results being similar to those in the binge-eating group. This makes it impossible to disentangle the effects of gender and eating behaviour on the metacognitions reported. It is therefore possible that the results could be explained entirely by gender differences; this is a significant limitation of the research project.

Unfortunately relatively little research exists on gender differences within the obese population, particularly with respect to binge eating (Mazzeo, Saunders, & Mitchell, 2006). Research exploring gender differences in males and females who binge eat indicates that there are no significant differences in BMI, frequency of binge eating, the associated features of eating disorders (measured by the Eating Disorder Examination Interview; Fairburn & Cooper, 1993; and the Three Factor Eating Questionnaire; Stunkard & Messick, 1985), self-esteem (measured by the Rosenburg Self-Esteem Scale; Rosenburg, 1979), or depression (measured by the Beck Depression Inventory; Beck & Steer, 1987). However, females do have significantly higher levels of eating, weight and shape concerns (Grilo & Masheb, 2001; 2004). Previous research also suggests that obese men who binge-eat are less disturbed about their weight than females (Mazzeo, Saunders, & Mitchell); it could be hypothesised that these lower levels of concern and disturbance in males may be associated with fewer metacognitions and metacognitive processes, although these studies do not address metacognitive differences. Future research needs to address the relationship between gender, eating behaviour and metacognitions for any links to be established.

It is also important to bear in mind that the gender imbalance within the groups is not wholly surprising since obese women are more likely to report binge eating and meet BED criteria than obese males (Marcus, 1995). Obese women also report higher levels of psychopathology than obese men (Carpenter, Hasin, Allison, & Faith, 2000; Onyike et al., 2003; Sullivan et al., 1993). It is also notable that the sample only consisted of white British participants; this is reflective of the general East Anglian population, the geographical region where participants were recruited. However, it does mean that inferences cannot be drawn about other ethnicities.

4.3.3.2 Group allocation.

The sample was divided into two groups for analysis with regard to binge eating status. In this research it was not possible to determine if participants met diagnostic criteria for BED as a diagnostic interview was not used. However two participants from the binge-eating group (P3 and P4) did report features that may be consistent with a DSM-IV diagnosis of BED, although this could not be confirmed.

The EDE-Q (Fairburn & Beglin, 1994) was utilised to assess for the presence of binge eating behaviours and to exclude people with other eating disorder psychopathology. The EDE-Q was considered appropriate as it displays good psychometric properties, has been used in comparable research and is time efficient. It was noted however that the participants' self-report estimates of binging using the EDE-Q did not always correspond with the verbal descriptions of their eating behaviour. This produced both an underestimation and an overestimation of behaviour at times. As all participants were followed up with an interview to clarify their eating behaviour this limitation of the EDE-Q was overcome in the current study.

It may have been beneficial to use the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993) instead of the EDE-Q. However research investigating the reliability of

these measures in binge eating populations has been inconsistent. Previous research reports elevated frequencies of binge-eating recorded by the EDE-Q in comparison to the EDE. Kalarchian, Wilson, Brolin, and Bradley (2000) studied 98 obese bariatric surgery candidates, finding that the EDE and EDE-Q frequencies of binge eating were significantly correlated (*r* = .60 to .77) and did not differ significantly, but the EDE-Q produced significantly higher scores. When studying participants with BED, Wilfley, Schwartz, Spurrell, and Fairburn (1997) reported that the EDE indicates significantly higher frequencies of binge eating than the EDE-Q. However, Grilo, Masheb, and Wilson (2001) found that the EDE and EDE-Q frequencies of binge eating episodes were significantly correlated and did not differ significantly. Due to these discrepancies it is difficult to determine which method generates the most valid estimates of BED features.

It may also have been useful to utilise BED diagnostic tools which are based upon the DSM-IV, such as the Structured Clinical Interview (SCID; First, Spitzer, Gibbon, & Williams, 2002) or the Questionnaire of Eating and Weight Patterns-Revised (QEWP-R; Spitzer et al., 1993). However, research has found inconsistent results when comparing these diagnostic tools and trying to determine the most accurate method of assessing BED. Dymek-Valentine, Rienecke-Hoste, and Alverdy (2004) examined their utility in a sample of obese adult patients being evaluated for gastric bypass surgery. They found that 27% of the sample received a diagnosis of BED using the QEWP-R, compared with 14% when using the SCID.

The decision was therefore taken to compare those who had no episodes of binge eating against those who possibly met full criteria for BED as well as sub-threshold BED. This decision was underlined by several considerations; a wider criterion increases the sample size of the binge-eating group; the validity of the diagnostic criteria for BED has been questioned (as discussed in section 1.3.3 of the introduction); and research has indicated that there are no significant differences between those who meet full BED diagnostic criteria and

those who binge eat but do not meet BED criteria (i.e. a "subthreshold" BED group), on a number of domains (Crow, Agras, Halmi, Mitchell, & Kraemer, 2002; Striegel-Moore et al. 2000). This suggests that the two populations (binge eating and BED) can be combined for research purposes. As binge eating and BED are often associated with obesity, all participants were obese making obesity, as defined by BMI, a commonality across both participant groups. This aimed to control the impact of metacognitive processes that may be associated with obesity and co-morbid psychopathology, rather than binge eating or BED.

4.3.4 Data collection and Measures

4.3.4.1 Metacognitive Profiling Interview.

The semi-structured metacognitive profiling interview (Wells, 2000) was used to obtain in-depth, qualitative data for conceptualising metacognitive processing in (binge) eating episodes. In line with the exploratory and qualitative nature of the study, the researchers demonstrated curiosity and flexibility to topics as they arose with further questioning being guided by participant's previous responses.

As described in the method section, the interview initially set the scene by asking participants to recall a time when they had eaten. The interviews conducted with the binge-eating group focused upon a binge-eating episode, whereas the interviews with the non-binge eating group focused upon a more general time when they had eaten. Consequently, the interviews were focused upon the recollection of different eating behaviour; behaviour which was likely to be associated with different emotions and cognitions and also therefore, different metacognitions. As a result, the participant groups may in fact have been answering different research questions. This is likely to have had a significant impact upon the results and it is possible that the differing interview topics could explain the group differences found here. This is also likely to have led to a lack of standardisation and consistency between the groups in the way the researchers worded the interview questions and used prompts. It is

possible that the interviewers may have unwittingly suggested themes to participants, guiding their responses and constraining the interview process. It is also noteworthy that not all participants conveyed the same amount of information, with the non-binge eaters (excluding P9) reporting significantly fewer metacognitions. Consequently the non-binge eater interviews may have also included more direct questioning.

Further inconsistencies may have been introduced as the current research analysed transcripts of interviews conducted by two different interviewers. Through the very nature of an interview, the researcher was continuously interacting with those being researched and thus influencing the research process. Variation in the researchers' interview practice is likely, particularly as the semi-structured interview schedule allowed the flexibility for salient aspects to be explored further and each interviewer had a vested interest in different aspects of the schedule. It is also likely that the researchers would be more familiar with the transcripts of the interviews that they individually conducted; this may have resulted in bias towards these interviews during analysis. To minimise biasing effects and enhance credibility and trustworthiness, triangulation was used. The data and analysis were discussed with the collaborative researcher, within qualitative research supervision and the qualitative research forum provided by the University of East Anglia. Different data sources (questionnaires, interview and observation data) were also triangulated. Additionally, two transcripts were coded by both investigators to enhance trustworthiness of the coding. Respondent validation was sought but all participants declined.

In line with the critical realist stance, it was acknowledged that the researcher cannot free herself of her theoretical and epistemological commitments. The researchers' role as a Trainee Clinical Psychologist and her personal and professional characteristics will have inevitably influenced and structured the research processes, the perception of the findings and thus the outcomes produced and the objectivity of the results being generated (Levitt, Butler,

& Hill, 2006, Morrow, 2005). Objectivity was however, enhanced by allowing the reader insight into the researcher's position (see Section 2.4) and through transparency in reporting the results. Such considerations were also recorded in reflexive memos to enhance awareness and enable researchers to reflect how their own understanding of the data may affect their interpretations.

4.3.4.2 Quantitative measures.

All quantitative measures were standardised, with good reliability and validity as detailed in the method section, they had also been used in studies investigating similar areas (e.g. Konstantellou & Reynolds, 2010 and Woolrich & Cooper, 2008). Self-report measures enables large amounts of data to be collected quickly and economically, however ample evidence suggests potential flaws due to framing (Schwarz, 1999), order (Schwarz, Strack, & Mai, 1991) or congruency effects (Strack, Schwarz, & Gschneidinger, 1985). The reliance on self-report data for weight and height assessment may be a further weakness as research suggests that obese individuals tend to under-report their weight (Rossouw, Senekal, & Stander, 2001) and overestimate height thereby underestimating obesity (Hill & Roberts, 1998; Nieto-García, Bush, & Keyl, 1990).

Participants completed eight self-report questionnaires enabling a comprehensive profile for each individual. The number of questionnaire items is high due to the pooling of the questionnaires analysed for the current study, and those analysed by the collaborating researcher. The questionnaires were pooled and data were collected collaboratively because four of the questionnaires were analysed for both research studies and they required participants meeting the same inclusion and exclusion criteria. Therefore recruitment of the same individuals helped to reduce participant burden. However, the number of items may have dissuaded some potential participants from taking part, and the completion of the questionnaires may have been time consuming, possibly causing respondent burden and

fatigue. It is notable that the HADS (Zigmond & Snaith, 1983) was the final measure in the questionnaire booklet, and that this was the only measure to have not had any items completed by one participant (P10). It may have been useful to include validity items to address potential random endorsement and/or counterbalance the order of the questionnaires to compensate for potential order effects. However, it would have been very difficult to verify or measure this effect, or ensure the questionnaires were completed in this order. Where possible, respondent burden was minimised by selecting the shortest versions of the measures (e.g. the MCQ-30).

