Eating Disorders and Obsessive-Compulsive Disorder: An Examination of Overlapping Symptoms, Obsessive Beliefs, and Associated Cognitive Dimensions

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Psychology

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Declaration of Authorship

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and ethics procedures and guidelines have been followed.

Signed:

________________________
Adrian Schembri

Date:
Acknowledgments

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**Dissemination Information**

Sections of this thesis have been disseminated as conference presentations. The candidate has taken primary authorship on the papers and supervisors have been co-authors (Associate Professor David Smith, Professor Susan Paxton, Ms Trish Altieri).


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Glossary of Terms

AN: Anorexia Nervosa
AN-Binge Eating/Purging: Anorexia Nervosa – Binge Eating/Purging Subtype
ANOVA: Analysis of Variance
AN-Restricting: Anorexia Nervosa – Restricting Subtype
BCCS: Body Checking Cognitions Scale
BCQ: Body Checking Questionnaire
BDI: Beck Depression Inventory
BED: Binge Eating Disorder
BMI: Body Mass Index
BN: Bulimia Nervosa
BN-Non-Purging: Bulimia Nervosa – Non-Purging Subtype
BN-Purging: Bulimia Nervosa – Purging Subtype
DASS: Depression, Anxiety, Stress Scale
DSM-IV: Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition
DSV-IV-TR: Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition – Text Revision
EAT: Eating Attitudes Test
EDE: Eating Disorder Examination
EDE-Q: Eating Disorder Examination – Questionnaire
EDI: Eating Disorders Inventory
EDNOS: Eating Disorder Not Otherwise Specified
GAD: Generalised Anxiety Disorder
GP: General Practitioner
HEC: Human Ethics Committee
HREC: Human Research Ethics Committee
III: Interpretation of Intrusions Inventory
LEDBs: Lifetime Eating Disorder Behaviours
MANOVA: Multivariate Analysis of Variance
MOCI: Maudsley Obsessive-Compulsive Inventory
MPS-F: Multidimensional Perfectionism Scale - Frost
MPS-H: Multidimensional Perfectionism Scale - Hewitt
MVA: Missing Value Analysis
OBE: Objective Binge Episode
OBQ-44: Obsessive-Beliefs Questionnaire
OBQ-87: Obsessive Beliefs Questionnaire
OBQ-EDV: Obsessive Beliefs Questionnaire – Eating Disorder Version
OCCWG: Obsessive-Compulsive Cognitions Working Group
OCD: Obsessive-Compulsive Disorder
OCI: Obsessive-Compulsive Inventory
OCI-R: Obsessive-Compulsive Inventory – Revised
OCPD: Obsessive-Compulsive Personality Disorder
PTSD: Post Traumatic Stress Disorder
RIPE: Recovery is Possible
ROC: Receiver Operating Characteristic
SBE: Subjective Binge Episode
SPSS: Statistical Package for the Social Sciences
TAF: Thought-Action Fusion
TSF: Thought-Shape Fusion
YBOCS: Yale-Brown Obsessive-Compulsive Scale
Abstract

For over half a century, researchers and practitioners have documented the statistical comorbidity and overlapping symptom presentation between eating disorders and obsessive-compulsive disorder (OCD). Recent research by the Obsessive-Compulsive Cognitions Working Group (OCCWG) has identified cognitive dimensions salient to OCD, which has prompted researchers to investigate the incidence of obsessive-compulsive cognitions among eating disorder populations. Six beliefs have been identified by the OCCWG, including overestimation of threat, inflated responsibility, perfectionism, intolerance of uncertainty, importance of thoughts, and the need to control thoughts. The aim of the current research was to extend current literature and examine the overlapping and distinguishable features of eating disorders and OCD, placing particular emphasis on cognitions. Obsessive beliefs identified by the OCCWG were compared across diagnostic groups (e.g., eating disorders, OCD, depression) and a community control group. In addressing whether obsessive beliefs among women with eating disorders are specific to the domains of eating, shape, and weight, a new measure was developed. This measure was based on self-report assessments developed by the OCCWG, however in the newly developed measure, items were tailored specifically to the domains of eating, body shape, and weight.

Eating and anxiety disorder clinics and associations throughout Australia (e.g., The Bronte Centre at St. Vincent’s, the Oak House, the Eating Disorders Foundation of Victoria, and the Anxiety Disorders Association of Victoria) assisted with recruitment for this research. A total sample of 1207 Australian women, aged between 18 and 69 years, was recruited to participate. Participants incorporated both a community and clinical sample, with the clinical sample consisting of 100 women with an eating disorder, 21 with OCD, and 49 with depression. Women with a self-reported history of other Axis I and Axis II DSM-IV disorders were also recruited, however insufficient samples were available to form clinical comparison groups for these forms of
psychopathology. Each participant completed a questionnaire package containing a series of self-report measures of eating disorder and OCD symptomatology, obsessive beliefs, self-esteem, body checking behaviours and cognitions, and general symptoms of depression and anxiety.

Findings of this research are presented across four studies. The first study examined the overlap between eating disorder and obsessive-compulsive symptomatology, with a focus on differences in symptoms across diagnostic categories and whether eating disorder symptoms are associated with subtypes of obsessions or compulsive behaviour. Results indicated that higher scores on a measure of eating pathology were associated with elevated obsessive-compulsive symptoms, particularly on the checking, ordering, obsession, hoarding and mental neutralisation symptom domains of OCD. Findings also revealed that the higher the frequency of disordered eating behaviour, the greater the likelihood of obtaining scores of OCD in the clinical range.

The second study examined the presence and severity of obsessive beliefs, as measured by the Obsessive Beliefs Questionnaire (OBQ-44), in an eating disorder sample. Moderate to strong associations were found between eating disorder symptoms and general obsessive beliefs. Consistent with previous research, scores on the OBQ-44 were equivalent across clinical groups. Analysis of covariance revealed that a greater proportion of variance in obsessive beliefs was accounted for by obsessive-compulsive symptoms for those women with OCD when compared with their counterparts with an eating disorder or depression.

Study 3 introduced a new measure of obsessive beliefs that was developed and psychometrically tested for the purposes of the current research. The Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV) was designed to provide a measure of obsessive beliefs that was specific to the domains of eating, shape, and weight, given the breadth of research documenting that concerns over shape and

\[ \text{...} \]
weight constitute the core symptomatology underlying eating disorders. The factor structure of the OBQ-EDV was found to be largely consistent with that of the OBQ-44. Item analysis and internal consistency coefficients yielded encouraging results, whilst preliminary investigation of the face, content, criterion-related, and construct validity of the OBQ-EDV was also promising.

The final study investigated scores on the newly developed OBQ-EDV across clinical and community-based groups. Women with an eating disorder scored higher on the OBQ-EDV total score than the OCD, depression, and community control groups. Women with anorexia nervosa were found to have mildly higher scores on the OBQ-EDV when compared with their counterparts with bulimia nervosa, however a lack of statistical power due to a small sample size precluded the emergence of any statistically significant findings. Eating, shape, and weight specific obsessive beliefs were found to mediate the relationship between general obsessive beliefs (as measured by the OBQ-44) and eating disorder symptoms.

In the context of these findings, implications and recommendations for clinical practice are discussed. Directions for future research are also presented, including replication of the current work given that very few studies have examined obsessive beliefs in the context of eating disorders, despite well established relationships between eating disorders and OCD. It is argued that further research is necessary to provide a more concrete rationale for the acknowledgment of obsessive beliefs in treatment models for eating disorders. Findings of the current study provide further support for researchers and practitioners working in the eating disorder field to remain cognisant of the presence of obsessive-compulsive cognitions in this clinical population.
Chapter 1
Introduction and Aims of the Current Research

Theorists advocate that eating disorders maintain several overlapping features with Obsessive-Compulsive Disorder (OCD; Godart, Flament, Lecrubier, & Jeammet, 2000; Godart, Flament, Perdereau, & Jeammet, 2002; Halmi et al., 1991; Shafran, 2002; Swinburne & Touyz, 2007). Although research on eating disorders and OCD has been extensive, the designs, methodologies, and samples incorporated within these studies have varied considerably (Godart et al., 2003; Keel, Haedt, & Edler, 2005). Such variation has generated controversy surrounding the theoretical models underlying disordered eating and whether cognitive factors such as obsessive beliefs predate the emergence of an eating disorder, strengthen an individual’s vulnerability to developing an eating disorder, or heighten resistance to treatment (Bastiani et al., 1996; Thiel, Zuger, Jacoby, & Schubler, 1998). Much of the research on eating disorders and OCD to date has focused on the high prevalence of OCD among individuals with Anorexia Nervosa (AN) and Bulimia Nervosa (BN), and on the temporal relationship between these conditions (Godart et al., 2000; Godart et al., 2006b; Halmi et al., 1991; Thiel, Broocks, Ohlmeier, Jacoby, & Schubler, 1995; Thornton & Russell, 1997; Wagner et al., 2006). However, with the recent shift in the literature towards psychological aspects of comorbidity (Rachman, 1991), researchers have emphasised a need to move beyond examination of overlapping prevalence rates, and focus on identification of cognitive styles and thought patterns that are common among disorders (Shafran, 2002). Researchers acknowledge that a greater understanding of the cognitive constructs underlying eating disorders will improve the effectiveness of intervention programs in this area and may also have implications for prevention (Mountford, Haase, & Waller, 2006; OCCWG, 2003, 2005; Shafran, 2002).

The aim of the current research was to extend current literature and examine the overlapping and distinguishable features of eating disorders and OCD, placing
particular emphasis on cognitions. Much of the research on OCD over the past decade has been conducted by the Obsessive-Compulsive Cognitions Working Group (OCCWG), a team of researchers who have identified several cognitions that are now considered fundamental in the development and perpetuation of obsessive-compulsive symptoms. Six cognitions have been acknowledged by this research group, including perfectionism, intolerance of uncertainty, overestimation of threat, inflated responsibility to prevent perceived catastrophes, and the tendency to overestimate the importance of thoughts and the subsequent need to control thoughts. Items that measure each of these dimensions have been incorporated into a recently developed measure of obsessive beliefs, the Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2005). In the current research, cognitive dimensions measured by the OBQ-44 are examined among an adult female community sample, and a clinical sample of adult women presenting with an eating disorder.

The current research also aimed to compare obsessive beliefs identified by the OCCWG across diagnostic groups (e.g., eating disorders, OCD, depression) and identify whether differences in obsessive beliefs exist across the diagnostic categories of eating disorders (e.g., AN, BN, and Eating Disorder Not Otherwise Specified [EDNOS]). In addressing whether obsessive beliefs are specific to the domains of eating, shape, and weight, an equivalent measure to the OBQ-44 was constructed, with items tailored specifically to concerns about eating, shape, and weight. Obsessive beliefs across general and eating disorder specific domains could then be compared. Relationships between obsessive beliefs and variables pertinent to the development and maintenance of eating disorders were also addressed. These included concerns relating to eating, shape, and weight; body checking behaviours; self-oriented and socially prescribed perfectionism; and self-esteem. It was hoped that the current research would identify whether obsessive beliefs such as intolerance of uncertainty, overestimation of threat, and inflated responsibility contribute to pathological eating
behaviours and whether these beliefs are restricted to the domains of eating, shape, and weight.

Based on these aims, Chapter 2 briefly describes the general categories of eating disorders and the diagnostic crossover that is evident among eating disorders. A functional analysis of eating disorder symptoms is provided, with considerable attention being drawn to established links between eating disorders and concerns over shape and weight, body checking, self-esteem, and depressive symptoms.

Chapter 3 provides a summary of statistical comorbidity studies on eating disorders and OCD, including reported comorbid prevalence across each eating disorder category and subtype. Phenomenological similarities between eating disorders and OCD are discussed, focusing specifically on cognitions and interactions between cognitions and behavioural symptoms. The cognitive styles that have recently been identified by the OCCWG and their role in the etiology and maintenance of eating disorders will be presented, with a focus on the paucity of research in this area.

Chapter 4 summarises the missing links in the literature, which will substantiate the need for further research and provide a rationale for the current series of studies.

Chapter 5 provides details of the method incorporated in the current research, in which 1207 adult women completed a self-report questionnaire seeking information about clinical diagnostic information, current eating disorder and OCD symptomatology, and measures of obsessive beliefs, body checking behaviours and cognitions, multidimensional perfectionism, self-esteem, and general symptoms of depression and anxiety. A detailed description of data preparation and screening of data, and classification of participants into clinical and community control groups is presented in Chapter 6. Findings of this research are presented across four research studies, with results and discussion of each study being provided in Chapters 7 to 10. A general discussion of findings with regards to research and treatment implications, limitations of the current research, and directions for future research is provided in Chapter 11.
Chapter 2
Introduction to Eating Disorders

Diagnostic Criteria and Classification of Eating Disorders

**Anorexia Nervosa (AN).** Although the eating disorder categories have overlapping symptomatology, they are each characterised by distinguishable symptom patterns that facilitate diagnosis (Wade, Bergin, Martin, Gillespie, & Fairburn, 2006a; Wilson, 2005). AN is associated with a refusal to maintain normal body weight, and engagement in restrictive eating behaviours resulting from an intense fear of gaining weight. Individuals with AN retain a body weight that is less than 85% of that expected (based on their age and height) and also experience phases of amenorrhea, which is the absence of menstruation for at least three consecutive cycles (American Psychiatric Association, 2000; Wilson, 2005). There are two subtypes of AN incorporated within the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV-TR). These include the restricting subtype, characterised by extreme dietary restriction with no engagement in binge eating or purging behaviours, and the binge eating/purging subtype, which is associated with regular episodes of binge eating and purging (American Psychiatric Association, 2000). Refer to Appendix A for a summary of the current DSM-IV-TR diagnostic criteria for AN.