4.3.4.3.1 Effect of mood.

The current study found that participants in the binge-eating group obtained higher ratings for anxiety and depression than participants who do not binge eat. It is possible that the increase in metacognitions and metacognitive processes reported by the binge-eating group may be confounded by, or reflective of low mood and anxiety. The link between metacognitions, CAS, anxiety disorders (Wells, 1995) and depression (Papageorgiou & Wells, 2003) has been well established.

4.3.5 Procedure

As noted in Appendix A there were a number of initial difficulties with recruitment for the current research project. Consequently the research methodology was revised several times and the focus changed to a qualitative investigation. Given the limited theoretical understanding of metacognitions in binge eating and obesity the current methodology was appropriate. All steps to ensure methodological and reflexive rigour (detailed in Section 2.11) were employed throughout the research process. Attempts were made to make participants feel at ease, these were considered successful as participants were open and honest regarding

topics that they considered shameful and embarrassing. Many participants reported that the interviews were interesting and helpful.

4.3.6 Analysis

Template analysis was appropriate as it enabled themes which were well identified in the literature to be made part of the analysis procedure in a transparent process. The use of two hierarchical template sequences allowed the two participant groups to be compared and contrasted, and the development of knowledge to be documented as the themes and sub-themes were modified.

The development of a priori templates before the interviews were conducted could be viewed as having constrained the interview process. It is possible that the researchers may have focused on themes within the template and unduly directed the questioning in a manner which may have influenced participant's responses. This could have resulted in a degree of social desirability bias.

It was not possible to completely remove the potential for the findings to be influenced by prior expectations, personal positions and the literature reviewed. However, measures were taken to reduce this bias and the impact upon the research is likely to have been minimal. The a priori themes, researcher expectations and epistemological and ontological perspectives were made available to the reader as their potential impact upon the findings was acknowledged. By reflecting on and being explicit about these, the researcher was able to consider the similarities and differences between expectations and results; some expectations were confirmed and others were challenged, when challenged the templates were modified accordingly. The researchers were also interested in data that did not fit the templates through the process of negative case analysis. By making expectations and the

process of analysis explicit, the reader is able to assess the researchers' findings in the light of the assumptions which have inevitably shaped them.

Unfortunately due to the small sample size the quantitative measures could not be statistically analysed and so conclusions drawn are limited. However they do contextualise the sample providing valuable information and initial impressions of the self-report findings.

4.4 Implications of the Study and Future Directions for Research

This section provides a more detailed appraisal of the present study in terms of theoretical and clinical implications, and ideas for further research.

4.4.1 Theoretical Implications

This study aimed to explore the metacognitive knowledge, processes and control strategies experienced by participants with obesity, with and without binge eating or BED. Of particular interest were the similarities and differences between the two groups and the extent to which the Self-Regulatory Executive Function (S-REF) model (Wells & Matthew, 1994; 1996), an integrative information-processing model of emotional disorder, could be applied.

The results suggest that metacognitions and metacognitive processes are implicated in binge eating in obesity. They provide some evidence that the S-REF model might apply to individuals with obesity and binge eating or BED. When considered as a whole, the results indicate that participants with obesity and binge eating experience many symptoms of cognitive attentional syndrome (CAS; Wells, 2000). They experience greater positive and negative metacognitive beliefs, low cognitive confidence and heightened cognitive self-consciousness, accompanied by poorly defined processing goals. Other symptoms include heightened self-focused attention and negatively biased attention style. The binge eaters were also found to engage in the maladaptive thought control strategies; rumination, self-punishment and thought suppression. According to the S-REF model, these types of

processing are problematic for several reasons. They increase the accessibility of negative information, thoughts and emotions, deplete the attentional resources available for processing information that is incompatible with dysfunctional beliefs, lead to performance deficits and reduce the flexibility and efficiency of the cognitive system to develop more adaptive knowledge, therefore negative thoughts and emotions persist (Wells, 2000). The binge eaters appeared to use bingeing as one form of emotional regulation; bingeing however contributes to dysregulation and the maintenance of negative beliefs and emotional distress, and therefore emotional disorder and relapse. It is, however important to note that the binge eaters also displayed distraction. Distraction is hypothesised to be an adaptive strategy and was a commonality between the binge-eating group and the non binge-eating group.

Overall, it seemed that the non-binge eaters may be in metacognitive mode, whereby their attentional resources are invested in appraising and modifying cognition. Contrastingly, the binge eaters may have been in object mode, a processing mode in which attentional resources and coping efforts are directed towards monitoring, evaluating and preventing threats to the self. Object mode is hypothesised as counterproductive for cognitive-emotional change (unless the danger and threat to self are real), and therefore relates to CAS and emotional disorder (Wells, 2000).

4.4.2 Clinical Implications

This study revealed higher levels of metacognitions and maladaptive metacognitive processes in participants with obesity and binge eating or BED than without binge eating. The clinical implications of these findings will now be considered.

This research indicates that the metacognitions and metacognitive processes involved in the development and maintenance of binge eating and BED in obesity are often very different from those involved in obesity without binge eating or BED. The participants who reported binge eating also reported large amounts of distress; distress was a consequence of

both cognitive processes and binge eating behaviour. If patients do meet criteria for binge eating or BED it may be helpful for them to be referred for psychological treatment where the role of metacognitions could be considered.

The results of this study support the idea that individuals with binge eating or BED should be offered specialised treatment that is tailored to their presentation. The recall of negative memories was a salient feature of all interviews in the binge-eating group and was often considered to be the trigger for binge eating episodes. This was the most striking difference between the binge eaters and the non binge eaters. According to the S-REF model, the high arousal experienced by participants in the binge-eating group may prevent the emotional processing of these memories and so they continue to reduce their ability to appraise and cope with threat.

This study also supports the idea that individuals with binge eating or BED should be offered treatment that is distinct from the treatment for obese non-binge eaters. Treatment may benefit from addressing the metacognitions and metacognitive processes that may be involved in the development and maintenance of binge eating and BED in obesity. The use of metacognitive therapy (MCT; Wells, 2000) which is based on the S-REF model (Wells & Matthews, 1994) may therefore be appropriate. MCT consists of formulating the CAS and the associated metacognitions in psychological disorders. When treating binge eating and BED, it may be helpful for MCT to focus upon modifying higher order metacognitive processes, such as positive and negative metacognitive beliefs. Once formulated, treatment may focus on reducing the thought control strategies rumination, punishment and thought suppression. These findings suggest that binge eating is a coping behaviour which interferes with self-regulatory processes and the correction of maladaptive knowledge. Therefore, as suggested by Nordahl (2009) a treatment goal should be to eliminate binge eating.

Overall, this research suggests that metacognitions and metacognitive processes underlie and distinguish those with obesity and binge eating or BED from those with obesity without binge eating or BED. Individuals with obesity and binge eating or BED are likely to require psychological intervention, and may fail to benefit from treatments that target obesity as a purely physical disorder. Therefore focus upon metacognitive constructs is highly important in the treatment and clinical management of binge eating and BED.

4.4.3 Future Directions for Research

The current research indicates that the investigation of metacognitions and metacognitive constructs in obesity and binge eating or BED is an area worthy of further research. Further research is needed to develop an empirically tested disorder-specific model of binge eating or BED. This would facilitate the understanding of the metacognitive processes and structures so that individual treatment can be formulated. This is important as the binge eaters' presentation was not wholly consistent with the a priori themes. Such discrepancies suggest that binge eaters may have a unique presentation, and so other metacognitive models of emotional disorders would need adapting specifically.

Further research is needed with a much larger sample size to clarify the role of metacognitions and statistically compare the two groups, particularly those who meet sub-threshold and full BED criteria as the differing severities of binge eating in this research may have distorted the results. It may also be beneficial for them to be studied in relation to a non-obese comparison group and in a community sample, where the range of obesity may be more varied to represent the lower as well as higher spectrum of obesity as measured by BMI. Future research could be improved by using a longitudinal design to elucidate the relationships between metacognitions, binge eating and obesity and allow testing of stability over time. Additional factors, particularly gender, ethnicity, BMI, and co-morbid general

psychopathology should also be considered in further investigations of metacognitions in people with obesity and binge eating.

This research found that negative memories were predominant within the binge-eating group; it would be interesting for research to investigate the link between negative life events and the development of binge eating and BED in obese populations.

4.5 Overall Conclusions

In the present study, participants with obesity and binge eating or BED were found to experience greater and more problematic metacognitions and metacognitive processes than the participants with obesity without binge eating. The qualitative findings from the Metacognitive Profiling Interview (Wells, 2000) suggested that participants in the binge-eating group experience greater positive and negative metacognitive beliefs, low cognitive confidence and heightened cognitive self-consciousness, as well as poorly defined processing goals. With regards to metacognitive processes, the binge eaters reported heightened self-focused attention and a negatively biased attention style compared to the non-binge eaters. The binge eaters also engaged in more maladaptive thought control strategies, specifically rumination, self-punishment and thought suppression. Both participant groups reported engaging in distraction. Although the quantitative results from the self-report measures were not statistically analysed, they do support and contextualise the qualitative results.

This study has a number of strengths, including its use of an in-depth qualitative interview, as well as reliable and valid self-report measures, and the use of a clinical sample. This study adds to and builds upon existing research, but its exploration of metacognitions specifically in binge eating and obesity is novel. Although there are a number of limitations to this research it makes a valid contribution to the literature, suggesting that the S-REF model may have relevance for binge eating in obesity. Further research may allow the development of a disorder-specific theoretical framework based on the concept of

metacognitions. A theory-driven framework may be applied to inform and advance treatment, maximising the effectiveness of psychological intervention in obese individuals with BED or binge eating.

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Appendices List

Appendix A

Research Changes

As noted throughout this thesis, there were a number of changes made to the methodology of this research study. Initially it was intended that this research project would be mainly quantitative data collection with a small qualitative component. It was hoped that 128 participants would be recruited to complete the self-report questionnaire measures, and a much smaller sample (N=10) of participants with binge eating would be interviewed. The researchers and supervisors met with the participating services in August 2011. It was agreed that this project would be feasible within the time frame, and all services and staff were very supportive of the idea and keen to be involved. A timetable for participant recruitment was drawn up and mutually agreed between the researchers, the study supervisors at UEA and the clinicians and staff in participating services. Following these meetings, the researchers gained NHS ethical approval (November 2011), and research and development approval for Cambridgeshire Community Services NHS Trust (December, 2011) and Addenbrookes Hospital, Cambridge University Hospitals NHS Foundation Trust (January 2012). The researchers also gained letters of access to the services and completed all relevant training.

Unfortunately, during the recruitment phase this research encountered a number of severe difficulties. These difficulties were not anticipated, did not appear to be avoidable and ultimately were insurmountable. Addenbrooke's Obesity Clinic became short staffed and was seeking to recruit additional staff, specifically aiming to get a Clinical Psychologist in post. Consequently, despite initially agreeing to approach current patients and ethical approval having been gained to carry out the study as initially discussed with the clinics, the staff maintained that they no longer wanted existing patients to be approached about the study. At the same time due to staff shortages, very few new patients were being assessed for the clinic. The researchers also encountered numerous difficulties in forging a link with and contacting

Cambridge Community Obesity/Weight Loss Service, despite modifying the recruitment strategy on request to reduce potential burden on staff, and an amendment being approved by the ethics committee to achieve this procedural change. Several meetings (N= 6) were held with the services and there was much correspondence between the researchers, their supervisors and the services, however although agreements were reached about implementing procedures for recruitment it seemed very difficult for actions and plans to be enforced in practice. Consequently, between December 2011 and March 2012 only three participants had been recruited and the research project was severely delayed, despite intense efforts by the researchers and the research supervisors.

Following these difficulties a different direction for the research was considered which involved data collection in a non clinical population. Consequently ethical approval was sought and gained from the Faculty of Medicine and Health Sciences Research Ethics Committee in March 2012. This enabled the research to continue in a non-clinical population. The commercial weight loss programmes Slimming World, Weight Watchers and Lighterlife were all contacted, and although initially interested in the research these services subsequently declined to participate. They suggested that obesity was a very sensitive topic area and discussion of it may be detrimental to their member's mental wellbeing and could jeopardise their weight loss. Commercial services also said that they did not want to risk potential negative publicity if people misinterpreted why their members were involved in a binge eating study.

Consequently, after lengthy discussion and with the support of Sian Coker, Gillian Todd and Malcolm Adams the research project changed focus, with the qualitative component being dominant, as reported in this research study. This was deemed appropriate as all participants that had given their consent had also expressed an interest in completing the interviews, and additionally therefore the questionnaire data already collected on this

small sample could be included. The change involved emphasising to staff and participants that the interview was the focus of the research. There was a potential risk that participants would complete the questionnaires but not wish to be involved in the interview, but fortunately this did not happen. This design also had many benefits; it required fewer participants and enabled a rich insight into a novel area. However, it also meant that the quantitative data could not be statistically analysed as the sample size was too small, and the research packs may have seemed more convoluted than strictly necessary, particularly the addition of the interview reply slip. Fortunately, the researchers were able to clarify any questions, and all participants that completed the questionnaires gave their consent for the interviews as well.

Appendix B

Metacognitive Profiling Interview Schedule

Wells & Matthews, (1994)

Meta-beliefs/appraisals

Question: When you felt anxious / depressed/ were binge eating...did you have any thoughts about your mental state? What were these thoughts?

Probes: Did you have any negative thoughts about your own thinking? What thoughts did you have?

Did you notice that you were worried or ruminating about something? What was your rumination like?

Question: Do you think there are advantages to worrying/negative thinking?

Probe: What are the advantages?

Question: Do you think there are disadvantages to worrying/negative thinking?

Probe: What are the disadvantages?

Question: Can worrying/ruminating/thinking in certain ways be harmful or dangerous?

Probe: In what ways could it be harmful or dangerous?

Coping strategies

Question: When you felt anxious / depressed / were binge eating what did you do to cope with the situation?

Probes: Did you do anything to deal with the threat or danger?

What did you do?

Did you do anything to control your thoughts?

What did you do?

Did you do anything to deal with your feelings?

What did you do?

Question: What was your goal in using you coping strategies? What did you hope to achieve?

Probes: How did up know that you had accomplished your goals?

How would you know when coping is effective?

What was the effect of your coping strategies on your feelings and thoughts?

Cognitive processes, attention

Question: What were you paying most attention to in the situation?

Probes: What was most salient?

Were you focusing on your thoughts, on your feelings, or the situation?

Were you self-conscious? What were you most conscious of?

Are there any advantages to focusing your attention in that way? What are they?

Are there any disadvantages to focusing your attention in that way? What are they?

Cognitive processes, **memory**

Question: Were any memories activated? What were they?

Probes: Did you use your memory to try and work out what was happening, and/or How to deal with the situation?

How did you use your memory?

Cognitive processes, **judgements**

Question: How did you form your judgements in the situation?

Probes: What sort of evidence did you look for?

Where was your evidence coming form to support your thoughts?

Were your judgements influenced by your physical feelings?

Which feelings?

Were you influenced by mental feelings?

Were you influenced by your emotional feelings?

Question: If your feelings had been different, would you have judged the situation differently?

Question: How confident were you in your won mental abilities?

Mode

Question: Did you accept your thoughts and judgements as facts, based on reality?

Question: Could you see your thoughts as distortions of what was really happening in the situation?

Question: Can you keep your distance from these negative thoughts and feelings when they occur?

Appendix C

DEMOGRAPHIC INFORMATION FORM

In order for us to understand a bit more about the people taking part in our research we would like to collect some general information about you. If you have any concerns about sharing these details please discuss this with the researchers.

Please complete the following details:

Date _ _/_ _ /_ _ _ _

Gender (please circle) Male Female

Date of birth _ _/_ _ /_ _ _ _

Ethnicity (please circle)

White

Mixed Ethnic Group

Black

Black British

Asian

Asian British

Any Other Group

Marital status (please circle)

Single

Married

Civil partnered

Cohabiting

Divorced

Separated

Widowed

Are you currently working? (please circle)

Yes – full time

Yes – part time

No

If yes, what is your occupation? _____

Please complete your:

Most recent weight when measured at the clinic _____ kg or _____ stones/lbs

Date when most recently weighed at the clinic _ _/_ _ /_ _ _ _

Current height ft/inches _____ m or _____

Highest adult weight stones/lbs (since 18 years of age) _____ kg or _____

Lowest adult weight stones/lbs (since 18 years of age) _____ kg or _____

Please describe brief details of your current treatment for obesity:_____

_____

_____

Please describe brief details of any past treatment you received for obesity:____

_____

_____

Thank you for your help.

Appendix D

EATING QUESTIONNAIRE

Instructions: The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

	On how many of the past 28 days	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1	Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3	Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4	Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5	Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6	Have you had a definite desire to have a totally flat stomach?	0	1	2	3	4	5	6
7	Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8	Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11	Have you felt fat?	0	1	2	3	4	5	6
12	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days) .....

13 Over the past 28 days, how many <u>times</u> have you eaten what other people would regard as an <u>unusually large amount of food</u> (given the circumstances)?	.....
14 ..... On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?	.....
15 Over the past 28 days, on how many **<u>DAYS</u>** have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food <u>and</u> have had a sense of loss of control at the time)?	.....
16 Over the past 28 days, how many <u>times</u> have you made yourself sick (vomit) as a means of controlling your shape or weight?	.....
17 Over the past 28 days, how many <u>times</u> have you taken laxatives as a means of controlling your shape or weight?	.....
18 Over the past 28 days, how many <u>times</u> have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	.....

Questions 19 to 21: Please circle the appropriate number. <u>Please note that for these questions the term "binge eating" means</u> eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19 Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? ..... Do not count episodes of binge eating	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
	0	1	2	3	4	5	6
20 On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? ..... Do not count episodes of binge eating	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time
	0	1	2	3	4	5	6
21 Over the past 28 days, how concerned have you been about other people seeing you eat? ..... Do not count episodes of binge eating	Not at all		Slightly		Moderately		Markedly
	0	1	2	3	4	5	6

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past 28 days	**Not at all**		**Slightly**		**Moderate -ly**		**Markedly**
22 Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23 Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24 How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25 How dissatisfied have you been with your weight?	0	1	2	3	4	5	6
26 How dissatisfied have you been with your shape?	0	1	2	3	4	5	6
27 How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28 How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate.) .....

What is your height? (Please give your best estimate.) .....

If female: Over the past three-to-four months have you missed any menstrual periods? .....

If so, how many? .....

Have you been taking the "pill"? .....