According to Lucas, Beard, O’Fallon, and Kurland (1991), the peak age of onset for AN is between 15 and 19 years, whilst onset over 40 years of age is uncommon. The onset of both AN and BN have been associated with negative affect (Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006; Tykra, Waldron, Graber, & Brooks-Gunn, 2002). Lifetime prevalence estimates of AN are approximately 0.5% in females, with prevalence rates in males being around one-tenth of that reported for females (American Psychiatric Association, 2000). The incidence of AN is thought to have increased in recent decades, however research evidence has been equivocal with some studies revealing increases (Eagles, Johnston, Hunter, Lobban, & Millar, 1995;
whilst others have demonstrated more stable rates (Hoek et al., 1995; Joergensen, 1992; Nielsen, 1990; Willi, Giacometti, & Limacher, 1990). Due to the severity of health risks associated with this condition (e.g., starvation, electrolyte imbalance, suicidal ideation), AN has been associated with the highest mortality rate of any mental disorder (Harris & Barraclough, 1998; Sullivan, 1995), with mortality estimates of over 10% being reported within the literature (American Psychiatric Association, 2000). A meta-analysis by Sullivan (1995) reported mortality rates among AN patients as 5.6% per decade of follow-up.

**Bulimia Nervosa (BN).** The behavioural elements of the binge eating/purging subtype of AN are closely related to the symptoms of BN. This disorder is characterised by episodes of binge eating, which is the consumption of large amounts of food in relatively discrete periods of time. Binge episodes are typically followed by compensatory behaviours through self-induced vomiting, fasting, excessive exercise, or the consumption of diuretics or laxatives. Although individuals with BN often report a loss of control whilst eating, they generally fall within normal weight ranges since excessive food intake is balanced with compensatory behaviour. The DSM-IV-TR specifies two subtypes of BN. These include a purging and a non-purging subtype, whereby the non-purging subtype is limited to those patients that employ non-purging forms of compensatory behaviours (e.g., use of laxatives or diuretics; American Psychiatric Association, 2000). Refer to Appendix B for a summary of the current DSM-IV-TR diagnostic criteria for BN.

The lifetime prevalence of BN is greater than that of AN, and lies between 1% and 3% for females and 0.01% and 0.03% for males (American Psychiatric Association, 2000). Onset of BN is most frequently during late adolescence and early adulthood, with mortality estimates reported at 2% (Birmingham, Su, Hlynsky, Goldner,
& Gao, 2005). More often than not, a period of dieting precipitates an individual’s first episode of binge eating, with subsequent compensatory behaviours being triggered by feelings of regret, guilt, and shame (Polivy & Herman, 2002). When compared with the restricting subtype of AN, patients with BN report a greater incidence of impulsive, spontaneous, and risky behaviours such as substance abuse, promiscuity, and suicide attempts (Matsunaga et al., 2000; Wiederman & Pryor, 1996). Engaging in long periods of fasting in conjunction with high impulsivity is associated with increased susceptibility to binge eating and the development of BN or the binge eating/purging subtype of AN (Forbush, Heatherton, & Keel, 2007).

**Eating Disorder Not Otherwise Specified (EDNOS).** The final eating disorder category, EDNOS, characterises those individuals who meet some but not all criteria for AN or BN (American Psychiatric Association, 2000; Keel et al., 2005). Common EDNOS presentations include females who meet most criteria for AN whilst still maintaining a regular menstrual cycle or a weight that is within the normal range. Individuals who have engaged in binge eating and purging more than twice a week but for less than three months also meet criteria for EDNOS (American Psychiatric Association, 2000). The prevalence of EDNOS is at least double that of AN or BN, and EDNOS represents approximately 50% of individuals with an eating disorder (Shafran, 2002). Due to the variety of EDNOS presentations and the high proportion of cases that fit into this diagnostic category, subtypes of EDNOS have recently emerged within the research literature (Binford & le Grange, 2005; Keel et al., 2005; Wade, Bergin, Tiggemann, Bulik, & Fairburn, 2006b). For example, the EDNOS – purging only subtype (EDNOS-P) captures those patients who, for the purpose of maintaining control over their weight, engage in frequent purging behaviours (at least twice a week for three months) in the absence of any objective binge episodes (OBEs) (Wade, 2007). Refer to Appendix C for a summary of the current DSM-IV-TR diagnostic criteria for EDNOS.
The course of EDNOS varies greatly across patient populations (Wilson, 2005). Whilst the majority of EDNOS cases do not progress to an eating disorder, EDNOS patients present an extremely high risk of developing AN or BN on the basis that core manifestations of eating pathology (e.g., self-evaluation that is based on body shape or excessive concern over eating, shape, and weight) are already present (Wade, 2007). In addition, a subset of women with EDNOS have met full criteria for AN or BN in the past, however following a course of treatment, no longer meet full criteria for AN or BN yet maintain with residual symptoms of either disorder (American Psychiatric Association, 2000).

**Diagnostic Cross-Over and Dimensional Models of Eating Disorders.**

Despite the most prominent diagnostic texts (e.g., DSM-IV-TR; International Classification of Diseases and Related Health Problems – 10th Revision, 1994) classifying eating disorders as distinct categories, some evidence has accumulated for the classification of these disorders as dimensional constructs (Fairburn, Cooper, & Shafran, 2003a; Tozzi et al., 2005; Wade et al., 2006a; Williamson, Gleaves, & Stewart, 2005). It is now clear that a proportion of the core psychopathology underlying AN and BN are fundamentally similar, with patients of both diagnostic categories over-evaluating the importance of shape and weight (Tozzi et al., 2005; Wade et al., 2006a).

Preliminary studies into dimensional models of disordered eating utilised both cross-sectional and longitudinal research designs, and focused predominantly on the diagnostic overlap between AN and BN, and whether AN patients also met lifetime prevalence for BN (Bulik, Sullivan, Fear, & Pickering, 1997; Eckert, Halmi, Marchi, Grove, & Crosby, 1995). Studies have demonstrated that between 8% and 62% of individuals initially diagnosed with AN also develop BN (Bulik et al., 1997; Eckert et al., 1995; Eddy et al., 2002; Strober, Freeman, & Morrell, 1997), however in the majority of cases, crossover from AN to BN typically occurs during the first five years of the illness (Tozzi et al., 2005). Sullivan, Bulik, Fear, and Pickering (1998) built on this research
and compared 70 AN patients who had been assessed or treated 10 years earlier with a cohort of 98 non-clinical controls. Results indicated that 54.3% of the AN group met lifetime prevalence for BN when compared with only 2% of the comparison group. In addition, the majority of crossover occurred within two years of the initial AN diagnosis, which lead the authors to conclude that AN presented a significant risk for the development of BN (Sullivan et al., 1998).

The largest assessment of diagnostic crossover among eating disorder populations was conducted by Tozzi and colleagues (2005). These authors examined 350 AN and 88 BN patients, and assessed crossover from AN-Restricting to BN and vise versa. It was found that 36% of patients with AN-Restricting developed BN, whilst 27% of BN patients went on to develop AN-Restricting. This latter finding was surprising on the basis that previous research had estimated crossover from BN to AN as being as low as 0% to 4% (Collings & King, 1994; Fairburn et al., 1995; Fairburn, Cooper, Doll, Norman, & O’Connor, 2000; Fichter & Quadflieg, 1997; Johnson-Sabine, Reiss, & Dayson, 1992; Swift, Ritholz, Kalin, & Kaslow, 1987; Tozzi et al., 2005).

Consistent with earlier studies (Eckert et al., 1995; Eddy et al., 2002; Strober et al., 1997), 91% of the crossover between AN-Restricting and BN, and 77% of the crossover between BN and AN-Restricting, occurred within five years of developing the principal eating disorder.

Such a high overlap between eating disorder categories has prompted researchers to identify whether the conceptualisation of these disorders may be better suited to dimensional models that focus on preoccupation with eating, shape, and weight; obsessionality; and engaging in binge eating (Williamson et al., 2002, 2005). Classification models have emerged based on symptom counts and the presence or absence of certain disordered eating behaviours (Birmingham, Touyz, & Harbottle, 2009; Bulik, Sullivan, & Kendler, 2000; Wade et al., 2006a). Wade and colleagues (2006a) adopted a novel approach by examining the incidence of lifetime eating
disorder behaviours (LEDBs) among a twin cohort, and the association between LEDBs and a patient’s diagnosis, level of functioning, and impairment. LEDBs were defined as episodes of OBE, self-induced vomiting, laxative misuse, diuretic misuse, fasting, and low body weight (Body Mass Index [BMI] ≤ 17.5). Examination of these behaviours indicated that an increased number of LEDBs was associated with greater impairment in functioning. When compared with women reporting fewer than three LEDBs, those women who participated in three or more reported significantly lower self-esteem, and greater impulsivity, personal standards, concern over mistakes, doubts about actions, neuroticism, and novelty seeking. The negative linear relationship between symptom count and general functioning provided evidence for a dimensional model, since it enlightened clinicians to the severity of eating pathology as opposed to whether a patient simply met diagnostic criteria. The finding that number of LEDBs was not associated with a particular DSM-IV-TR eating disorder category provided further evidence for this contention (Wade et al., 2006a), promoting theorists to more closely examine the functional relationship between eating disorder symptoms rather than relying solely on taxonomies in formulating a clinical diagnosis.

Functional Analysis of Eating Disorder Symptomatology

Heightened concern over shape and weight is thought to typify the core psychopathology underlying eating disorders (Reas, Whisenhunt, Netemeyer, & Williamson, 2002; Shafran, Fairburn, Robinson, & Lask, 2004; Shafran, Lee, Payne, & Fairburn, 2007). These concerns are relatively stable, often precede the development of an eating disorder, and manifest in perceptual, attitudinal, and behavioural symptom clusters (Reas et al., 2002; Wade & Lowes, 2002). One behavioural symptom that has received increasing attention in recent years is body checking. Body checking behaviours include weighing, examining body parts in the mirror, using clothing sizes to evaluate body shape, examining the spread of the thighs when sitting, comparing shape and weight with that of other people, and asking others for reassurance about
body shape or weight (Haase, Mountford, & Waller, 2007; Mountford et al., 2006; Shafran et al., 2004). Until recently, body checking behaviours have been overlooked as a behavioural expression of body, shape, and weight concerns, and have been conceptualised within the umbrella of body image (Fairburn, Cooper, Doll, & Welch, 1999; Mountford et al., 2006). Theorists now advocate that body checking behaviours facilitate the maintenance of eating disorders and that repeated checking of specific body parts interacts with cognitive biases such as selective attention (Fairburn et al., 1999; Fairburn et al., 2003a). Each episode of body checking can typically last from several seconds to a few minutes, with episodes being associated with an intensification of body dissatisfaction (Mountford et al., 2006; Reas et al., 2002). This notion has been articulated by Fairburn and colleagues (1999), who reported that body checking exacerbates perceived imperfections of body shape and elevates fixations on shape and weight.

Although research on body checking in clinical eating disorder patients is accumulating, few studies have focused on how these behaviours relate to dietary restraint, cognitive biases, or concern over shape and weight (Shafran et al., 2004). Reas and colleagues (2002) found that individuals with AN, BN, or EDNOS had significantly higher scores on the Body Checking Questionnaire (BCQ) when compared with a sample of undergraduate college students. This finding has been replicated in a comprehensive study on body checking that was conducted by Shafran and colleagues (2004). This research recruited 64 participants with either AN \((n = 22)\), BN \((n = 11)\), or EDNOS \((n = 31)\), and found that whilst 92% of the sample engaged in body checking, 61% experienced periods where they actively avoided checking their bodies and only 5% reported that checking improved their mood. In addition, concerns over shape and weight were more profound in those individuals who were high on body checking, and regardless of a recent increase or decrease in weight, dietary restriction was a regular consequence of body checking (Shafran et al., 2004).
Further support for these findings has been provided in a follow-up study by Shafran and colleagues (2007) that examined the impact of body checking on a sample of 60 women without a history of an eating disorder. These authors randomly assigned participants to low and high body checking groups and asked individuals in the high body checking group to focus specifically on aspects of their body that they were dissatisfied with. It was found that body checking induced a temporary increase in body dissatisfaction (in the context of self-critical thinking and feeling overweight), which provided evidence for a causal relationship between body checking and increases in shape and weight concerns (Shafran et al., 2007). Studies of this nature have prompted researchers to evaluate the level of distress that results from body checking (Fairburn et al., 1999; Mountford et al., 2006; Shafran et al., 2007). According to Fairburn and colleagues (1999), body checking rituals may become so aversive that they eventually reduce to the point that the individual engages in body avoidance. Body avoidance behaviours may include a refusal to weigh oneself, wearing baggy clothes, or covering household mirrors. Although research in this area is limited, Shafran and colleagues (2004) found that eating disorder patients engaged in significantly more body avoidance when compared with controls. These authors also found that body avoidance behaviours served to maintain symptoms surrounding disordered eating since fears of gaining weight cannot be disconfirmed (Shafran et al., 2004).

Hypotheses regarding the function of body checking and avoidance behaviours have also been postulated (Reas et al., 2002; Rosen, 1987; Rosen, Srebnik, Saltzberg, & Wendt, 1991). Shafran and colleagues (2004) contend that body checking fails to ameliorate distress and may exacerbate feelings of inadequacy. In addition, individuals with eating disorders occasionally engage in body checking with the intention of inducing distress and increasing motivation for dietary restraint (Shafran et al., 2004). Shafran, Cooper, and Fairburn (2002) have argued that body checking and avoidance are not anxiolytic but are motivated by ego-syntonic rather than ego-dystonic
obsessions. In effect, these behaviours are consistent with the individual’s core belief system and as such, they are associated with attaining an ideal body shape and weight rather than reducing anxiety.