THANK YOU

Appendix E

META-COGNITIONS QUESTIONNAIRE 30

Adrian Wells & Samantha Cartwright-Hatton (1999)

This questionnaire is concerned with beliefs people have about their thinking.

Listed below are a number of beliefs that people have expressed. Please read each item and say how much you **generally** agree with it by **circling** the appropriate number. Please respond to all the items, there are no right or wrong answers.

		Do not agree	Agree slightly	Agree moderately	Agree very much
1.	Worrying helps me to avoid problems in the future	1	2	3	4
2.	My worrying is dangerous for me	1	2	3	4
3.	I think a lot about my thoughts	1	2	3	4
4.	I could make myself sick with worrying	1	2	3	4
5.	I am aware of the way my mind works when I am thinking through a problem	1	2	3	4
6.	If I did not control a worrying thought, and then it happened, it would be my fault	1	2	3	4
7.	I need to worry in order to remain organised	1	2	3	4
8.	I have little confidence in my memory for words and names	1	2	3	4
9.	My worrying thoughts persist, no matter how I try to stop them	1	2	3	4
10	Worrying helps me to get things sorted out in my mind	1	2	3	4
11.	I cannot ignore my worrying thoughts	1	2	3	4
12.	I monitor my thoughts	1	2	3	4
13.	I should be in control of my thoughts all of the time	1	2	3	4
14.	My memory can mislead me at times	1	2	3	4

		Do not agree	Agree slightly	Agree moderately	Agree very much
15.	My worrying could make me go mad	1	2	3	4
16.	I am constantly aware of my thinking	1	2	3	4
17.	I have a poor memory	1	2	3	4
18.	I pay close attention to the way my mind works	1	2	3	4
19.	Worrying helps me cope	1	2	3	4
20.	Not being able to control my thoughts is a sign of weakness	1	2	3	4
21.	When I start worrying, I cannot stop	1	2	3	4
22.	I will be punished for not controlling certain thoughts	1	2	3	4
23.	Worrying help me to solve problems	1	2	3	4
24.	I have little confidence in my memory for places	1	2	3	4
25.	It is bad to think certain thoughts	1	2	3	4
26.	I do not trust my memory	1	2	3	4
27.	If I could not control my thoughts, I would not be able to function	1	2	3	4
28.	I need to worry, in order to work well	1	2	3	4
29.	I have little confidence in my memory for actions	1	2	3	4
30.	I constantly examine my thoughts	1	2	3	4

Appendix F

THOUGHT CONTROL QUESTIONNAIRE

Adrian Wells & Mark Davies

Most people experience unpleasant, and / or unwanted thoughts, (in verbal and / or picture form), which can be difficult to control. We are interested in the techniques that you **generally** use to control such thoughts.

Below are a number of things that people do to control these thoughts. Please read each statement carefully, and indicate how often you use each technique by **circling** the appropriate number.

When I experience an unpleasant / unwanted thought:

		NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
1.	I call to mind positive images instead.	1	2	3	4
2.	I tell myself not to be so stupid.	1	2	3	4
3.	I focus on the thought.	1	2	3	4
4.	I replace the thought with a more trivial bad thought.	1	2	3	4
5.	I don't talk about the thought to anyone.	1	2	3	4
6.	I punish myself for thinking the thought.	1	2	3	4
7.	I dwell on other worries.	1	2	3	4
8.	I keep the thought to myself.	1	2	3	4
9.	I occupy myself with work instead.	1	2	3	4
10	I challenge the thoughts validity.	1	2	3	4
11.	I get angry at myself for having the thought.	1	2	3	4
12.	I avoid discussing the thought.	1	2	3	4
13.	I shout at myself for having the thought.	1	2	3	3
14.	I analyse the thought rationally.	1	2	3	4

		NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
15.	I slap or pinch myself to stop the thought.	1	2	3	4
16.	I think pleasant thoughts instead.	1	2	3	4
17.	I find out how my friends deal with these thoughts.	1	2	3	4
18.	I worry about more minor things instead.	1	2	3	4
19.	I do something that I enjoy.	1	2	3	4
20.	I try to reinterpret the thought.	1	2	3	4
21.	I think about something else.	1	2	3	4
22.	I think more about the more minor problems I have.	1	2	3	4
23.	I try a different way of thinking about it.	1	2	3	4
24.	I think about past worries instead.	1	2	3	4
25.	I ask my friends if they have similar thoughts.	1	2	3	4
26.	I focus on different negative thoughts.	1	2	3	4
27.	I question the reasons for having the thought.	1	2	3	4
28.	I tell myself that something bad will happen if I think the thought.	1	2	3	4
29.	I talk to a friend about the thought.	1	2	3	4
30.	I keep myself busy.	1	2	3	4

Cambridge University Hospitals NHS
NHS Foundation Trust

Version 4 27/10/11

University of East Anglia

PARTICIPANT INFORMATION SHEET

ADDENBROOKES' OBESITY CLINIC

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton (Trainee Clinical Psychologists)

Invitation paragraph

You are being invited to take part in two research studies. The first study involves asking a large number of people to complete some questionnaires and the second smaller study involves interviewing a small number of people. Before you decide whether to participate in these studies it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please contact us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

This information sheet refers to both the research studies. The studies are being conducted by the same group of researchers who are investigating similar areas. This information sheet provides you with information which relates to both studies, as well as a more in-depth description of what each study involves.

Thank you for reading this.

What is the purpose of these studies?

The purpose of these studies is to investigate and try to understand the thinking styles and beliefs of people who are classified as medically obese and report binge eating compared to people who are obese who do not report binge eating. This is to help describe and increase the understanding of such thinking styles.

Why have I been invited to take part?

You have been invited because you have been referred to an obesity clinic. We are interested in recruiting people who report binge eating and people who do not report this behaviour. We are hoping to recruit 128 people in total for Study 1 (the questionnaire study), and 10 people for Study 2 (the interview study).We would like people who take part in the interview study to have also completed the questionnaires.

Do I have to take part?

No, participation in this research is completely voluntary. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part will not affect the treatment you receive in the clinic at present, or in the future.

Study 1 Questionnaire Study

What will happen to me if I take part in study 1?

Study 1 involves completing eight questionnaires. The questionnaires should take between 30-45 minutes to complete in total.

The questionnaires will be given to you in a questionnaire pack. The pack will contain all questionnaires, instructions for completion, a consent form and a stamp addressed envelope for you to return the completed questionnaires to us.

How do I take part in the questionnaire study?

If you are interested in taking part in this study, please ask staff at the clinic to provide you with an information and questionnaire pack. Completed questionnaires and consent forms can be returned in the stamped addressed envelope provided. If you would prefer, you can also post them in a special study post box located at the obesity clinic. If you do decide to take part, we would ask you to return the completed questionnaires within 4 weeks of receiving them.

We would like your permission for us to access a small section of your medical records so that we can obtain measures of your most recent weight and height. If your give your permission for us to do this , please indicate this on the consent form by initialling the appropriate box. All weights and heights recorded will remain confidential.

Study 2 The Interview Study

What will happen to me if I take part in this study?

Study 2 involves completing an interview about your thoughts about eating. We are hoping to conduct interviews with 10 people who have also completed the questionnaires. This interview would be conducted individually, at a convenient time, date and location for you, usually at the clinic. Any travel expenses incurred to you will be reimbursed. The interviews typically vary in length from approximately 45 minutes to one hour and 45 minutes.

With your consent, the interviews will be audio recorded, this is to enable the researchers to transcribe and analyse the interviews. Once the interviews have been transcribed we will give you the option to read through your transcript to ensure that you feel it accurately reflects what you said. The final report will contain some direct quotes from the interviews, but all quotes will be anonymised, and so it will not be possible to personally identify you.

How do I take part in the Interview study?

If you would be interested in taking part in the interview study please complete the separate interview reply slip and record your name, address and contact phone number. We will contact you between January and March 2012 to let you know whether we would like you to take part in the interview, and if so arrange a convenient time, date and location for the interview to be conducted. If lots of people offer to be interviewed we may not be able to interview everybody due to time constraints. We would like everybody that takes part in the interview to have also completed the questionnaires.

Further Information Relating To Both Studies

What are the possible disadvantages and risks of taking part in either study?

Answering the questions will take up some of your time but we do not anticipate that the questionnaires or the interview will cause any distress. However, if you do become distressed you can take a break or withdraw from the study at any time if you want to. If you become distressed during the interview, the researcher will stop the interview if necessary and will provide support. The researchers have clinical skills and experience of dealing with distress and will be able to use these skills if necessary. If you find any of the questions upsetting, have any concerns, or if you would like any further information, you can contact either of the researchers, Georgina Hartley or Stephanie Ashton, on the email addresses at the bottom of this information sheet. We will if necessary suggest who might be the best person to deal with your concerns, for example, your GP or a member of staff at the obesity clinic.

What are the possible benefits of taking part?

There are no individual benefits in taking part. However, we hope that the information we gain from this research will help us to learn more about the thinking styles and beliefs of people that are obese and those that binge eat. We hope that furthering our understanding of these areas may have helpful implications for future treatment programmes.

What happens when the research study stops?

The results will be written up by members of the research team. It will not be possible to identify you individually in this report. The report will be shared with people who work at

the obesity/weight loss clinic. Another copy of the report will be submitted to the University of East Anglia as part of the coursework of the members of the research team. The results may also be published in academic journals. You will not be identified in any of these reports. If you would like to receive a summary of the results please indicate this on the consent form and you will need to provide your name and contact details.

What if something goes wrong?