On the contrary, Reas and colleagues (2002) asserted that checking behaviours may have an obsessive-compulsive type relationship with body dissatisfaction, whereby body checking reduces anxiety and distress that surrounds concerns over shape and weight. Research examining the cognitions that are associated with body checking have yielded some fruitful information in support of an obsessive-compulsive type relationship. In developing the Body Checking Cognitions Scale (BCCS), Mountford and colleagues (2006) identified four cognitive biases that are associated with body checking. These include:

a) **Objective Verification**: The belief that body checking will help to obtain an accurate picture of one’s size and shape.

b) **Reassurance**: The belief that body checking will reduce the anxiety that is associated with body shape.

c) **Safety Beliefs**: The belief that a feared consequence will occur if one does not engage in body checking.

d) **Body Control**: The belief that body checking helps one to moderate food intake and control body shape.

On face value, the Reassurance and Safety Belief domains allude to an obsessive-compulsive relationship between concerns over shape and weight, and body checking. However, research is yet to examine potential relationships between these variables. Only preliminary data has been obtained thus far, with Mountford and colleagues (2006) reporting that body checking cognitions are highly correlated with body checking behaviours in individuals who meet DSM-IV-TR criteria for AN, BN, and EDNOS. Reassurance, Safety Beliefs, and Body Control are most related to disordered eating behaviours whilst Objective Verification is equally common among eating
disorder patients and community controls (Mountford et al., 2006). This finding appears theoretically sound since body checking is commonly used to gain insight into one’s size and shape irrespective of the presence of an eating disorder.

Whilst not the primary focus of this research, the well-established relationship between eating disorder symptoms such as body checking and body dissatisfaction, and mood disorders such as depression should be noted (Fairburn et al., 2000; Wilson, 2005). Genetic factors are related to the development of both eating disorders and depression, and depression has been shown to be a consequence of eating pathology, even amongst previously non-depressed women (Wilson, 2005). Disordered eating behaviours and eating disorder attitudes also present as a perpetuating factor of mood disturbance, whilst body dissatisfaction increases when negative affect is induced (Wilson, 2005). These findings have been demonstrated amongst both clinical and community samples, with elevations in body checking and body image disturbance repeatedly associated with depressive symptoms among women in the community (Fairburn et al., 2000; Farrell, Shafran, & Lee, 2006). Therapeutic models of eating disorders and depression also share some similarity, with CBT being utilised to treat both conditions, particularly with respect to perfectionism (Wilson, 2005).

Other relationships have emerged between body checking cognitions and eating, shape, and weight related constructs. One link is between body checking cognitions and social physique anxiety, which refers to anxiety that arises in social settings in the context of eating, shape, and weight concerns. Hasse and colleagues (2007) administered a series of self-report questionnaires to a sample of 292 female university students in Great Britain. Objective Verification was associated with checking of the whole body and specific body parts on the BCQ, whilst Safety Beliefs and Body Control were associated with checking the whole body, checking specific body parts, and also engaging in idiosyncratic checking. Reassurance beliefs were associated with checking specific body parts in isolation. Social physique anxiety was also found to
partially mediate the relationship between body checking cognitions and body checking behaviours. The authors noted that these findings need to be replicated among a clinical sample if the nature of body checking cognitions is to be adequately addressed in clinical settings (Hasse et al., 2007). It would also be valuable to examine the relationships between body checking cognitions and clinical disorders where checking behaviours and behavioural rituals are evident, both of which are present in OCD.
Chapter 3
Eating Disorders and Obsessive-Compulsive Disorder

Obsessive-Compulsive Disorder (OCD)

In recent decades, symptoms of AN, BN, and EDNOS have been associated with OCD (Godart et al., 2006b; Rubenstein, Altemus, Pigott, Hess, & Murphy, 1995; Swinburne & Touyz, 2007; Thiel et al., 1995; Wonderlich et al., 2006). OCD is an anxiety disorder that is characterised by recurrent and persistent fears that result in marked distress and anxiety (American Psychiatric Association, 2000). Termed obsessions, these fears are experienced by the individual as intrusive and are ego-dystonic, that is, they are not consistent with the individual’s belief system and are not thoughts the individual would like to endure (DeVeauh-Geiss, 1993). Common obsessions include aggressive thoughts, thoughts containing sexual content, fears of contamination, pathological or repeated doubts, somatic obsessions, and a desire for symmetry (American Psychiatric Association, 2000; DeVeauh-Geiss, 1993).

Individuals with these beliefs have a desire to suppress intrusive thoughts in order to neutralise the associated distress (American Psychiatric Association, 2000). As such, they frequently develop compulsions, which are processes of neutralisation that involve replacing the intrusive thought with an alternate thought, or engaging in a specific behaviour or action to prevent the feared consequence of the thought (Foa, Kozak, Salkovskis, Coles, & Amir, 1998). Compulsions are performed repeatedly in a ritualistic way, are not associated with pleasure, and reduce distress and anxiety associated with obsessive thoughts (American Psychiatric Association, 2000). To illustrate this concept, an individual who maintains an obsessive fear of contamination may wash their hands multiple times each day for extended periods of time. Other common compulsions include checking, counting, praying, ordering of objects, and other forms of washing and cleaning (Foa et al., 2002). In some cases, these behaviours are not directly related to the circumstances that they are designed to prevent (DeVeauh-Geiss,
Over an extended period, compulsions become increasingly time consuming as they develop into idiosyncratic rules that link a complex set of behaviours and/or mental acts. Patients with OCD generally acknowledge that their fears are excessive or unreasonable, and can recognise that the intrusive thoughts originate from within their own mind, and are not inserted or imposed on the individual from external sources (c.f. psychosis; American Psychiatric Association, 2000). Refer to Appendix D for a summary of the DSM-IV-TR diagnostic criteria for OCD.

The lifetime prevalence of OCD has been approximated at 2.5% of the adult population (American Psychiatric Association, 2000; Gibbs, 1996; Weissman et al., 1994). Unlike eating disorders, the prevalence of OCD is similar across cultures, with symptoms of this disorder typically emerging during childhood or adolescence (Gibbs, 1996). During adolescence, OCD is twice as common amongst girls as boys, however equal prevalence rates among males and females have been reported in adults (American Psychiatric Association, 2000). Seventy-five per cent of individuals with OCD will experience at least one major depressive episode in their lifetime, whilst 33% meet criteria for comorbid depressive disorder at the time they are diagnosed with OCD (Abramowitz, Whiteside, Lynam, & Kalsy, 2003; American Psychiatric Association, 2000).

The symptoms of OCD have been linked to disordered eating since each eating disorder category is associated with an intense fear (e.g., gaining weight) that is accompanied by behaviours that imitate compulsions (e.g., repeated body checking that alternates with periods of avoidance). This notion has been articulated in the DSM-IV-TR, which recognises that preoccupations resembling OCD often emerge in the realms of eating disorder symptoms. In order to meet the criteria for OCD however, preoccupations cannot be limited to food, shape, and weight, as this would more likely constitute the diagnosis of an eating disorder. Nonetheless, the DSM-IV-TR also stipulates that “when individuals with AN exhibit obsessions and compulsions that are
not related to food, body shape, or weight, an additional diagnosis of OCD may be warranted" (American Psychiatric Association, 2000, p. 541).

**Statistical Comorbidity between Eating Disorders and OCD**

Statistical comorbidity studies have revealed that between 2% and 48% of individuals with eating disorders also demonstrate clinical symptoms of OCD (Ben-Tovim, Marilov, & Crisp, 1979; Braun, Sunday, & Halmi, 1994; Halmi et al., 1991; Herzog, Keller, Sacks, Yeh, & Lavori, 1992; Thiel et al., 1995; Thornton & Russell, 1997). Preliminary studies have reported the lifetime prevalence of OCD in individuals with AN to be between 20% and 28.6% (Halmi et al., 1991; Milos, Spindler, Ruggiero, Klaghofer, & Schnyder, 2002), between 0% and 42.9% for those with BN (Brewerton et al., 1995; Fornari et al., 1992; Godart et al., 2000; Halmi et al., 1991; Hudson, Pope Jr., Yurgelun-Todd, Jonas, & Frankenbarg, 1987; Kaye, Bulik, Thornton, Barbarich, & Masters, 2004; Laessle, Wittchen, Ficter, & Pirke, 1989; Lilenfield et al., 1998; Milos et al., 2002; Powers, Coovert, Brightwell, & Stevens, 1988; Schwalberg, Barlow, Alger, & Howard, 1992; Skodol et al., 1993; Thornton & Russell, 1997), and 20.8% for EDNOS patients (Halmi et al., 1991). Lifetime prevalence of OCD among patients with a history of both AN and BN has been reported between 10 and 66% (Fornari et al., 1992; Godart et al., 2006b; Kaye et al., 2004; Laessle et al., 1989), whilst the comorbidity of eating disorders with Obsessive-Compulsive Personality Disorder (OCPD) lies between 2.6% and 60% (Halmi et al., 2005b; Piran, Lerner, Garfinkel, Kennedy, & Brouillette, 1988; Thornton & Russell, 1997; Wonderlich, Swift, Slotnick, & Goodman, 1990).

More recent studies have examined comorbidity rates among subtypes of AN and BN, with the general consensus being that obsessive-compulsive symptoms are more prominent among AN patients, particularly the AN-Restricting subtype (Godart et al., 2006b; Swinburne & Touyz, 2007). Although the lifetime prevalence of OCD has been shown to lie between 9.5% and 62% for individuals with AN-Restricting (Fornari et al., 1992; Godart et al., 2000; Godart et al., 2006b; Kaye et al., 2004; Laessle et al.,
1989; Lilenfield et al., 1998), this cluster of studies failed to compute comorbidity estimates across all subtypes, nor did they control for key demographic and individual difference variables.

The most comprehensive statistical comorbidity study comparing eating disorders with OCD was published by Godart and colleagues (2003). This study recruited 271 women engaged in treatment for an eating disorder (166 with AN and 105 with BN), and 271 controls who were matched with the treatment groups on sex, age, and socio-professional status. The lifetime prevalence of OCD was 24.3% for patients with AN-Restricting, 23.6% for those with AN-Binge Eating/Purging, 9.4% for those with BN-Purging, and 16.7% for those with BN-Non-Purging. Current prevalence rates of OCD were 17.1% for the AN-Restricting group, 21.8% for AN-Binge Eating/Purging, 5.9% for BN-Purging, and 16.7% for the BN-Non-Purging cluster (Godart et al., 2003).

The comorbidity between eating disorders and OCD has also been examined among an Australian sample by Thornton and Russell (1997), who recruited 68 inpatients (35 with AN and 33 with BN) at a specialist dieting clinic affiliated with the University of Sydney. Using the Composite International Diagnostic Interview, it was found that 37% and 3% of the AN and BN subjects respectively met criteria for OCD. In terms of chronology of appearance, OCD predated the diagnosis of an eating disorder by an average of 5.4 years. More surprising, however, was that no eating disorder cases were diagnosed prior to OCD, whilst two cases were diagnosed in the same year (Thornton & Russell, 1997). Comparable findings regarding chronology of onset have been documented among international studies (Kaye et al., 2004). Kaye and colleagues (2004) investigated 282 BN (98.6% female), 97 AN (96.9% female), and 293 AN/BN (99% female) patients from the Price Foundation Collaborative genetics study. Forty-two per cent of the eating disorder patients were diagnosed with one or more anxiety disorders during childhood, whilst 23% had childhood onset OCD, when
compared with the 2% to 3% reported in the general population (Kaye et al., 2004). O’Brien and Vincent (2002) have argued that this temporal relationship indicates that women with eating disorders maintain a premorbid tendency to be obsessive. It has also been postulated that starvation effects, or the effects of malnutrition, amplify any premorbid obsessionality during the acute phase of an eating disorder (Godart et al., 2003; O’Brien & Vincent, 2002).

In addition to predating the emergence of pathological eating, obsessive-compulsive symptoms also persist following recovery or remission from an eating disorder (Swinburne & Touyz, 2007; von Ranson, Kaye, Weltzin, Rao, & Matsunaga, 1999; Wagner et al., 2006). An early study by Hudson and colleagues (1987) reported the prevalence of OCD among BN patients \( (n = 51) \) in the acute phase of their condition as 33%, whilst the prevalence among BN-Remitted patients \( (n = 19) \), defined as having no eating binges for at least six months, was 32%. Similar findings have also been obtained by Morgan, Wolfe, Metzger, and Jimerson (2007) who reported that there were no significant differences in scores on the Maudsley Obsessive-Compulsive Inventory (MOCI; Hodgson & Rachman, 1977) when comparing individuals with BN with those in remission from BN. However, scores on the MOCI were significantly higher in the BN and BN-Remitted groups when compared with controls (Morgan et al., 2007).

These findings are consistent with those of Wagner and colleagues (2006), who recruited a sample of females who met diagnostic criteria for BN \( (n = 19) \) or had recovered from AN \( (n = 29) \), BN \( (n = 19) \), or both disorders \( (n = 12) \). These authors found that the prevalence of OCD was 63.2% in those women who had recovered from an eating disorder and 36.4% in those women who still met diagnostic criteria for BN. Similar to the findings of Morgan and colleagues (2007), all recovered eating disorder groups demonstrated significantly higher scores on an OCD measure, in this case the Yale-Brown Obsessive-Compulsive Scale (YBOCS; Goodman et al., 1989), when
compared with community controls (Wagner et al., 2006). These finds suggest that following recovery from BN, obsessional beliefs and compulsive remain significantly higher than those observed in individuals without an eating disorder. In effect, the nature (and at times severity) of the symptoms is consistent during both the acute phase and following recovery from the condition.