If you are harmed by taking part in this research project there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. The University of East Anglia has arranged insurance cover for this research. If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, you can do this through the National Health Service complaints procedure. Details of which can be obtained from the NHS website www.nhs.uk. You can also contact the Patient Advice and Liaison Service (PALS) at Addenbrooke's if you wish to report any concerns (email: pals@addenbrookes.nhs.uk / telephone number: 01223 216 756).

Will my taking part in this study be kept confidential?

Yes, all information which is collected about you during the course of the research will be kept strictly confidential. Any information about you will have your name and address removed so you cannot be identified from it.

However, there are some exceptions where we would need to break confidentiality. If you disclose something which suggests that you or others could be at risk of harm, or if there is

any suggestion of criminal activity or malpractice then the relevant persons or authorities will be informed.

Who is organising and funding the research?

The research is part of the researcher's course, the doctorate in clinical psychology at the University of East Anglia. As a Trainee Clinical Psychologist, the researcher is employed by Cambridge and Peterborough NHS Foundation Trust.

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people called a Research Ethics Committee to protect your safety, rights, wellbeing and dignity. This study has been reviewed and approved by NHS Research Ethics Committee.

Contact for further information

If you wish to speak to us about the study for any reason, please do not hesitate to approach us when we next visit the obesity/weight loss clinic or contact us via the email addresses below.

Georgina Hartley (researcher and Trainee Clinical Psychologist); G.Hartley@uea.ac.uk

Stephanie Ashton (researcher and Trainee Clinical Psychologist); S.Ashton@uea.ac.uk

Dr Sian Coker (researcher's primary supervisor and clinical lecturer): S.Coker@uea.ac.uk

Dr Gillian Todd (researcher's second supervisor and clinical lecturer): G.Todd@uea.ac.uk

Appendix H

PARTICIPANT INFORMATION SHEET

COMMUNITY WEIGHT LOSS SERVICE

University of East Anglia

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton (Trainee Clinical Psychologists)

Invitation paragraph

You are being invited to take part in two research studies. The first study involves asking a large number of people to complete some questionnaires and the second smaller study involves interviewing a small number of people. Before you decide whether to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please contact us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

This information sheet refers to both the research studies. The studies are being conducted by the same group of researchers who are investigating similar areas. This information sheet provides you with information which relates to both studies, as well as a more in-depth description of what each study involves.

Thank you for reading this.

What is the purpose of these studies?

The purpose of both of these studies is to investigate and try to understand the thinking styles and beliefs of people who are medically classified as obese and report binge eating compared to people who are medically classified as obese who do not report binge eating. This is to help describe and increase the understanding of such thinking styles.

Why have I been invited to take part?

You have been invited because you have been referred to a weight loss programme. We are interested in recruiting people who report binge eating and people who do not report this behaviour. We are hoping to recruit 128 people in total for Study 1 (the questionnaire study) , and 10 people for Study 2 (the interview study).We would like people who take part in the interview study to have also completed the questionnaires.

Do I have to take part?

No, participation in this research is completely voluntary. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time or a decision not to take part will not affect the treatment you receive, now or in the future.

Study 1 Questionnaire Study

What will happen to me if I take part in study 1?

Study 1 involves completing eight questionnaires. The questionnaires will take between 30-45 minutes to complete in total.

The questionnaires will be given to you in a questionnaire pack. The pack will contain all questionnaires, instructions for completion, a consent form and a stamp addressed envelope for you to return the completed questionnaires to us.

How do I take part in the questionnaire study?

If you are interested in taking part in this study please provide your contact details at the end of this sheet and return this form at your first appointment at the weight loss clinic. Staff at the clinic will then pass your contact details to us. Researchers will then telephone you to ask whether you are still interested in participating in this research. If you do decide to take part, we will send you the questionnaire pack to complete Completed questionnaires and consent forms can be returned in the stamped addressed envelope provided. We would ask you to return the completed questionnaires within 4 weeks of receiving them.

We would like your permission for us to access a small section of your medical records so that we can obtain measures of your most recent weight and height. If your give your permission for us to do this, please indicate this on the consent form by initialling the appropriate box. All weights and heights recorded will remain confidential.

Study 2 The Interview Study

What will happen to me if I take part in this study?

Study 2 involves completing an interview about your thoughts about eating. We are hoping to conduct interviews with 10 people who have also completed the questionnaires. This interview would be conducted individually, at a convenient time, date and location for you, usually at the clinic. Any travel expenses incurred to you will be reimbursed. The interviews typically vary in length from approximately 45 minutes to one hour and 45 minutes.

With your consent, the interviews will be audio recorded, this is to enable the researchers to transcribe and analyse the interviews. Once the interviews have been transcribed we will give you the option to read through your transcript to ensure that you feel it accurately reflects what you said. The final report will contain some direct quotes from the interviews, but all quotes will be anonymised, and so it will not be possible to personally identify you.

How do I take part in the Interview study?

If you would be interested in taking part in the interview study please complete the separate interview reply slip and record your name, address and contact phone number. We will contact you between January and March 2012 to let you know whether we would like you to take part in the interview, and if so arrange a convenient time, date and location for the interview to be conducted. If lots of people offer to be interviewed we may not be able to interview everybody due to time constraints. We would like everybody that takes part in the interview to have also completed the questionnaires

Further Information Relating To Both Studies

What are the possible disadvantages and risks of taking part in either study?

Answering the questions will take up some of your time but we do not anticipate that the questionnaires or the interview will cause any distress.

However, if you do become distressed at any point you can take a break or withdraw from the study at any time if you want to. If you become distressed during the interview, the researcher will stop the interview if necessary and will provide support. The researchers have clinical skills and experience of dealing with distress and will be able to use these skills if necessary.

If you find any of the questions upsetting, have any concerns, or if you would like any further information, you can contact either of the researchers, Georgina Hartley or Stephanie Ashton, on the email addresses at the bottom of this information sheet. We will if necessary suggest who might be the best person to deal with your concerns, for example your GP or a member of staff at the weight loss clinic.

What are the possible benefits of taking part in either study?

There are no individual benefits in taking part. However, we hope that the information we gain from this research will help us to learn more about the thinking styles and beliefs of people that are obese and those that binge eat. We hope that furthering our understanding of these areas may have helpful implications for future treatment programmes.

What happens when the research studies stop?

The results will be written up by members of the research team. It will not be possible to identify you individually in this report. The report will be shared with people who work at the obesity/weight loss clinic. Another copy of the report will be submitted to the University of East Anglia as part of the coursework of the members of the research team. The results may also be published in academic journals. You will not be identified in any of these reports. If you would like to receive a summary of the results please indicate this on the consent form and you will need to provide your name and contact details.

What if something goes wrong?

If you are harmed by taking part in these research projects there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. The University of East Anglia has arranged insurance cover for this research. If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, you can do this through the National Health Service complaints procedure. Details of which can be obtained from the NHS website www.nhs.uk.

Will my taking part in this study be kept confidential?

Yes, all information which is collected about you during the course of the research will be kept strictly confidential. Any information about you will have your name and address removed so you cannot be identified from it.

However, there are some exceptions where we would need to break confidentiality. If you disclose something which suggests that you or others could be at risk of harm, or if there is

any suggestion of criminal activity or malpractice then the relevant persons or authorities will be informed.

Who is organising and funding the research?

The research is part of the researchers' course, the doctorate in clinical psychology at the University of East Anglia. As a Trainee Clinical Psychologist, the researchers are employed by Cambridge and Peterborough NHS Foundation Trust.

Who has reviewed the research?

All research in the NHS is looked at by an independent group of people called a Research Ethics Committee to protect your safety, rights, wellbeing and dignity. This study has been reviewed and approved by NHS Research Ethics Committee.

Contact for further information

If you wish to speak to us about the study for any reason, please do not hesitate to approach us when we next visit the obesity/weight loss clinic or contact us via the email addresses below.

Georgina Hartley (researcher and Trainee Clinical Psychologist); G.Hartley@uea.ac.uk

Stephanie Ashton (researcher and Trainee Clinical Psychologist); S.Ashton@uea.ac.uk

Dr Sian Coker (researcher's primary supervisor and clinical lecturer): S.Coker@uea.ac.uk

Dr Gillian Todd (researcher's second supervisor and clinical lecturer): G.Todd@uea.ac.uk

Please initial box

I have read and understand the information sheet for these projects. ☐

I am happy for my contact details to be passed on to the researchers so that they can contact me about taking part in either of these research projects. ☐

Name.....

Contact Phone number.....

Best time to be contacted.....

Address.....

.....

.....

Thank you. Please return this to the weight loss clinic

Appendix I

Version 6
27/10/11

Cambridge University Hospitals NHS
NHS Foundation Trust

University of East Anglia

CONSENT FORM

Study 1: Questionnaires

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton

Please initial box

1. I have read and understand the information sheet for this project ☐

2. I understand that I do not have to take part and that I can stop being in the project at any time without giving any reasons. I understand that if I do decide to stop the project, this will not affect the help I am given at the obesity/weight loss clinic now or in the future. ☐

3. I understand that small sections of my medical notes may be looked at by members of the research team to obtain my height and weight, where it is relevant to my taking part in research. I give permission for these individuals to have access to this section of my records. ☐

4. I have had the opportunity to ask questions. ☐

5. I agree to take part in the project. ☐

Participant

Name:	Signature:	Date:
.....	.....	.....

Researcher

Name:	Signature:	Date:
.....	.....	.....

If you wish to receive feedback on the results of the study, please include your name and contact details here.

Name.....

Address.....
.....
.....

Thank you. Please return this consent form with your completed questionnaires to the clinic or in the SAE provided.

University of East Anglia

CONSENT FORM

Study 1: Questionnaires

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton

Please initial box

1. I have read and understand the information sheet for this project ☐

2. I understand that I do not have to take part and that I can stop being in the project at any time without giving any reasons. I understand that if I do decide to stop the project, this will not affect the help I am given at the obesity/weight loss clinic now or in the future. ☐

3. I understand that small sections of my medical notes may be looked at by members of the research team to obtain my height and weight, where it is relevant to my taking part in research. I give permission for these individuals to have access to this section of my records. ☐

4. I have had the opportunity to ask questions. ☐

5. I agree to take part in the project. ☐

Participant

Name:	Signature:	Date:
.....	.....	.....

Researcher

Name:	Signature:	Date:
.....	.....	.....

If you wish to receive feedback on the results of the study, please include your name and contact details here.

Name.....

Address.....
.....
.....

Thank you. Please return this consent form with your completed questionnaires to the clinic or in the SAE provided.

Appendix J

Version 2

28/04/11

University of East Anglia

CONSENT FORM FOR INTERVIEW

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton

Please initial box

1. I have read and understand the information about the interview. ☐
2. I understand that I do not have to take part in the interview and that I can stop the interview at any time without giving any reasons. I understand that if I decide to stop being interviewed, this will not affect the help I am given at Addenbrooke's obesity clinic either currently or in the future. ☐
3. I agree to be contacted about taking part in the interview. ☐

Name: .....

Signature: .....

Contact Phone Number:.....

Thank you. Please return this consent form with your completed questionnaires to Addenbrooke's obesity clinic or in the SAE provided.

Cambridge University Hospitals NHS
NHS Foundation Trust

University of East Anglia

CONSENT FORM

Study 2; Interview

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton

Please initial box

1. I have read and understand the information about the interview. ☐

2. I understand that I do not have to take part in the interview and that I can stop the interview at any time without giving any reasons. I understand that if I decide to stop being interviewed, this will not affect the help I am given at the obesity/weight loss clinic either currently or in the future. ☐

3. I understand that the interview will be audio recorded and transcribed and I will be given the option to read through the transcript of my interview. ☐

4. I understand that the final report will contain some direct quotes from the interviews, but all quotes will be anonymised, and so it will not be possible to personally identify me. ☐

5. I have had the opportunity to ask questions about the interview. ☐

6. I agree to take part in the interview. ☐

Participant

Name:	Signature:	Date:
.....	.....	.....

Researcher

Name:	Signature:	Date:
.....	.....	.....

Thank you. Please return this consent form to the clinic or in the SAE provided.

University of East Anglia

CONSENT FORM

Study 2; Interview

Title of project: Thinking styles and beliefs in obesity and binge eating

Name of researchers: Georgina Hartley and Stephanie Ashton

Please initial box

1. I have read and understand the information about the interview. ☐

2. I understand that I do not have to take part in the interview and that I can stop the interview at any time without giving any reasons. I understand that if I decide to stop being interviewed, this will not affect the help I am given at the obesity/weight loss clinic either currently or in the future. ☐

3. I understand that the interview will be audio recorded and transcribed and I will be given the option to read through the transcript of my interview. ☐

4. I understand that the final report will contain some direct quotes from the interviews, but all quotes will be anonymised, and so it will not be possible to personally identify me. ☐

5. I have had the opportunity to ask questions about the interview. ☐

6. I agree to take part in the interview. ☐

Participant

Name:	Signature:	Date:
.....	.....	.....

Researcher

Name:	Signature:	Date:
.....	.....	.....

Thank you. Please return this consent form to the clinic or in the SAE provided.

Appendix L

NHS
National Research Ethics Service
NRES Committee East of England - Essex
East of England Rec Office 1
Victoria House
Capital Park
Fulbourn
Cambridge
CB21 5XB
Telephone: 01223 597693
Facsimile: 01223 597645

29 November 2011

Dr Gillian Todd
Senior Lecturer in Cognitive Behavioural Therapy, University of East Anglia
University of East Anglia
Postgraduate Research Office, Elizabeth Fry Building
Faculty of Medicine and Health Sciences
University of East Anglia, Norwich
NR4 7TJ

Dear Dr Todd

Study title: **An investigation in to metacognitions, negative self beliefs,positive and negative beliefs about eating, weight and shape concerns and differences in the use of metacognitive control strategies reported in obese people with binge eating and binge eating disorder compared to obese people without binge eating and binge eating disorder.**

REC reference: **11/EE/0401**

Thank you for your letter of 09 November 2011, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation [as revised], subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS sites

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Advertisement	"Would you like to take part in a research project?" Version 3	06 August 2011
Evidence of insurance or indemnity	- Zurich Municipal	28 June 2011
Evidence of insurance or indemnity	- UEA	23 August 2011
Interview Schedules/Topic Guides	- Metacognitive Profiling Interview Schedule	
Investigator CV	- Dr Gillian Todd	
Other: CV for Academic Supervisor (2) - Sian Coker		
Other: CV for Student - Georgina Hartley		09 September 2011
Other: CV for Student - Stephanie Ashton		26 July 2011
Other: Reply Slip		
Other: Thanks for volunteering/No thank you letter	1.0	07 November 2011
Participant Consent Form: Study 1 Questionnaire	4.0	27 October 2011
Participant Consent Form: Study 2 Interview	4.0	27 October 2011
Participant Information Sheet: Addenbrooke's Obesity Clinic	4.0	27 October 2011
Participant Information Sheet: Community Weight Loss Service	5.0	27 October 2011
Protocol	4.0	27 October 2011
Questionnaire: Eating Questionnaire		
Questionnaire: Meta-Cognitions Questionnaire 30		

Questionnaire: Thought Control Questionnaire		
Questionnaire: Hospital Anxiety Depression Scale (HADS)		
Questionnaire: Thoughts Questionnaire		
Questionnaire: Beliefs Questionnaire		
Questionnaire: Demographic Information Form	Version 3	06 August 2011
Questionnaire: DSM-IV Diagnostic criteria for BINGE EATING DISORDER		
Questionnaire: YSQ-SI		
REC application	Submission code: 82969/244864/1/144	28 July 2011
Response to Request for Further Information		09 November 2011

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

11/EE/0401	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

p.p.

Dr Alan Lamont
Chair

Email: suzanne.emerton@eoe.nhs.uk

Enclosures: "After ethical review – guidance for researchers"

Copy to: Mrs Sue Steel

Stephen Kelleher

Appendix M

Cambridge University Hospitals NHS
NHS Foundation Trust

Research and Development Department

R&D ref: A092453

11 January 2012

Box 277
Addenbrooke's Hospital
Hills Road
Cambridge
CB2 0QQ

Direct Dial: 01223 596371 Ext 6371

Switchboard: 01223 245151

E-mail:rachel.kyd@addenbrookes.nhs.uk
r&denquiries@addenbrookes.nhs.uk
www.addenbrookes.org.uk

Dr Adrian Park
Cambridge University Hospitals NHS Foundation Trust
Wolfson Diabetes & Endocrine Centre
Box 281
Addenbrooke's Hospital

Dear Dr Park

Re: 11/EE/0401 An investigation in to metacognitions, negative self beliefs,positive and negative beliefs about eating, weight and shape concerns and differences in the use of metacognitivecontrol strategies reported in obese people with binge eating and binge eating disorder compared to obese peoplewithout binge eating and binge eating disorder.

In accordance with the Department of Health's Research Governance Framework for Health and Social Care, all research projects taking place within the Trust must receive a favourable opinion from an ethics committee and approval from the Department of Research and Development (R&D) prior to commencement.

R&D have reviewed the documentation submitted for this project, and has undertaken a **site specific assessment** based on the information provided in the SSI form, and I am pleased to inform you that we have no objection to the research proceeding within Cambridge University Hospitals NHS Foundation Trust.

Sponsor: University of East Anglia

Funder: No Funding

End date: 01/10/2012

Protocol: version 4 dated 27/10/11

The project must follow the agreed protocol and be conducted in accordance with all Trust Policies and Procedures especially those relating to research and data management.

You and your research team must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice and the Data Protection Act 1998 and are aware of your responsibilities in relation to the Human Tissue Act 2004, Good Clinical Practice, the NHS Research Governance Framework for Health and Social Care, Second Edition April 2005 and any further legislation released during the time of this study.

Members of the research team must have appropriate substantive or honorary contracts with the Trust prior to the study commencing. Any additional researchers who join the study at a later stage must also hold a suitable contract.

If the project is a clinical trial under the European Union Clinical Trials Directive the following must also be complied with:

- the EU Directive on Clinical Trials (Directive 2001/20/EC) and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Regulations 2004;

- the EU Directive on Principles and Guidelines for Good Clinical Practice (EU Commission Directive 2005/28/EC); and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Amendment Regulations 2006;

Amendments

Please ensure that you submit a copy of any amendments made to this study to the R&D Department.

Annual Report

It is obligatory that an annual report is submitted by the Chief Investigator to the research ethics committee, and we ask that a copy is sent to the R&D Department. The yearly period commences from the date of receiving a favourable opinion from the ethics committee.

Please refer to our website www.cuh.org.uk/research for all information relating to R&D including honorary contract forms, policies and procedures and data protection.

Should you require any further information please do not hesitate to contact us.