An OCD diagnosis has implications on the severity and course of the acute phase of an eating disorder (Halmi et al., 1991; Kasvikis, Tsakiris, Marks, Basoglu, & Noshirvani, 1986; Thiel et al., 1995). Milos and colleagues (2002) reported that comorbid OCD was associated with greater eating disorder duration in patients with either AN or BN. Specifically, women with eating disorders were 4.2 times more likely to have a duration exceeding seven years if they had a comorbid diagnosis of OCD (Milos et al., 2002). In association, Thiel and colleagues (1995) contend that comorbid OCD is associated with more severe eating pathology and “a significantly higher degree of disturbed attitudes and behaviour” (p. 74) when compared with eating disorder patients without OCD. It should be noted that in a follow-up study, Thiel and colleagues (1998) found that an OCD diagnosis had minimal influence on the course of an eating disorder over a 2.5 year period, with only minor differences emerging for concomitant and non-concomitant OCD.

The course of OCD has also been shown to be influenced by the presence of disordered eating behaviours (Joffe & Swinson, 1987; Pigott et al., 1991). Between 6% and 12% of individuals with OCD also meet DSM-IV-TR criteria for an eating disorder (Fahy, Osacar, & Marks, 1993; Kasvikis et al., 1986; Rubenstein, Pigott, L’Heureux, Hill, & Murphy, 1992), with the vast majority of cases being female despite an absence of sex differences in the adult prevalence of OCD. Comorbid eating disorder cases have been associated with earlier onset OCD and the presence of eating disorder attitudes at a younger age (Kasvikis et al., 1986). Furthermore, weight restoration in AN patients has been associated with a decline in symptoms of OCD on the MOCI
(Channon & DeSilva, 1985). These findings extend to general attitudes about eating and concerns over shape and weight, with studies revealing that individuals with OCD demonstrate significantly higher scores on the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979; Joffe & Swinson, 1987) and the Eating Disorders Inventory (EDI; Garner, Olmstead, & Polivy, 1983; Pigott et al., 1991) when compared with community controls.

In summary, comorbidity that is well above chance has been documented between eating disorders and OCD, with individuals with AN demonstrating a higher OCD prevalence when compared with those with BN. OCD symptoms appear to predate the emergence of an eating disorder, intensify during the acute phase of an eating disorder, and persist following treatment of eating pathology. The prevalence of eating disorders is also elevated among individuals with OCD (particularly among women), with heightened concerns over shape and weight being evident among this clinical population when compared with non-clinical controls.

**Phenomenological Similarities Between Eating Disorders and OCD**

Phenomenological similarity between eating disorders and OCD has been documented in both clinical observation and empirical research since the dawn of the study of eating disorders (Rubenstein et al., 1995; Wu, 2008). Preliminary work by Du Bois (1949) viewed AN as a “compulsion neurosis with cachexia” (p. 107), which indicated a disorder characterised by uncontrollably rigid and stereotyped rituals accompanied by substantial weight loss, muscle atrophy, and fatigue. Several researchers also maintain that eating disorders represent a culturally-specific form of OCD that manifests with obsessions surrounding food and thinness (Rothenberg, 1986; Thiel et al., 1995). In this regard, the pathogenesis of eating disorders is encouraged by the societal emphasis on thinness, with attainment of ideal body weight being associated with a more attractive appearance, and consequently, greater
approval and acceptance (Rieger, Touyz, Swain, & Beumont, 2001; Rothernberg, 1986).

Based on the obsessions and compulsions that are regularly exhibited by individuals with an eating disorder, Rothenberg (1986) has argued that eating disorders are a contemporary expression of OCD and can be considered a “modern obsessive-compulsive syndrome” (p. 45), drawing on similarities in the obsessional focus on particular stimuli (e.g., food, shape, and weight), a need for control (e.g., over dietary intake, exercise), and associated fears that are irrational and overestimate the likelihood of a feared consequence. If eating disorders were to represent a form of OCD, a fundamental question lies in the nature of the obsessions and compulsions evident in these conditions. Simply put, it has been argued that preoccupations with shape and weight are a form of obsession whilst binge eating and purging behaviours demonstrate compulsions (von Ranson et al., 1999). Such a conceptualisation of the function of eating disorders is parsimonious, yet may oversimplify the nature of symptoms associated with these disorders.

Theorists contend that rumination about food; thinking about one’s body shape and weight; and mental images about food constitute obsessive thoughts, whilst the overwhelming fear of weight gain is consistent with the obsessive fear of harm to self maintained by a proportion of patients with OCD (Du Bois, 1949; Nilsson, Gillberg, Gillberg, & Rastam, 1999; O’Brien & Vincent, 2002; Rothernberg, 1986). Individuals with an eating disorder often have the belief that eating even a small portion of food will have a disproportional impact on body shape. The resultant development of rigid and uncompromising rules surrounding food and eating may function as a neutralising or anxiety-reducing behaviour and in this context, may be operationalised as compulsions. Such behaviours include calorie counting, excessive monitoring of dietary intake, eating at certain times of the day or with particular utensils, and engaging in exorbitant amounts of exercise.
Empirical evidence for this contention has been provided by Thiel and colleagues (1995), who examined 93 female inpatients who had been diagnosed with AN \((n = 12)\), BN \((n = 60)\), or both conditions \((n = 21)\). Results indicated that individuals with AN experienced elevated obsessions surrounding diet, weight, and body image, whilst individuals with BN had an irresistible compulsion to purge following a binge eating episode. Women with AN or BN also maintained general obsessions about self-injury or injury to others, pathological doubt, contamination, religion and morality, a need for symmetry, and sexual content, whilst general compulsions comprising cleaning, checking, ordering, and counting were also common (Thiel et al., 1995). This finding is consistent with other studies that have reported that obsessions of symmetry and exactness are the most prevalent domain of obsessionality among AN patients (Halmi et al., 2003) and BN patients (von Ranson et al., 1999), with conclusions by von Ranson and associates suggesting that “obsessionality may be a trait-like attribute in BN” (p. 1707). In a community sample of college students, Humphreys, Clopton, and Reich (2007) reported that scores on the EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982) were most highly correlated with washing and ordering compulsions on the Obsessive-Compulsive Inventory – Revised (OCI-R), with the EAT-26 having the weakest association with hoarding. In effect, eating disorder patients may have a general tendency towards obsessionality, with obsessions manifesting in the domain of eating, shape, and weight having implications on the development and maintenance of an eating disorder.

Despite phenomenological similarities indicating that eating disorders represent a variant of OCD, marked differences have also emerged (Engel et al., 2005; Halmi, 1999). Halmi (1999) has postulated that if obsessive-compulsive symptoms do not change following recovery from BN, it is likely that OCD does not contribute to the pathogenesis of BN. Individuals with OCD seldom score high on measures of impulsivity due to an overwhelming need for stability and consistency, however, both
high compulsivity and impulsivity can be evident among individuals with eating disorders (Engel et al., 2005). Research by Engel and colleagues (2005) has shown that elevated scores on both traits can occur concurrently among BN patients, with high impulsivity and compulsivity associated with the greatest comorbid psychopathology among BN patients.

Others have also argued that unlike the obsessions of OCD, the preoccupations with shape and weight that are evident in individuals with AN or BN are ego-syntonic, that is, they are consistent with the individual’s belief system (Shafran et al., 2004). These obsessive thoughts are also not resisted by the individual and are not generally perceived as intrusive (Shafran, 2002; Shafran et al., 2004). Although individuals with OCD often acknowledge that their beliefs are not reality based but are maintained anyway, this is not necessarily the case for individuals with eating disorders as it is often believed that goals with respect to ideal weight attainment are both reality based and necessary. In effect, although there are distinct topographical similarities between the features of eating disorders and OCD, the presenting symptoms are functionally different (Halmi, 1999).

Rothernberg (1986) has suggested that whilst the beliefs and attitudes of eating disorders appear ego-syntonic, subsequent behaviours are excessive. This may be equated to individuals with OCD who wash their hands for several hours each day due to a fear of germs being present on their hands. Whilst the behaviour serves to attain a goal of cleanliness, the behaviour far exceeds the amount of washing required. With respect to eating disorders, the desire to attain an ideal body shape might result in body checking behaviours that manifest around reassurance or a form of basic evidence seeking. As the disorder progresses however, the frequency and duration of body checking can increase exponentially. Over time, the motivation to engage in this behaviour becomes unclear. Whilst repeated body checking is associated with heightened distress rather than relief (Shafran et al., 2007), engagement in body
checking may be related to neutralisation of worry, or neutralisation of intrusive thoughts surrounding body shape and weight. Individuals with OCD often state that there is a need to engage in repeated compulsions in order to obtain a sensation of feeling *just right*. The development of complex compulsions makes this process increasingly difficult, resulting in near constant engagement in some form of ritual. Whether engagement in body checking behaviours in eating disorders is associated with a desire to feel *just right* warrants further research.

**Introduction to Obsessive-Compulsive Cognitions**

Unwanted and intrusive thoughts are a normal and universal occurrence, and can escalate into an obsession when they are negatively appraised and interpreted as a potential threat (Salkovskis, 1996). Cognitive appraisal is the process of interpreting the nature of a thought by providing meaning and judging its perceived consequences (OCCWG, 1997). Appraisals can be positive or negative, enable an individual to measure the perceived importance of the thought, and with regard to thoughts about an event, may incorporate an assessment of the probability or likelihood of the event occurring and an analysis of the responsibility to prevent the event from occurring (Lazarus & Folkman, 1984; OCCWG, 1997). An assumption maintained by many OCD sufferers is that they are responsible for controlling events that are perceived as having catastrophic consequences. Whilst similar assumptions extend to other anxiety or even mood disorders, assumptions that are specific to OCD include the erroneous and perpetually maladaptive belief that by modifying, suppressing, or preventing the thought, the likelihood of the event is also reduced or eliminated (Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006; Abramowitz, Nelson, Rygwall, & Khandker, 2007; OCCWG, 2005).

Recent studies by the OCCWG (1997, 2003, 2001, 2005) have sought to identify the cognitive styles and common thinking errors that are most salient to the development of obsessive beliefs and the perseverance of OCD. The foremost beliefs
considered pertinent to OCD were incorporated into the Obsessive Beliefs Questionnaire (OBQ-87), a theoretically derived measure of obsessive beliefs (OCCWG, 2001). This measure examined six constructs associated with negative appraisals, misguided assumptions, elevated scores of obsessiveness, and the misinterpretation of intrusive thoughts (OCCWG, 2001, 2003). The six constructs were categorised into the following obsessive belief domains:

a) *Importance of Thoughts*: The belief that thoughts are very meaningful and that the mere occurrence of a thought has consequences that are potentially dangerous.

b) *Control of Thoughts*: The belief that it is both possible and necessary to control thoughts.

c) *Overestimation of Threat*: An exaggerated belief regarding the risk of harm, negative consequences, and the likelihood of a catastrophe.

d) *Inflated Responsibility*: The belief that one is responsible for preventing negative events or negative consequences that are associated with intrusive thoughts.

e) *Perfectionism*: The belief that it is both possible and necessary to be perfect, and that imperfections are unbearable.

f) *Intolerance of Uncertainty*: The belief that any ambiguity or uncertainty surrounding intrusive thoughts or the likelihood of a catastrophe is intolerable.

Despite encouraging psychometric properties with regards to internal consistency and construct validity (both convergent and discriminant), subscales within the OBQ-87 were found to be highly intercorrelated (OCCWG, 2003). Based on the lack of discrimination between subscales, the OBQ-44 was developed, a shorter 44-item measure containing three empirically derived constructs based on factor analytic techniques. High intercorrelations were accounted for in the revised measure by condensing the six original constructs into three subscales. These included: a)
Perfectionism/Intolerance of Uncertainty, b) Importance/Control of Thoughts, and c) Overestimation of Threat/Inflated Responsibility (OCCWG, 2005). Subsequent factor analytic analyses by independent reviewers have provided preliminary evidence that the revised structure of this measure closely represents the core obsessive beliefs of OCD (Myers, Fisher, & Wells, 2008; Woods, Tolin, & Abramowitz, 2004). Woods and colleagues (2004) administered the OBQ-44 to 1004 undergraduate psychology students and identified four OBQ factors. These included Importance/Control of Thoughts, Perfectionism, and Responsibility. A general factor also emerged consisting predominantly of Overestimation of Threat items in addition to general items from the five remaining obsessive beliefs (Woods et al., 2004). Comparable findings were revealed in Myers and colleagues' (2008) study of 238 students studying in England. Whilst Overestimation of Threat and Inflated Responsibility again loaded on separate factors, the Importance and Control of Thoughts domains, and the Perfectionism and Intolerance of Uncertainty subscales maintained the factor structure initially proposed by the OCCWG (Myers et al., 2008).

The cognitive domains identified by the OCCWG have been utilised in research examining various diagnostic categories. These include OCD, mood disorders, other anxiety disorders, eating disorders, and personality disorders (Lavender, Shubert, de Silva, & Treasure, 2006; OCCWG, 2005; Tolin, Worhunsky, & Maltby, 2006). These studies have found that certain obsessive belief domains are more exclusively associated with OCD (e.g., inflated responsibility) than others (e.g., overestimation of threat, perfectionism) (OCCWG, 1997). Several obsessive beliefs also correlate strongly with worry themes that are associated with GAD (Coles, Mennin, & Heimberg, 2001), which has lead theorists to question the utility of measuring obsessional beliefs if it is difficult to discriminate scores on these variables across diagnostic groups (Tolin et al., 2006). Dugas and colleagues (1998) reported that a distinct feature among the worry associated with GAD and OCD-type worries is the immediacy of the threat.
Individuals with GAD are more likely to focus on future threats, whilst worry themes among OCD sufferers focus on urgent threats with more immediate consequences (Coles et al., 2001). Phenomenological differences are also evident. For example, although obsessional beliefs and worry are both repetitive and persistent thoughts associated with a feared negative consequence, obsessional thoughts are not merely worries about everyday life-problems, but rather a process of identifying threat and eliminating that threat through thought suppression and repetitive rituals that can be both cognitive and behavioural.

The OCCWG (2005) reported that individuals with OCD score significantly higher on the OBQ-44 total score and all OBQ-44 subscales when compared with community and student controls. Individuals with OCD also scored significantly higher than anxious controls (meeting criteria for at least one of Panic Disorder, Agoraphobia, Post Traumatic Stress Disorder, Generalised Anxiety Disorder, Specific Phobia, Social Phobia, Hypochondriasis) on the OBQ-44 total score, and the Importance/Control of Thoughts and Overestimation of Threat/Inflated Responsibility subscales. Only minor differences were found in scores on the Perfectionism/Intolerance of Uncertainty subscale (OCCWG, 2005), which further validates that certain obsessional beliefs are salient across a variety of anxiety disorders, and raises questions about the other disorders where such beliefs are also present.

Further evidence for this finding was provided in a comprehensive study of obsessive beliefs by Tolin and colleagues (2006). This team of researchers investigated the specificity of obsessive beliefs with regards to their association with OCD. Specificity refers to whether obsessive beliefs are endorsed by individuals with OCD to a higher degree than that of individuals with other disorders. One-hundred sixty-one outpatients seeking treatment at an anxiety clinic were recruited to participate, with 89 presenting with OCD and 72 meeting DSM-IV-TR criteria for another anxiety disorder (e.g., GAD, Panic Disorder with Agoraphobia). Participants
with OCD or another anxiety disorder scored significantly higher than community controls on all OBQ-87 subscales, whilst participants with OCD scored significantly higher than anxious controls on all OBQ-87 subscales aside from responsibility. When controlling for depression, the OCD group maintained significant differences on all subscales of the OBQ-87 when compared with controls, however participants with OCD differed from anxious controls on only the Control of Thoughts subscale. More surprising was the finding that when controlling for trait anxiety, participants with OCD differed from anxious controls and community controls on only the Control of Thoughts subscale. On the OBQ-44, participants with OCD were found to differ from community controls on all three subscales, and also scored significantly higher than anxious controls on the Importance/Control of Thoughts and Perfectionism/Certainty subscales. After controlling for depression, no significant differences emerged between the OCD and anxious control groups, or the anxious control and community control groups. Furthermore, after controlling for trait anxiety, there were no significant differences between the OCD, anxious control, or community control groups on any of the OBQ-44 subscales. It was concluded that differences in the perceived importance of thoughts and the need to control thoughts were the most distinguishable obsessive belief domains when comparing OCD with other anxiety disorders. These findings also heightened awareness of the potential association between depressive symptoms, trait anxiety, and obsessive beliefs, with depressive symptoms and trait-related anxiety being found to mediate the relationship between obsessive beliefs and OCD symptomatology (Tolin et al., 2006).

In light of these findings, theorists advocate that the next phase of this research is to examine these cognitions among other related pathologies such as eating disorders (Humphreys et al., 2007; Lavender et al., 2006; Shafran, 2002). Lavender and colleagues (2006) were the first to examine the six domains of the OBQ-87 among an eating disorder population. These authors examined obsessive beliefs and thought
appraisals in the context of magical ideation, which is a set of “beliefs that defy culturally accepted laws of causality” (p. 333). Participants were recruited from a register of patients who were part of the Eating Disorders Research Unit in London. Participants were either in treatment at the time of the study or had a prior history of an eating disorder. One-hundred seventy-seven participants were recruited, incorporating 52 with AN, 42 with BN, six with Binge Eating Disorder (BED), and 26 with EDNOS. An OCD comparison group and anxious control group were made possible by utilising data collected by the OCCWG (2003) in the psychometric assessment of the OBQ-87. Results indicated that there were no significant differences on the OBQ-87 subscales across the eating disorder diagnostic categories, however considerable differences emerged across the clinical groups. Specifically, current eating disorder patients scored significantly higher than participants who had recovered from an eating disorder on all subscales aside from Inflated Responsibility. Participants with a current eating disorder also had significantly higher scores on the Perfectionism, Intolerance of Uncertainty, Overestimation of Threat, and Importance of Thoughts subscales of the OBQ-87 when compared with the OCD comparison group. The authors highlighted that despite the presence of these obsessive beliefs among participants with a current eating disorder, aside from perfectionism, these cognitive constructs are not currently incorporated within cognitive models of eating disorders. In addition, the finding that participants who had recovered from an eating disorder still had elevated scores on these measures relative to the comparison groups may indicate a vulnerability or maintaining role of obsessive beliefs with respect to eating disorders (Lavender et al., 2006).

In a more recent investigation, Humphreys and associates (2007) examined the relationship between obsessive beliefs on the OBQ-87 and concerns over eating and body shape on the EAT-26. A sample of 160 college students aged between 17 and 49 years was recruited, and results revealed a weak correlation between total scores on the EAT-26 and OBQ-87 ($r = .26$). Hierarchical regression analyses indicated that the
Perfectionism and Inflated Responsibility subscales on the OBQ-87 accounted for 5% and 2% of the variance in EAT-26 total scores respectively, with higher scores on Inflated Responsibility being related to lower scores on the EAT-26 (Humphreys et al., 2007).

Whilst these two studies represent the limited research directly examining the incidence of obsessive-compulsive cognitions among an eating disorder population, several relationships have been identified and theorists have speculated about other plausible links and directions for further study (Humphreys et al., 2007; Lavender et al., 2006). The next phase of this review will discuss each obsessive belief domain in turn. Despite gaps in the research, associations between each construct and eating disorder phenomenology and symptomatology will be discussed where possible.

**Obsessive-Compulsive Cognitions and Eating Disorders**

**Perfectionism, OCD, and eating disorders.** Perfectionism is a personality trait or cognitive disposition that has gained considerable attention within the literature on eating disorders, OCD, and other forms of psychopathology such as OCPD (Bulik et al., 2003; Davis, Claridge, & Fox, 2000; Forbush et al., 2007; Franco-Paredes, Mancilla-Diaz, Vazquez-Arevalo, Lopez-Aquilar, & Alvarez-Rayon, 2005; Halmi et al., 2000; Wade, 2007). English and English (1958) defined perfectionism as the “practice of demanding of oneself or others a higher quality of performance than is required by the situation” (as cited in Bastiani, Rao, Weltzin, & Kaye, 1995, p. 147). According to the OCCWG (1997), individuals high on perfectionism have a “tendency to believe there is a perfect solution to every problem, that doing something perfectly is not only possible, but also necessary, and that even minor mistakes will have serious consequences” (p. 678). More recently, Shafran and colleagues (2002) presented a cognitive-behavioural model of this construct, defining perfectionism as “the overdependence of self-evaluation on the determined pursuit of personally demanding, self-imposed standards in at least one highly salient domain, despite adverse
consequences” (p. 778). Individuals high on perfectionism regularly disregard accomplishments and focus almost exclusively on failures (Franco-Paredes et al., 2005). In addition, superior performance is perceived as being directly linked to greater effort (Bauer & Anderson, 1989).

Whilst perfectionistic tendencies in isolation do not predispose an individual to develop an eating disorder, elevated perfectionism in combination with a hypercritical nature, anxiety, and a preoccupation with body shape and weight are likely to present a multitude of problems and have been shown to pose a direct risk for eating pathology (Paredes et al., 2005; Shafran et al., 2002). This places Western societies at heightened risk since preoccupations with attaining an ideal body shape are culturally accepted, and in many cultures encouraged, with the end goal being physical flawlessness (Brownell, 1991). In many Western cultures, individuals with AN or BN exhibit significantly higher scores on perfectionism when compared with controls (Bulik et al., 2003; Forbush et al., 2007). Those with AN demonstrate the highest scores of perfectionism (Forbush et al., 2007; Franco-Paredes et al., 2005; Halmi et al., 2000), which is related to inflexibility and dietary restraint (Bastiani et al., 1995). Perfectionism tends to persist following long-term recovery from an eating disorder, and scores of perfectionism are often elevated in relatives of eating disorder patients (Forbush et al., 2007; Halmi et al., 2000).

Lifespan changes in perfectionism have been investigated by examining scores on perfectionism at different developmental stages and the lifetime incidence of disordered eating behaviours (Bastiani et al., 1995; Forbush et al., 2007). Forbush and colleagues (2007) conducted a 20-year longitudinal study that examined eating patterns among a sample of 750 male and 1732 female undergraduate university students. These authors administered the perfectionism scale of the EDI, and also enquired about lifetime occurrence of eating disorder behaviours such as fasting, binge eating, self-induced vomiting, and diuretic and laxative use. It was found that high
perfectionism in women was related to elevated lifetime prevalence of each of these behaviours. Whilst lifetime presence of disordered eating behaviour was associated with perfectionism in a general sense, fasting and purging yielded the greatest effect sizes among females. Binge eating was also associated with perfectionism, although this relationship was explained in terms of the mutual association binge eating and perfectionism share with fasting. This study illustrates why perfectionism is associated with both AN and BN since fasting is common in both disorders (Forbush et al., 2007).

In the context of OCD, Ferrari (1995) compared scores on the Perfectionistic Cognitions Inventory with the Compulsive Activity Checklist in a community sample. Significantly higher correlations were found between perfectionism and compulsive checking behaviours when compared with non-checking rituals such as hand washing. Norman, Davies, Nicholson, Cortese, and Malla (1998) replicated these findings in a clinical sample by correlating scores of perfectionism with those on the MOCI and the Padua Inventory. Results indicated that correlations between perfectionism and checking, ordering, and ruminating were considerably higher than those between perfectionism and cleaning or washing compulsions (Norman et al., 1998).

The measurement of perfectionism has varied considerably, with recent research measuring this construct using multidimensional scales (Bulik et al., 2003; Franco-Paredes et al., 2005; Shafran et al., 2002). Although a range of measures are available, two scales, both called the Multidimensional Perfectionism Scale (developed by independent research teams), have been at the forefront of measuring perfectionism over the past two decades (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1989). The MPS-F, developed by Frost and colleagues (1990), examines six core domains of perfectionism. Self-oriented perfectionism is measured by the Organisation, Concern Over Mistakes, Personal Standards, and Doubts About Actions subscales, whilst the Parental Criticisms and Parental Expectations subscales examine socially oriented perfectionism with regards to parents (Frost et al., 1990). Research
incorporating the MPS-F has found that when compared with controls, individuals with AN or BN have significantly higher scores across all perfectionism subscales aside from Organisation (Halmi et al., 2000). However, Concerns Over Mistakes and Doubts About Actions are the domains most highly associated with AN and BN when compared with the other perfectionism subscales (Bulik et al., 2003). High scores on the MPS-F are associated with more severe eating preoccupations and rituals, and a low motivation to change (Bastiani et al., 1995; Halmi et al., 2000). Some aspects of perfectionism have been found to vary across eating disorder subtypes, with scores on the Parental Concerns subscale of the MPS-F being significantly higher for the AN-Binge Eating/Purging subtype when compared with the AN-Restricting subtype (Halmi et al., 2000). The MPS-F has also been associated with obsessive-compulsive symptomatology, with Frost and colleagues demonstrating that Doubts About Actions and Concerns Over Mistakes are highly correlated with scores on the MOCI.

The alternate multidimensional perfectionism measure, the MPS-H, was developed by Hewitt and Flett (1989). The MPS-H examines perfectionism across self-oriented, socially prescribed, and other-oriented perfectionism domains, with the latter examining expectations the respondent places on other people being perfectionistic (Hewitt & Flett, 1989). Hewitt, Flett, and Ediger (1995) administered the MSP-H to 81 university students. It was reported that whilst self-oriented perfectionism was related only to anorexic symptoms, socially prescribed perfectionism was associated with broad eating disorder attitudes as well as self-esteem (Hewitt et al., 1995). This measure has also been utilised among eating disorder populations, with McLaren, Gauvin, and White (2001) reporting that self-oriented and socially prescribed perfectionism each account for approximately 5% of the variability in dietary restraint. Further support for this finding has been provided by Davis (1997), who administered the MPS-H to 123 patients with either AN or BN. It was found that self-oriented perfectionism was associated with high body esteem, however the inverse of this
relationship emerged when the patient also reported elevated scores of socially-prescribed perfectionism (Davis, 1997).

Bastiani and colleagues (1995) administered both the MPS-F and MPS-H to 10 healthy female controls, and 19 female patients with AN, 11 of whom were underweight and eight who had returned to a normal body weight within the four weeks preceding the study. It was found that underweight AN patients scored significantly higher than controls across all MPS-F subscales aside from Parental Expectations. Surprisingly, AN patients in the weight restored group continued to exhibit significantly higher perfectionism scores across the Organisation, Concern Over Mistakes, and Parental Criticisms subscale when compared with controls. No significant differences were found between the underweight and weight restored AN groups across the MPS-F subscales and total score. On the MPS-H, underweight and weight restored AN patients scored similarly across all subscales. Whilst weight restored AN patients scored significantly higher than controls only on self-oriented perfectionism, underweight anorexics scored significantly higher across both self-oriented and socially prescribed perfectionism when compared with controls (Bastiani et al., 1995).