Yours sincerely

Louise Stockley
Research Governance Manager

RMG Office
Lockton House
Clarendon Road
Cambridgeshire
CB2 8FH
camstrad@cambridgeshire.nhs.uk
Direct dial: 01223 725466

6th December 2011

Miss Georgina Hartley
Cambridgeshire and Peterborough NHS Foundation Trust
Ida Darwin Hospital
Fulbourn
Cambridge
CB21 5EE

Dear Miss Hartley

Re: An investigation in to metacognitions, negative self beliefs, positive and negative beliefs about eating, weight and shape concerns and differences in the use of metacognitive control strategies reported in obese people with binge eating and binge eating disorder compared to obese people without binge eating and binge eating disorder
Re: 11/EE/0401

Your proposal has been reviewed by the Medical Director of Cambridgeshire Community Services NHS Trust.

I am pleased to inform you that Cambridgeshire Community Services NHS Trust has given permission for the following research to take place.

This permission is subject to the enclosed standard terms and conditions and conditional upon you notifying the research governance team of any changes to the study-related paperwork.

Unless we hear from you within a month of this letter, we will assume that you are abiding by these conditions.

The project must follow the agreed protocol and be conducted in accordance with Trust policy and procedures in particular in regard to data protection, health & safety and information governance standards. The research team are required to follow the reasonable instructions of the research site manager and can contact the RMG office for RMG advice or the Trust RMG lead in relation to queries on local policy.

On completion of clinical trials of interventional medicinal products/devices participants need to be aware that local Trust prescribing policy and formulary applies therefore participants cannot expect to continue on the research trial product/device on completion of the trial.

Approval is subject to adherence to the Data Protection Act 1998, NHS Confidentiality Code of Practice, the Human Tissue Act 2004, the NHS Research Governance Framework for Health and Social Care, (2nd edition) April 2005, the Mental Capacity Act and any further legislation released during the time of this study. Approval for Clinical Trials is on the basis that they are conducted in accordance with European Union Directive and the Medicines for Human Use (Clinical Trials) Regulations 2004 principles, guidelines and later revisions, and in accordance ICH Good Clinical Practice.

Members of the research team must where instructed have appropriate substantive or honorary research contracts or letters of access with the Trust prior to commencing work on the study, additional researchers who join the study must also hold a suitable contract or letter of access before they start.

You will be required to complete monitoring information during the course of the research, as requested by the RMG office. Cambridgeshire Community Services NHS Trust reserves the right to withdraw research management approval for a project if researchers fail to respond to audit and monitoring requests.

Should any adverse incidents occur during the research, Cambridgeshire Community Services NHS Trust Incident and Near Miss Reporting Policy should be used, the RMG Office informed and incident procedures adhered to at the research site.

If you make any amendments to your project, please ensure that these are submitted to the research ethics committee and the RMG office and that any changes are not implemented until approval has been received.

We welcome feedback about your experience of this review process to help us improve our systems. May I take this opportunity to wish you well with your research and we look forward to hearing the progress and outcomes for the study.

Please contact the RMG team should you have any queries.

Yours sincerely,

Dr David Vickers
Medical Director
Cambridgeshire Community Services NHS Trust

cc: Mrs Sue Steel

Appendix N

Cambridge University Hospitals NHS
NHS Foundation Trust

Research and Development Department

Box 277
Addenbrooke's Hospital
Hills Road
Cambridge
CB2 0QQ

R&D Manager: Stephen Kelleher
stephen.kelleher@addenbrookes.nhs.uk
01223 217418

R&D HR Manager: Debbie Richards
01223 274660
deborah.richards@addenbrookes.nhs.uk

R&D Administrator: Sarah Boxell
01223 596395
sarah.boxell@addenbrookes.nhs.uk

Ms Georgina Hartley
Trainee clinical Psychologist
Ida Darwin Hospital
Fulbourn
Cambs
CB1 5EE

11th January 2012

Dear Georgina

Letter of access for research – A092456; Obesity, binge eating and metacognitions

As an existing NHS employee you do not require an additional honorary research contract with this NHS organisation. We are satisfied that the research activities that you will undertake in this NHS organisation are commensurate with the activities you undertake for your employer. Your employer is fully responsible for ensuring such checks as are necessary have been carried out. Your employer has confirmed in writing to this NHS organisation that the necessary pre-engagement check are in place in accordance with the role you plan to carry out in this organisation. This letter confirms your right of access to conduct research through Cambridge University Hospitals NHS Foundation Trust for the purpose and on the terms and conditions set out below. This right of access commences on 4th January 2012 and ends on 30th September 2012 unless terminated earlier in accordance with the clauses below.

You have a right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project and you have provided the Trust's R&D department with written evidence that you have completed GCP training from an EU institution before you start your research.

You are considered to be a legal visitor to Cambridge University Hospitals NHS Foundation Trust premises. You are not entitled to any form of payment or access to other benefits provided by this organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.

While undertaking research through Cambridge University Hospitals NHS Foundation Trust, you will remain accountable to your employer Cambridge and Peterborough

NHS Foundation Trust but you are required to follow the reasonable instructions of your nominated manager Dr Adrian Park and Prof. Krish Chatterjee in this NHS organisation or those given on his behalf in relation to the terms of this right of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, you are required to co-operate fully with any investigation by this NHS organisation in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

You must act in accordance with Cambridge University Hospitals NHS Foundation Trust policies and procedures, which are available to you upon request, and the Research Governance Framework.

You are required to co-operate with Cambridge University Hospitals NHS Foundation Trust in discharging its duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take reasonable care for the health and safety of yourself and others while on Cambridge University Hospitals NHS Foundation Trust premises. Although you are not a contract holder, you must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of a contract holder and you must act appropriately, responsibly and professionally at all times.

You are required to ensure that all information regarding patients or staff remains secure and *strictly confidential* at all times. Personal identifiable data must be carried securely at all times and mobile devices must be encrypted. You must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice (http://www.dh.gov.uk/assetRoot/04/06/92/54/04069254.pdf) and the Data Protection Act 1998. Furthermore you should be aware that under the Act, unauthorised disclosure of information is an offence and such disclosures may lead to prosecution. Data controllers could also be fined up to £500,000 for a breach of the Data Protection Act 1998. You must familiarise yourself with the Trust's Information Governance Code of Conduct.

You must keep confidential any information regarding the design, conduct or management or results of any research unless authorised in writing by the Trust to disclose it. You must acknowledge the Trust's contribution in any publication arising out of this Agreement.

Subject to any agreement with your employer to the contrary (e.g. as part of a multi-centre study), any Intellectual Property (IP) resulting from research carried out under this Agreement will be the property of the Trust and you will do all things necessary or desirable to give effect to the assignment of this IP.

Cambridge University Hospitals NHS Foundation Trust will not indemnify you against any liability incurred as a result of any breach of confidentiality or breach of the Data Protection Act 1998. Any breach of the Data Protection Act 1998 may result in legal action against you and/or your substantive employer.

You should ensure that, where you are issued with an identity or security card, a bleep number, email or library account, keys or protective clothing, these are returned upon termination of this arrangement. Please also ensure that while on the premises you wear your ID badge at all times, or are able to prove your identity if

challenged. Please note that this NHS organisation accepts no responsibility for damage to or loss of personal property.

We may terminate your right to attend at any time either by giving seven days' written notice to you or immediately without any notice if you are in breach of any of the terms or conditions described in this letter or if you commit any act that we reasonably consider to amount to serious misconduct or to be disruptive and/or prejudicial to the interests and/or business of this NHS organisation or if you are convicted of any criminal offence.
Your substantive employer is responsible for your conduct during this research project and may in the circumstances described above instigate disciplinary action against you.

INDUCTION AND MANDATORY TRAINING
You are responsible for familiarising yourself with the Trust's policies and mandatory training courses such as Moving and Handling, Health and Safety, Fire Training etc and be aware of the responsibility to maintain a safe environment for patients, staff and visitors

Your host Manager will ensure that you receive a comprehensive Departmental Induction. She/he will also provide you with details of Corporate Induction, research specific induction and annual Mandatory Refresher Training.

If your letter of access is for more than 3 months, you must attend Corporate Induction. Where your letter of access is for more that 12 months, you must attend annual Mandatory Refresher Training.

If your circumstances change in relation to your health, criminal record, professional registration or any other aspect that may impact on your suitability to conduct research, or your role in research changes, you must inform the NHS organisation that employs you through its normal procedures. You must also inform your nominated manager in this NHS organisation.

Yours sincerely

Stephen Kelleher
R&D Manager, Cambridge University Hospitals NHS Foundation Trust

cc: Prof K. Chatterjee, Clinical Director, Diabetes and Endocrinology
Dr Adrian Park, Study PI
Sue Moncrief, Business Manager (Recruitment and training), ASP

Enc: P6 form to confirm Letter of Access issued

Cambridgeshire Community Services NHS Trust: providing services across Cambridgeshire, Peterborough, Luton and Suffolk

12th January 2012
Miss Georgina Hartley,
Cambridgeshire & Peterborough Foundation Trust,
Ida Darwin Hospital,
Fulborn,
Cambridge,
CB1 5EE.

C/o RMG Office
NHS Cambridgeshire
Lockton House
Clarendon Road
Cambridge
Cambs
CB2 8FH

Dear Miss Hartley

Letter of access for research

As an existing NHS employee you do not require an additional honorary research contract with this NHS organisation. We are satisfied that the research activities that you will undertake in this NHS organisation are commensurate with the activities you undertake for your employer. Your employer is fully responsible for ensuring such checks as are necessary have been carried out. Your employer has confirmed in writing to this NHS organisation that the necessary pre-engagement check are in place in accordance with the role you plan to carry out in this organisation. This letter confirms your right of access to conduct research through Cambridgeshire Community Services NHS Trust for the purpose and on the terms and conditions set out below. This right of access commences on **1st January 2012** and ends on **30th September 2012** unless terminated earlier in accordance with the clauses below.