Shafran (2002) has speculated that elevated scores of perfectionism may increase an individual’s vulnerability to a range of psychopathological disorders depending on the manner in which the perfectionistic tendencies are expressed. Based on this contention, if an individual demonstrates a need for order and cleanliness, the development of OCD is plausible. However, if the individual is perfectionistic in the domains of shape, weight, and cleanliness, it is possible that he or she may be at risk for the development of an eating disorder with comorbid OCD. In effect, the domain underlying the expression of the perfectionistic tendency may yield vital information regarding the nature of any future psychopathology. Based on these findings, Shafran and associates (2002) contend that eating disorders may represent an expression of clinical perfectionism that is exclusive to the domain of eating, shape, and weight.
Intolerance of uncertainty and eating disorders. Much of the OCCWG’s research on intolerance of uncertainty has focused on its association with perfectionism (Myers et al., 2008; OCCWG, 2005). Relationships have also been reported between intolerance of uncertainty and worry, with research focusing predominantly on cognitions experienced by individuals with OCD and GAD (Dugas, Schwartz, & Francis, 2004; Myers et al., 2008). Until recently, intolerance of uncertainty had not been studied in the context of eating disorders. It is well accepted however that individuals with AN, BN, or EDNOS often have difficulty formulating decisions and have rigid rules surrounding food and exercise to accommodate feelings of certainty regarding food intake and minimising increases in weight. Monitoring of calorie content and not consuming food where calorie content is unknown also represents attitudes and beliefs that are conducive to certainty (Shafran, 2002; Thiel et al., 1995; von Ranson et al., 1999). In eating disorders, intolerance is associated with an underlying fear, typically consisting of weight gain, changes in body shape, or disruption in weight loss momentum. Symptoms of this nature are closely linked to the intolerance of uncertainty that is evident in individuals presenting with OCD, however researchers argue that it is the content underlying the intolerance that appears to differ across disorders (Shafran, 2002). In OCD, indecisiveness is concerned with the content of intrusive thoughts and resultant compulsions, whilst in eating disorders, the inability to tolerate uncertainty is associated with stimuli that have the potential to change body shape or weight.

Preliminary examination of information processing paradigms indicates that intolerance of uncertainty is linked to biased concentration of threatening stimuli and a tendency to interpret ambiguous stimuli as threatening (Dugas et al., 2005). Dugas and colleagues (2005) allocated participants to groups based on high and low scores of intolerance of uncertainty. Participants were then presented with a series of word stimuli that were neutral (e.g., career, identifiable) or associated with uncertainty (e.g.,
chance, inconclusive). Results indicated that individuals in the high intolerance of uncertainty group were more likely to recall the uncertainty-oriented stimuli as opposed to the neutral stimuli. In addition, when confronted with ambiguous stimuli, high intolerance of uncertainty was associated with an interpretation of the stimulus as threatening (Dugas et al., 2005). It was concluded that characteristics of intolerance of uncertainty may present a predisposition to worry, particularly in the presence of uncertainty or doubt, or in the absence of exactness and perfection. It would be valuable to examine associations of this nature in relation to body checking behaviours and certainty beliefs. Whilst intolerance of uncertainty has been evaluated in the eating disorder literature at a general level by Lavender and colleagues (2006) and Humphreys and associates (2007), further research is necessary to determine the extent that intolerance of uncertainty in eating disorders is limited to domains of eating, shape, and weight.

**Importance of thoughts and eating disorders.** Importance of thoughts is an obsessive compulsive cognition that has gained considerable attention, with related constructs being examined in the literature on anxiety disorders and eating disorders (Salkovskis, Shafran, Rachman, & Freeston, 1999; Shafran, Thordarson, & Rachman, 1996). With respect to OCD, Thought-Action Fusion (TAF) has been linked to the overvaluation of the importance of thoughts and the urge to engage in neutralising behaviours (Shafran et al., 1996). Two components of TAF have been identified, including moral TAF, the belief that thoughts are the moral equivalent to actions, and likelihood TAF, the belief that the presence of a thought increases the likelihood of the action or event associated with the thought occurring (Amir, Freshman, Ramsey, Neary, & Brigidi, 2001; Berle & Starcevic, 2005; Marino, Lunt, & Negy, 2008; Shafran, 2002; Shafran & Robinson, 2004). To illustrate this, an individual who demonstrates likelihood TAF would maintain the belief that thinking about a family member being in a car accident would increase the likelihood that an accident will occur. By contrast, if the
individual has characteristics of moral TAF, thinking about harming another person would be considered the moral equivalent to actually causing harm.

In research utilising OCD samples and nonclinical controls, TAF has been associated with obsessional beliefs on the MOCI, the Padua Inventory, and the Obsessive-Compulsive Inventory (OCI) (Amir et al., 2001; Shafran et al., 1996; van Oppen, Hoekstra, & Emmelkamp, 1995). The likelihood domains of TAF are more strongly related to OCD symptoms and obsessive beliefs, a finding that has been replicated across studies (Shafran et al., 1996; Shafran & Rachman, 2004). By contrast, moral TAF has shown less association with OCD, with symptoms of depression often mediating the relationship between moral TAF and obsessive-compulsive symptoms (Shafran et al., 1996). Refer to the article by Shafran and Rachman (2004) for a detailed review of the literature on TAF and OCD.

A derivative of TAF, Thought-Shape Fusion (TSF), has been identified in research on dieters and women with eating disorders (Shafran, 2002; Shafran, Teachman, Kerry, & Rachman, 1999). Three components of TSF have been documented. These include moral TSF, the belief that thinking about eating is morally equivalent to eating; likelihood TSF, the belief that thinking about food increases the risk of gaining weight; and feeling TSF, the belief that thinking about weight increases feelings of overweight (Shafran, 2002). Individuals reporting high scores on likelihood TSF acknowledge that thinking about weight gain does not directly cause a change in body shape or weight and as such, this represents an irrational or dysfunctional belief rather than delusional phenomena (Shafran & Robinson, 2004). TSF in eating disorders operates in a similar way to TAF in OCD since patients overestimate the importance of thoughts and the likelihood that these thoughts will result in a feared event (e.g., weight gain). Such an appraisal may increase the urge to neutralise or control the thought, prompting engagement in disordered eating behaviours (Shafran, 2002; Shafran & Robinson, 2004).
Shafran (2002) reports on an experimental study that examined TSF in a sample of 30 students who demonstrated high scores on this construct. It was found that increasing thoughts about eating a forbidden food amplified feelings of guilt, feelings that the individual was likely to gain weight, and feelings that the individual was overweight. These emotions were associated with heightened levels of anxiety and an impulse to engage in checking behaviours to reduce or neutralise feelings of distress (Shafran, 2002). This study has been replicated in a study by Radomsky, de Silva, Todd, Treasure, and Murphy (2002) who examined a sample of 20 female inpatients with AN. Psychometric and experimental data indicated the presence of TSF among inpatients with AN. It was reported that 75% of the sample engaged in neutralising behaviours in order to control anxiety and reduce fears of being overweight and the likelihood of weight gain. Those participants without the urge to neutralise reported lower overall scores of TSF than their neutralising counterparts, fewer feelings of guilt associated with eating, and fewer fears of weight gain. These participants also had lower scores on the MOCI and fewer depressive symptoms. Interestingly, the urge to complete a compulsion diminished over time across both the neutralisers and non-neutralisers, indicating that among AN patients, anxiety ultimately diminishes whether a compulsion is engaged in or not (Radomsky et al., 2002).

In order to examine variations in TSF severity across eating disorder presentations, Shafran and Robinson (2004) recruited 42 women with an eating disorder (10 with AN, 10 with BN, and 22 with EDNOS) and 42 women with no history of disordered eating. Eating disorder patients demonstrated significantly more TSF on the newly developed TSF Questionnaire (Shafran, Teachman, Kerry, & Rachman, 1999) when compared with controls. In addition, a direct relationship was noted between severity of eating disorder symptoms on the EDE-Q and intensity of TSF. Aside from body checking and avoidance behaviours and BMI, all associations between TSF and eating disorder symptoms remained significant after controlling for
depression. It was concluded that concerns over body, shape, and weight may be an expression of overevaluating the importance of thoughts by means of TSF, a process that may also serve to maintain the disorder longitudinally (Shafran & Robinson, 2004).

By conceptualising preoccupations with body, shape, and weight as manifesting in fears of weight gain or changes in body shape, aspects of eating disorders may be viewed as a form of anxiety in terms of the threat of undesirable events and consequences. In the context of research on TSF, it is evident that many of the irrational fears associated with obsessional beliefs are evident in individuals with eating disorders, albeit in the domains of eating, shape, and weight. Further assessment of the appraisals of thoughts and the perceived consequences of the presence of a thought alone will enhance knowledge as to whether women with eating disorders overemphasise the importance of thoughts in a similar manner to those with OCD.

Control of thoughts and eating disorders. Control is a central feature to the development and persistence of an eating disorder (American Psychiatric Association, 2000; Rothernberg, 1986). This applies to behaviour management strategies with regards to weight control, dietary restriction, rituals surrounding body checking, and thoughts about body shape (Harnden, McNally, & Jimerson, 1997; Rothernberg, 1986). It has been suggested that diuretic and laxative use demonstrate a drive for control over bodily functions, whilst others have argued that amenorrhea can (at times) be viewed as a determinant of successful control (Rothernberg, 1986). In relation to the interactions between cognitive and behavioural processes, loss of control is a primary determinant of both objective and subjective forms of binge eating, and loss of control over body weight is a common fear reported by eating disorder patients (Meyer, Waller, & Watson, 2000; Rothernberg, 1986).

Strong preoccupations about eating, shape, and weight, and the longstanding relationship between obsessionality and thought suppression has prompted researchers to examine suppression strategies as a mode of cognitive control in eating
disorders (Meyer et al., 2000). Thought suppression may be defined as attempting to remove a thought from consciousness, typically due to the anxiety, distress, or feared consequences that are associated with the thought (McLaren & Crowe, 2003; Rassin, Merckelbach, & Muris, 2000). There is general agreement that thought suppression can paradoxically lead to an increased incidence of the thought, known as the rebound effect (Purdon, 2004; Rassin & Diepstraten, 2003). Wegner (1989) has proposed that the development of obsessions is directly related to this process, since “an obsession can grow from nothing but the desire to suppress a thought” (p. 167). Wegner suggests that preoccupations with given stimuli may arise following failed attempts at control or suppression.

Harnden and colleagues (1997) examined thought control strategies in 19 female dieters and 21 female nondieters. The authors requested that participants not think about weighing themselves for a five-minute period, and asked participants to verbalise their thoughts during this interval. It was hypothesised that dieters would have greater difficulty suppressing thoughts than nondieters, and that dieters would exhibit a greater rebound effect. Although weight-related cognitions were more frequent among dieters, only nondieters exhibited a rebound effect. It was suggested that dieters may engage in suppression processes about weighing to such intensity, that the brief experiment incorporated in the study was insufficient to generate a rebound effect for these participants (Harnden et al., 1997). Analogous to Wegner’s (1994) contention, it was concluded that thought suppression may represent a catalyst for preoccupations to develop (Harnden et al., 1997). These findings indicate that at least among dieters, thought control strategies may be utilised to manage anxiety and distress surrounding eating, shape, and weight concerns. Further research is necessary to determine whether thought control strategies of this nature are employed by individuals with eating disorders, and if so, whether control strategies are only utilised for thoughts
surrounding eating, shape, and weight or whether control strategies are evident in other thought content domains.

**Inflated responsibility and eating disorders.** According to the OCCWG (1997), a sense of inflated responsibility stems from maladaptive assumptions about one’s ability to prevent negative events. Individuals with OCD report that by engaging in rituals, the risk associated with negative events is averted. These beliefs also apply to eating disorders, given that individuals with AN exhibit general values about responsibility through their high level of conscientiousness, adherence to the societal rules, and avoidance of harm (Casper, Hedeker, & McClough, 1992; Vitousek & Manke, 1994). Studies that have measured responsibility in the context of eating disorders have not utilised a measure of inflated responsibility nor have they evaluated responsibility beliefs as they pertain to neutralisation of thought processes and minimisation of the threat of negative events.

Although it has been suggested that responsibility beliefs in eating disorders may not extend beyond the domains of eating, shape, and weight, domain-specific responsibility appraisals are not limited to eating disorders and also extend to the subtypes of OCD (Rachman, 2002). Rachman (2002) suggests that checking rituals in OCD are associated with risk of harm to others rather than self, whilst cleaning rituals are more self-directed. Based on the premise that the responsibility to lose weight or maintain a certain weight has a primary focus on self, a sense of inflated responsibility towards others has not been measured in an eating disorder sample. It would be valuable to evaluate this relationship among a clinical eating disorder sample as well as assess whether responsibility beliefs extend beyond eating, shape, and weight domains in this population.

**Overestimation of threat and eating disorders.** Overestimation of threat is a cognitive component of all anxiety disorders, including OCD, GAD, PTSD, specific phobia, and social phobia (OCCWG, 1997, 2001). The domain underlying
overestimation of threat differs both between and within each disorder (OCCWG, 1997). For example, overestimation of threat in OCD may be concerned with risk of harm to family members due to the presence of an intrusive thought; in arachnophobia it may be associated with the risk of being bitten, hurt or even killed by a spider; whilst in social phobia, the threat may be concerned with a fear of rejection by others. Research has demonstrated that individuals with eating disorders also have domain specific overestimations of threat, as they exaggerate the risk of not exercising, the risk of gaining weight or eating even small amounts of food, or the social consequences associated with weight gain (Cooper & Hunt, 1998; Cooper & Turner, 2000; Meyer et al., 2000; Shafran, 2002). In this regard, it has been speculated that overestimation of threat is likely to predate the existence of an eating disorder, but also contribute to its maintenance and resistance to treatment, particularly if threat beliefs are not overcome (Grilo, Shiffman, & Carter-Campbell, 1994).

Meyer and colleagues (2000) completed a study that examined threat estimations in relation to dietary restriction and bulimic symptoms. These authors recruited 50 nonclinical university student volunteers, and administered a word association task where participants were asked to find a target word from a list. Whilst some target words were neutral (e.g., fun, dale), others were associated with threat to self-esteem (e.g., fail, dumb). Each participant completed a series of trials where they were given variable amounts of time to find the words (e.g., 500, 1000, 1500, and 2000 milliseconds). Irrespective of the level of eating pathology, participants required more time to find the target words associated with a threat to self-esteem when they were provided with more time to do so. Women with bulimic symptoms were particularly slow for the longer intervals, a finding the authors interpreted as indicative of cognitive avoidance of ego-threatening stimuli. It was speculated that the defense mechanism is not active during brief trials as it only comes into effect when adequate processing time is available (Meyer et al., 2000). This study provided some preliminary evidence that
individuals with bulimic symptoms react differently to stimuli associated with threat when compared with neutral stimuli.

Smith and Rieger (2009) recently built on these findings in an examination of attentional bias with respect to food, shape, and weight. These authors recruited 172 female undergraduate psychology students, 98 of whom were allocated to a control group or one of several attentional training groups. Prior to completing a dot-probe task, participants in the control group were trained to attend to neutral words, whilst those in the attentional training groups were trained to attend to negative shape and weight words (e.g., fat), positive shape and weight words (e.g., slim), high calorie food words (e.g., cake), or low calorie food words (e.g., carrot). Results indicated that attentional bias in relation to negative shape and weight was associated with an exacerbation in body dissatisfaction, whilst high calorie food bias was associated with heightened dietary restriction. This study provided support for an etiological role of attentional biases in the development of food, shape, and weight concerns (Smith & Rieger, 2009). It is plausible that attentional bias is associated with overestimation of threat in the domains where fixations are most salient. In effect, individuals with eating disorders are more likely to focus attention on thoughts about food, body shape, and weight, thus the likelihood of overestimating threat in these domains may be elevated.

Whilst research to date has demonstrated overestimation of threat in eating disorders with regard to risks associated with eating conventional meals, and the impact of eating on shape and weight (Cooper & Hunt, 1998; Cooper & Turner, 2000), it is vital that research evaluate whether individuals with eating disorders overestimate threat among broader domains, or whether the threat is limited to variables such as self-esteem, and domains of eating, shape, and weight. It will also be valuable to assess differences in threat estimations across diagnostic categories. As mentioned previously in this review, BN patients engage in a greater frequency of risky and impulsive behaviours such as episodes of binge eating, substance use, shoplifting, and
suicide attempts. As such, further study of whether women with BN estimate threat differently to those with AN is warranted, and whether overestimation of threat is limited to body shape and weight domains, particularly among patients with BN.
Chapter 4

Rationale, Aims, and Research Questions

Although research on eating disorders has accumulated in recent decades and intervention programs have improved steadily, the effectiveness of current programs remains equivocal due to the profound resistance exhibited by eating disorder patients and the high relapse rates following a period of successful treatment (Fairburn et al., 2003b; Halmi et al., 2005a; Rushford, 2006; Steel, Farag, & Blaszczynski, 1995). It is apparent that aspects of the etiology and phenomenology of eating disorders are not clearly understood and may not be addressed in current treatments. One such area surrounds the conceptualisation of the cognitions relating to behavioural symptoms that manifest among individuals with disordered eating behaviours. Certainly the identification of body checking cognitions (Mountford et al., 2006) is a positive step, however, further research is necessary to determine whether these cognitions are similar across the different eating disorder categories. The association between these cognitions and the cognitive biases that are evident in individuals with OCD also warrants attention given the statistical comorbidity rates that have been identified within the literature. In effect, individuals with eating disorders may exhibit similar cognitive biases to those observed in OCD. By contrast, these individuals may retain a contrasting set of beliefs that are unique to those identified by the OCCWG. It is anticipated that the present research will provide some fruitful information regarding the contrasts and similarities in the cognitive beliefs and biases associated with eating disorders and OCD.

Recent findings of the OCCWG also present researchers and clinicians with a range of unanswered questions regarding disordered eating. Research has shown that individuals with AN and BN demonstrate symptoms of OCD that are significantly higher than controls, yet lower than individuals diagnosed with OCD (Godart et al., 2003; Milos et al., 2002; Morgan et al., 2007). It can be hypothesised that individuals with AN
and BN will report obsessive-compulsive cognitions of lesser severity than individuals with OCD, but to a larger extent than community controls. The degree to which these cognitions are restricted to the domain of eating, shape, and weight is also intriguing and thus, will be a major focus of the current research. Based on the gaps in the literature, the lack of research on cognitive aspects of OCD among eating disorder samples, and the strong rationale to examine cognitive structures in this population, the current research sought to examine the obsessive beliefs identified by the OCCWG among an eating disorder sample, a sample of participants with OCD, and participants with neither condition. Contemporary measures developed by the OCCWG were utilised to evaluate the presence of general beliefs regarding overestimation of threat and responsibility, overvaluation of the importance of and need to control thoughts, and beliefs about certainty and perfectionism. As previously noted, the DSM-IV-TR specifies that an individual cannot be diagnosed with OCD if obsessions and compulsions are limited to eating, shape, and weight domains (American Psychiatric Association, 2000). To investigate this constraint, a new measure was developed based on the OBQ-44, with items being re-worded to reflect the aforementioned domains where possible. Such a design facilitated comparisons between general and domain-specific obsessive beliefs. Relationships between general and domain specific obsessive beliefs could then be compared with broader measures of eating disorder psychopathology such as concerns over eating, shape, and weight, dietary restraint, compensatory behaviours, body checking behaviours, self-esteem, depression, and general symptoms of anxiety.

As stated in Chapter 1, findings of this research are presented across four studies. The first study compared eating disorder and obsessive-compulsive symptomatology, with a focus on variations in symptoms across diagnostic categories, whether specific eating disorder symptoms are associated with obsessive-compulsive symptoms or subtypes of OCD, and whether clinical scores of OCD are associated with
heightened eating disorder symptom severity. Based on past research, several research questions addressed in the first study are confirmatory analyses, and serve to examine the nature and severity of eating disorder and OCD symptomatology in the recruited sample, which will provide a foundation for more complex analyses in later studies within this investigation. Research questions to be addressed in Study 1 include:

1. Are there differences in concerns over shape and weight, or in the type, frequency, and intensity of disordered eating behaviours engaged in by eating disorder, OCD, depression, and community control groups?
2. Does the strength of association between shape and weight concerns and OCD symptoms differ across subtypes of OCD?
3. Are there differences in OCD symptoms across eating disorder, OCD, depression, and community control groups?
4. Do symptoms of OCD differ across the eating disorder categories (AN, BN, EDNOS, and unspecified eating disorder)?
5. Are more complex or severe forms of disordered eating associated with greater OCD symptoms than less complex or severe forms of disordered eating?

The aim of the second study was to examine obsessive beliefs measured by the OBQ-44 among women with eating disorders, OCD, depression, and community controls. Variations in obsessive beliefs across eating disorder diagnostic groups and across different disordered eating behaviours were also analysed. Research questions that were addressed include:

1. What is the strength of association between shape and weight concerns and general obsessive beliefs measured by the OBQ-44?
2. Are there differences in obsessive-compulsive cognitions across eating disorder, OCD, depression, and community control groups?
3. After controlling for general symptoms of OCD, are there significant differences in obsessive-compulsive cognitions when comparing individuals with eating disorders, OCD, depression, and community controls?

4. Are there differences in obsessive-compulsive cognitions across the eating disorder diagnostic categories?

In order to validate the newly developed Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV), the aim of Study 3 was to conduct a psychometric assessment of this measure. Factor analytic techniques were utilised to evaluate the factor structure of the OBQ-EDV, in addition to assessing the reliability and validity of this measure. The following research questions were addressed:

1. Based on factor analytic methods, do items within the OBQ-EDV cluster into the same constructs as the OBQ-44?
2. Does the OBQ-EDV demonstrate sound reliability with regards to internal consistency?
3. What is the strength of the intercorrelations within the OBQ-EDV?
4. Does the OBQ-EDV maintain a satisfactory level of face, content, criterion-related, and construct validity?

The aim of Study 4 was to examine differences in scores on the OBQ-EDV across an eating disorder group, clinical comparison groups, and a community control group. Comparisons were made between scores on the OBQ-44 and the OBQ-EDV, to evaluate whether obsessive beliefs are specific or more salient to the domains of eating, shape, and weight among the different clinical groups. The following research questions were addressed in Study 4:

1. Are there differences in obsessive beliefs on the OBQ-EDV when comparing women with eating disorders to those with OCD or depression?
2. Are there differences in obsessive beliefs on the OBQ-EDV across eating disorder diagnostic categories?
3. Do obsessive beliefs in the domain of eating, shape, and weight mediate the relationship between general obsessive beliefs and eating disorder symptoms measured by the EDE-Q?

4. Are women who score in the highest quartile on a measure of general obsessive beliefs more likely to score in the highest quartile on a measure of eating, shape, and weight specific obsessive beliefs and vice versa?

By addressing each of these research questions, it was hoped that the present research would clarify the relationship between the obsessive, repetitive, rigid, and ritualistic nature of OCD, and the cognitive constructs and behaviours underlying eating disorders. As outlined in Chapter 1, the current series of studies incorporated one large-scale sample of participants who completed a single questionnaire package. As the method employed for all studies was the same, the research design and methodology employed across all studies is described in Chapter 5. This includes a detailed summary of the sample utilised in the current research, as well as the measures and procedures employed. Detailed results and discussion is then presented independently for each of the four studies in subsequent chapters.
Chapter 5
Method

Participants

Overview of the sample. A nation-wide sample from within Australia was recruited to participate in the present research. A total of 1207 adult women were recruited, comprising both a community and clinical sample. Eating and anxiety disorder associations throughout Australia (e.g., Eating Disorders Foundation of Victoria, Anxiety Disorders Association of Victoria) assisted with recruitment of the community sample by advertising the study on their websites or in monthly and quarterly newsletters. Women were also informed about the study by means of two media releases, which promoted the study through radio and television sources, and the print media. In regards to the clinical sample, women who were receiving treatment for an eating disorder at an eating disorder treatment clinic (e.g., The Bronte Centre at St Vincent’s, The Oak House) were eligible to participate. A detailed summary of the recruitment methods is provided in the procedure later in this chapter.

Gender. All participants recruited to participate in the current research were female. The sample did not incorporate males as they represent a small minority among clinical eating disorder populations (approximately one in 10 individuals with an eating disorder are male), and males within the community typically demonstrate negatively skewed scores on eating disorder symptoms (American Psychiatric Association, 2000; Barlow & Durand, 2005; Wilson, 2005). As this research is exploratory in the sense that it aimed to identify the presence of obsessive-compulsive cognitions in the context of eating disorders, it was considered appropriate from a theoretical viewpoint to focus attention on those individuals who are most at risk for eating disorder symptoms. It is anticipated that findings from this research will guide further research with regard to incorporating male participants in future studies.
Residential state. Community members from each Australian state and territory were invited to participate, with participants being recruited from 545 different geographical locations around Australia. Of the 1207 women who were recruited, 722 (59.8%) were residing in Victoria, 210 (17.4%) in New South Wales, 117 (9.7%) in Queensland, 41 (3.4%) in Western Australia, 38 (3.1%) in the Australian Capital Territory (ACT), 31 (2.6%) in South Australia, and 9 (0.7%) in Tasmania. Thirty-nine participants (3.2%) opted not to report their residential state or territory.

Age. Participants were required to be aged 18 years and over to participate in the current research. The age of the sample ranged between 18 and 69 years ($M = 29.52, SD = 10.16$). Figure 1 displays a distribution of participant ages.

As shown, the distribution was positively skewed, with approximately half of the sample (53.1%, $n = 636$) aged between 18 and 27 years. There was adequate representation of women aged over 40 years, with 15.4% ($n = 194$) falling above this age category. Age of onset for eating disorders is predominantly during late
adolescence and early adulthood (American Psychiatric Association, 2000), and therefore the age distribution of this sample was representative of the group of women within Australia who are most at-risk for an eating disorder. This is supported by recent epidemiological studies conducted within Australia, which have shown decreases in eating disorder behaviours as age increases, with the greatest incidence of disordered eating behaviour reported during early adulthood (Mond, Hay, & Owen, 2006).

**Body Mass Index (BMI).** Based on self-reported estimates of height and weight, BMI (kg/m\(^2\)) was computed for each participant. BMI ranged from 12.50 to 63.54 (\(M = 24.13, SD = 6.06\)), and thus mean BMI was in the upper end of the normal weight range. Based on range classifications endorsed by the World Health Organization (2009), the distribution of BMI scores across the sample is displayed in Figure 2.

![Figure 2: Number of participants clustered into each BMI category.](image)

As shown, BMI scores for 56.7% (\(n = 684\)) of the sample fell within the normal weight range. Seven percent (\(n = 83\)) of the sample were mildly or moderately underweight, whilst 2.2% (\(n = 26\)) were severely underweight. Approximately 25% of
participants reported height and weight scores in the mild and moderately obese range. Three percent \((n = 34)\) of the sample were severely obese \((\text{BMI} > 40.00)\).

**Living arrangements.** Forty-two percent \((n = 511)\) of participants were living with a partner at the time of the study, 22.0\% \((n = 265)\) of whom were married whilst 20.4\% \((n = 246)\) were living in a defacto relationship. Twenty-seven percent \((n = 321)\) of participants were residing with one or both parents, whilst 18.1\% \((n = 219)\) were living with friends or roommates. Only 12.7\% \((n = 153)\) of participants were living alone. Three participants chose not to provide information regarding their current residential situation.

**Educational attainment.** Participants were asked about their current educational status and highest level of education achieved. Ninety-three percent \((n = 1125)\) of the sample had received a high school certificate. A large proportion also attended tertiary education, with 33.7\% \((n = 407)\) reporting completion of an undergraduate university degree and 19.1\% \((n = 231)\) reporting completion of a postgraduate university program. Eleven percent of participants reported that they had completed a TAFE course.

A large proportion of the sample (47.1\% , \(n = 568)\) were also completing studies at the time of participation. Of these, a minority were completing secondary school (6.5\% , \(n = 20)\) or TAFE courses (3.5\% , \(n = 37)\). In excess of 85\% of participants who were studying were attending university, with 56.7\% \((n = 324)\) and 28.7\% \((n = 164)\) of participants completing undergraduate and postgraduate university programs respectively. Three participants reported engagement in another form of education (e.g., a private dance course). Two percent of the sample did not provide information regarding their educational history or current educational status.