You have a right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project.

You are considered to be a legal visitor to Cambridgeshire Community Services NHS Trust premises. You are not entitled to any form of payment or access to other benefits provided by this organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.

While undertaking research through Cambridgeshire Community Services NHS Trust you will remain accountable to your employer, **Cambridgeshire & Peterborough Foundation Trust**, but you are required to follow the reasonable instructions of your nominated manager, Dr David Vickers Medical Director, this NHS organisation or those given on his behalf in relation to the terms of this right of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, you are required to co-operate fully with any investigation by this NHS organisation in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

You must act in accordance with Cambridgeshire Community Services NHS Trust policies and procedures, which are available to you upon request, and the Research Governance Framework. You are required to co-operate with Cambridgeshire Community Services NHS Trust in discharging its duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take reasonable care for the health and safety of yourself and others while on Cambridgeshire Community Services NHS Trust premises. Although you are not a contract holder, you must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of a contract holder and you must act appropriately, responsibly and professionally at all times.

You are required to ensure that all information regarding patients or staff remains **secure and strictly confidential** at all times. You must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice (http://www.dh.gov.uk/assetRoot/04/06/92/54/04069254.pdf) and the Data Protection Act 1998. Furthermore you should be aware that under the Act, unauthorised disclosure of information is an offence and such disclosures may lead to prosecution.

Cambridgeshire Community Services NHS Trust will not indemnify you against any liability incurred as a result of any breach of confidentiality or breach of the Data Protection Act 1998. Any breach of the Data Protection Act 1998 may result in legal action against you and/or your substantive employer. You should ensure that, where you are issued with an identity or security card, a bleep number, email or library account, keys or protective clothing, these are returned upon termination of this arrangement. Please also ensure that while on the premises you wear your ID badge at all times, or are able to prove your identity if challenged. Please note that this NHS organisation accepts no responsibility for damage to or loss of personal property.

We may terminate your right to attend at any time either by giving seven days' written notice to you or immediately without any notice if you are in breach of any of the terms or conditions described in this letter or if you commit any act that we reasonably consider to amount to serious misconduct or to be disruptive and/or prejudicial to the interests and/or business of this NHS organisation or if you are convicted of any criminal offence. Where applicable, your substantive employer will initiate your Independent Safeguarding Authority (ISA) registration in-line with the phasing strategy adopted within the NHS and the applicable legislation. Once you are ISA-registered, your employer will continue to monitor your ISA registration status via the on-line ISA service. Should you cease to be ISA-registered, this letter of access is immediately terminated. Your substantive employer will immediately withdraw you from undertaking this or any other regulated activity and you MUST stop undertaking any regulated activity.

Your substantive employer is responsible for your conduct during this research project and may in the circumstances described above instigate disciplinary action against you.

If your circumstances change in relation to your health, criminal record, professional registration or ISA registration, or any other aspect that may impact on your suitability to conduct research, or your role in research changes, you must inform the NHS organisation that employs you through its normal procedures. You must also inform your nominated manager in this NHS organisation.

Yours sincerely

Dr David Vickers
Medical Director
Cambridgeshire Community Services NHS Trust

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Appendix O

Exert from a coded interview transcript with P1 (binge eating group)

Codings

I: And so when you pick it up then what sort of thoughts do you have?

P1: It's more of just gotta have it, gotta have it, gimme gimme gimme gimme and it's really strange because even as I'm eating it I'm not tasting it

Focus of attention, not focused on taste of food. Focused on effects food will have. Need to eat.

I: No

P1: It's just shoving it in, you know gotta get it in

Codings

I: Do you think, do you think you have any kind of positive thoughts about why you're doing it at all?

Positive thoughts about food and eating; regulate emot

External focus of attention

'this

what I don't want to feel'

P1: Not at the thought, but I do, I think there's positive thoughts at a um conscious level but I think at a conscious level there is a 'this will stop me feeling what I don't want to feel'

Distraction

I: Right ok

Attention focussed on emotions, internal focus.

P1: You know that it's very much it is it's stuffing down the emotion you're putting a lid on the emotion by chucking all this food in the way, which is, kind of insane really but

Trying to cap emotions, suppress them.

I: Ok so you're kind of in the middle of it and you're thinking I've gotta eat this, I've gotta eat it, and then what happens next?

No memories triggered.

Punish self mentally

P1: Then it's kind of oh shit what have I done again (Both laugh) you know, what, what, why the hell did I do that? It hasn't you know, in the end it hasn't made the thing I'm worrying about go away but it's yeah, it's a kind of guilt feeling really it's it's it's a guilt and it's a real discomfort at the idea of the loss of control

Emotional response

Loss of control

No identifiable triggers for eating, only taste

Exert from a coded interview transcript with P8 (non-binge eating group)

I: when you are eating what are you paying most attention to?

P8: Not getting it down me shirt, that's the main thing or the TV when I'm at home

I: Ok

P8: I just sort of sit there and watch the world go by, we have a lot of foreigners working there and I can't understand what they say a lot of the time. I try to talk to them but they go off and have their conversation in Latvian, sit there laughing and that and I will be up the corner on my own, it's a bit umm, I don't really pay attention to anything

I: Ok

P8: Crisps, certain flavours I enjoy more than others but no it is not that

I: So when you're eating quite a large amount, do any memories come to mind?

P8: No

I: So nothing that sort of triggers, like making you want to eat or making you want certain foods, sort of like triggering how you are feeling and what you are thinking at all about when you're eating?
P8: The only thing I can say is some things are nicer than others aren't they, it's not a memory or anything it triggers, it's just "this is nice, I will carry on eating this"

I: Do you try to make the thoughts go away, like say you are thinking about having another packet of crisps do you try to make it

Attention focused on work, not food all of the time

P8: I don't think about them all day, if I am working I ain't thinking about food, I'm thinking about work

Exert from a coded interview transcript with P81 (non-binge eating group)	**Codings**
I: Yeah, but in the situation when you're	
P8: I don't really think about anything else, I just sort of have to tell myself to stop	Feels able to control thoughts
P: I think about cars or something, or try to do something, like try to pick up an old newspaper to read or something, to take your mind off it	Distraction
I: Do you, some people will try to remember food that they want, so say you were sat in here and you knew there were some chips in the kitchen that you were really tempted by, some people will try to keep remembering the chips, deliberately so that they feel more in control of being able to not eat them. Does that make sense?	
P8: Yeah	
I: Do you ever do that?	
P8: No no, it is either I have them or I don't, there is no	No need to control thoughts
I: No	
I: And if you did eat something that you thought you shouldn't have, or tried to stop yourself from, do you sort of, this is another thing that lots of people do, do you punish yourself afterwards, like beat yourself up, or think bad thoughts about yourself	
P8: I suppose I think that's another half hour in the gym, well not even in the gym as I don't go down the gym, I suppose you feel bad afterwards for eating it but I don't think I beat myself up	Do not punish self mentally
I: You don't think bad things about yourself?	
P8: No, not really	

Appendix P

Initial template for participants with obesity and binge eating or BED.

2. Metacognitive knowledge

2.3 Metacognitive beliefs

2.3.1 Positive

2.3.1.1 Functional - regulates emotions

2.3.1.2 Worry reduces binge eating

2.3.2 Negative

2.3.2.1 Uncontrollability

2.3.2.2 Harm

2.3.3 Contradictory positive and negative beliefs co-exist

2.4 (Metacognitive) Appraisals

2.4.1 Lack of mental control

2.4.2 Low cognitive confidence

2.4.2.1 Less confidence in memories??

2.4.2.2 Less confident in ability to discriminate between action and memories??

2.4.2.3 Less confident in ability to keep attention un-distracted??

2.4.3 The need to control thoughts –

2.4.4 Heightened cognitive self-consciousness

2.4.4.1 Question own thoughts

2.4.4.1.1 Illogical answers

2.4.5 Goals

2.4.5.1 Not met

2.4.5.2 Not identified/ inconsistent

2.4.6 Emotional response

3 Metacognitive processes

2.3 Memories triggered - mood dependent retrieval??

2.3.1 Negative memories

2.3.1.1 Social judgements

2.4 Selective attention allocation

2.4.1 Attend to rumination more?? - Past orientated??

2.4.2 Self-focussed.

2.4.2.1 Attention on thoughts – intrusive, obsessive, overwhelming.

not on food taste, texture etc.

2.4.2.2 Attention to emotion

2.4.3 Attention to others?

2.5 Biases in forming judgements - how feel about self

2.5.1 Judgements influenced by feelings

2.5.2 Judgements influenced by memories

4. Metacognitive thought control strategies

3.5 Rumination/worry

3.5.1.1 Intrusive? Past orientated?

3.6 Self punishment

3.7 Suppression – *unsuccessful*,

3.8 Unsuccessful reappraisal

3.9 Distraction

3.10 Low social control

3.10.1 Realisations

3.10.2 Secretive bingeing

Initial template for participants with obesity without binge eating or BED.

4. Metacognitive knowledge

    1.4 Dismissable

    1.5 Absence of positive and negative beliefs about worry

    1.6 High cognitive confidence

    1.7 Little need to control thoughts

    1.8 Clear goals set

        1.8.1 Specific

5. Metacognitive processes

    3.1 Memories triggered

    3.2 Not selective attention allocation

6. Metacognitive thought control strategies

    1.9 Distraction