**Diagnostic history.** Participants were asked to report on their history of mental illness, namely whether they had been diagnosed with a psychological condition and whether they had received treatment for this condition. For ease of interpretation, a
detailed description of the psychopathological history of participants is provided in Chapter 6, as this data was used to categorise participants into clinical groups (eating disorder, OCD, depression) and a community control group.

**Measures**

Participation in the current research involved completion of a single questionnaire package, which could be completed either online or via a hardcopy pen-and-paper questionnaire. The measures incorporated within the questionnaire package are summarised in Table 1. A description of the psychometric properties and efficacy of each measure is then provided.
Table 1

**Summary of Self-Report Measures Incorporated in the Questionnaire Package**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Authors (Year Published)</th>
<th>Subscales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics questionnaire</td>
<td>Designed for the current research</td>
<td>None</td>
</tr>
<tr>
<td>Eating Disorders Examination – Questionnaire (EDE-Q)</td>
<td>Fairburn &amp; Beglin (1994)</td>
<td>Restraint, Weight Concern, Shape Concern, Eating Concern</td>
</tr>
<tr>
<td>Obsessive Compulsive Inventory – Revised (OCI-R)</td>
<td>Foa et al. (2002)</td>
<td>Washing, Checking, Ordering, Obsession, Hording, and Mental Neutralisation</td>
</tr>
<tr>
<td>Obsessive Beliefs Questionnaire (OBQ-44)</td>
<td>OCCWG (2005)</td>
<td>Perfectionism/Intolerance of Uncertainty, Responsibility/Overestimation of Threat, and Importance/Control of Thoughts</td>
</tr>
<tr>
<td>Body Checking Questionnaire (BCQ)</td>
<td>Reas et al. (2002)</td>
<td>Appearance, Specific Body Parts, Idiosyncratic Checking</td>
</tr>
<tr>
<td>Depression, Anxiety, Stress Scale (DASS)</td>
<td>Lovibond &amp; Lovibond (1995)</td>
<td>Depression, Anxiety, and Stress</td>
</tr>
<tr>
<td>Body Checking Cognitions Scale (BCCS)</td>
<td>Mountford et al. (2006)</td>
<td>Objective Verification, Reassurance, Safety Beliefs, Body Control</td>
</tr>
<tr>
<td>Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV)</td>
<td>Designed for the current research</td>
<td>To be evaluated</td>
</tr>
<tr>
<td>Rosenberg Self-Esteem Scale</td>
<td>Rosenberg (1965)</td>
<td>None</td>
</tr>
</tbody>
</table>
Demographics questionnaire. A brief demographics questionnaire was developed for the purposes of the current research. Information pertaining to each participant’s age, current living arrangements, and educational background was obtained, in addition to height and weight data to assess BMI. Each participant’s current postcode was also requested, in order to determine differences in the distribution of participants across Australian states and territories.

Since many participants were recruited from clinical settings, information regarding their personal history of mental illness was obtained. Eating and anxiety disorder associations (e.g., Eating Disorders Foundation of Victoria) were also targeted for recruitment, and thus a proportion of women in the community were also likely to have a history of psychopathology. Participants were asked whether they had been diagnosed with a psychological condition in the past, and if so, what was the name (or names) of the condition (or conditions). Convergent evidence for a self-reported diagnosis was established by comparing diagnostic information to scores on self-report measures such as the EDE-Q and OCI-R.

For those participants who reported a history of mental health issues, demographic information regarding treatment history was requested. Participants were asked whether they had sought assistance from a healthcare professional for a psychological issue, and if so, the nature of the issues for which they sought help. For those participant’s who had sought assistance, information about when they first sought help, when they most recently sought help, who they consulted (e.g., General Practitioner, psychiatrist, psychologist), and how many appointments or sessions they have attended in regards to their psychological issue was obtained.

Eating Disorders Examination – Questionnaire (EDE-Q). The 36-item EDE-Q is a self-report equivalent of the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993; Fairburn & Beglin, 1994). The EDE is a structured clinical interview that assesses core aspects of eating disorder pathology, and is
currently considered the gold standard of eating disorder assessment (Fairburn & Beglin, 1994; Mond et al., 2006). All interview questions within the EDE are replicated within the EDE-Q, with the EDE-Q measuring cognitive and behavioural elements of eating disorders experienced over the past 28 days across four subscales: Restraint (five items), Eating Concern (five items), Shape Concern (eight items), and Weight Concern (five items). Items within the Restraint, Weight and Shape Concerns subscales are also combined to provide a global EDE-Q score.

Items one to 14 of the EDE-Q evaluate disordered eating attitudes and behaviours (e.g., Have you been deliberately trying to limit the amount of food you eat to influence your shape and weight?) and are rated on a 7-point Likert scale, ranging from ‘0’ = ‘no days’ to ‘6’ = ‘everyday’. Items 15 to 28 assess the occurrence and frequency of disordered eating behaviours typical of individuals with AN or BN, incorporating objective and subjective binge eating, loss of control whilst eating, self-induced vomiting, laxative and diuretic use, and exercising hard as a means of controlling shape and weight. Items 29 to 36 measure dissatisfaction and distress associated with body shape and weight (e.g., How dissatisfied have you felt about your weight?), with items being rated on a 7-point Likert scale, ranging from ‘0’ = ‘not at all’ to ‘6’ = ‘markedly’.

Psychometric assessment of the EDE-Q has focused on similarity and consistency between the EDE and EDE-Q. Strong agreement between these two measures has been found among general population community samples (Fairburn & Beglin, 1994), substance abusers (Black & Wilson, 1996), and clinical samples of AN and BN (Sysko, Walsh, & Fairburn, 2005). Internal consistency of the EDE-Q global score has been reported as .93 when compared with .90 for the EDE (Mond, Hay, Rodgers, Owen, & Beaumont, 2004a). Luce and Crowther (1999) reported test-retest reliability of the EDE-Q over a two-week period as
ranging from .81 to .94 for the four subscales, a finding that has since been replicated by Mond and colleagues (2004a). Less stability and general agreement between the EDE and EDE-Q has been reported in regards to the core behavioural features of eating disorders, particularly with regard to the measurement of binge eating (Mond, Hay, Rodgers, Owen, & Beumont, 2004b). Although Mond and colleagues (2004b) contend that this reflects the difficulty of measuring binge eating via self-report, this restriction is a limitation of the validity of this measure. Superior stability has been observed among other disordered eating behaviours such as self-induced vomiting, excessive exercise, and the use of laxatives and diuretics (Fairburn & Beglin, 1994).

Based on its sound psychometric properties, ease of administration, and the availability of Australian norms (Mond et al., 2006), the EDE-Q is most often used as a treatment outcome measure or in screening for eating disorders in the community (Mond et al., 2004b). Average item scores of four or higher on the EDE-Q are considered to be within the clinical range (Fairburn & Beglin, 1994). More stringent criteria have been utilised by authors such as Shafran and colleagues (2007), who identified cases as those individuals who reported OBEs, compensatory behaviours, and scores of four or higher on the Restraint items of the EDE-Q. Researchers have recently developed advanced EDE-Q clinical cut-off scores based on Receiver Operating Characteristic (ROC) analysis and discriminant functions (Mond et al., 2004b). Mond and colleagues (2004b) found that an average item EDE-Q global score greater than 2.3 in addition to the presence of OBEs and exercising hard yielded the most accurate classification of an eating disorder. This criteria has subsequently been adopted by Mountford and colleagues (2006) to identify possible eating disorder cases, although excessive exercise was excluded on the bases that a large proportion of participants were identified based on this criterion alone.
Obsessive-Compulsive Inventory – Revised (OCI-R). The OCI-R is an 18-item self-report measure of the core symptoms of OCD. The development of this measure was based on the original 42-item OCI, which was a theoretically derived measure (Foa et al., 1998). Both the OCI and OCI-R have been employed to assess clinical symptoms in community samples, clinical samples with OCD, and anxious controls (Foa et al., 1998; Foa et al., 2002; Simonds, Thorpe, & Elliott, 2000). The OCI-R was reported to improve the original OCI in three ways, including simplification of scoring, minimisation of overlap between subscales, and elimination of the redundant frequency of symptoms scale. The original development of the OCI asked participants to rate each item in terms of distress and frequency, however psychometric assessment indicated that participant scores on these two scales yielded highly comparable totals, and strong intercorrelations, \( r = .92 \). Only the distress scale has been retained in the OCI-R (Foa et al., 2002). The OCI-R provides a total score as well as six subscale scores that evaluate obsessive thought patterns and compulsive behaviours in the categories of Washing, Checking, Ordering, Obsession, Hoarding, and Mental Neutralisation. Items within the OCI-R are rated on a 5-point Likert scale ranging from ‘0’ = ‘not at all’ to ‘4’ = ‘extremely’, and thus total scores range from 0 to 72.

Psychometric assessment of the OCI-R was completed across individuals with OCD, social phobia, and PTSD, as well as a non-anxious control group (Foa et al., 2002). The OCI-R has demonstrated sound internal consistency, with Cronbach’s alpha ranging from .81 to .93 for the total score. Internal consistency for the subscales exceeds .8 for OCD groups and typically exceeds .7 for other clinical and non-clinical groups (Foa et al., 2002). Test-retest reliability over a two-week period for OCD patients and one-week for controls indicated stability coefficients ranging from .57 to .91 (Foa et al., 2002). The OCI-R maintains
acceptable intercorrelations among subscales, although higher intercorrelations have been observed for nonclinical controls when compared with OCD patients (Foa et al., 2002). This is understandable based on controls demonstrating low scores across subscales when compared with OCD patients who often present with a primary compulsive behaviour domain that accounts for much of their distress (e.g., repetitive checking). Discriminant validity has been demonstrated across diagnostic groups using the Beck Depression Inventory (BDI; Beck & Steer, 1987) and the Hamilton Rating Scale for Depression (Foa et al., 2002). Convergent validity with the Yale-Brown Obsessive-Compulsive Scale, the Global Obsessive Compulsive Scale (Goodman & Price, 1992), and the MOCI is also promising (Foa et al., 2002; Hajcak, Huppert, Simons, & Foa, 2004). A cut-off score of 21 correctly classifies 65.6% of participants as OCD or non-OCD patients, whilst a cut-off score of four on the Obsession subscale correctly classifies 74.4% of participants (Foa et al., 2002).

**Multidimensional Perfectionism Scale (MPS-F).** The 35-item MPS-F, developed by Frost and colleagues (1990), was used to measure self-perceptions of perfectionism. In addition to providing a total perfectionism scale, this measure clusters perfectionistic tendencies into six subscales including Concern Over Mistakes, Personal Standards, Parental Expectations, Parental Criticisms, Doubts About Actions, and Organisation. Items are measured on a 5-point Likert scale ranging from ‘1’ = ‘strongly disagree’ to ‘5’ = ‘strongly agree’. Psychometric properties of the MPS-F are satisfactory, with an internal consistency coefficient of .90 for the MPS-F total score, with internal consistency for the subscales ranging from .77 (Doubts About Actions) to .93 (Organisation) (Frost et al., 1990). Convergent validity has been demonstrated through correlations between the MPS-F total score and the Burns Perfectionism Scale ($r = .85$; Burns, 1983), the
Irrational Beliefs Test \( (r = .58; \text{Jones, 1968}) \), and the Perfectionism subscale of the EDI \( (r = .59) \) (Frost et al., 1990).

The MPS-F has been widely incorporated into eating disorder research (Bastiani et al., 1995; Bulik et al., 2003; Halmi et al., 2000). Halmi and colleagues (2000) reported correlations between eating disorder diagnostic categories and all subscales of the MPS-F aside from Organisation. The Concern Over Mistakes and Doubts About Actions subscales demonstrate particularly strong associations with eating disorder symptomatology (Bulik et al., 2003; Minarik & Ahrens, 1996). This measure has also been associated with elevated scores of depression, generalised anxiety, and OCD symptoms (Blatt, 1995; Frost et al., 1990; Frost & Henderson, 1991). Specifically, the MPS-F total score was found to correlate with all subscales on the MOCI aside from Slow (Frost et al., 1990).

**Obsessive Beliefs Questionnaire (OBQ-44).** The 44-item OBQ-44 is a recently developed measure of the cognitive constructs linked to the beliefs and appraisals associated with obsessive-compulsive symptoms (OCCWG, 2005). The OBQ-44 is a revised version of the original OBQ-87 and the Interpretation of Intrusions Inventory (III-31). The six theoretically derived subscales of the OBQ-87 (Overestimation of Threat, Intolerance of Uncertainty, Importance of Thoughts, Control of Thoughts, Responsibility, and Perfectionism) and the three subscales of the III-31 (Control of Thoughts, Importance of Thoughts, Responsibility) were thought to encapsulate those cognitive domains that were central to OCD. Despite encouraging preliminary analysis of the psychometric properties of these tools with regards to internal consistency, and convergent and discriminant construct validity, subscales within these measures were found to be highly intercorrelated (OCCWG, 2003). Based on the lack of discrimination between subscales, the OBQ-44 was developed based on empirical analysis and factor analytic techniques (OCCWG, 2005). The revised OBQ-44 contains three subscales, Perfectionism/Intolerance of Uncertainty,
Responsibility/Overestimation of Threat, and Importance/Control of Thoughts, and also provides an obsessive beliefs total score. Items are rated on a 7-point Likert scale, ranging from ‘1’ = ‘disagree very much’ to ‘7’ = ‘agree very much’. Intercorrelations between the three OBQ-44 subscales are moderate for OCD samples ($r = .42$ to $r = .57$) and moderate to strong for non-OCD samples ($r = .64$ – .72) (OCCWG, 2005). A Cronbach’s alpha coefficient of .95 was obtained for the OBQ-44 total score, and ranged from .89 to .93 for the three subscales, with similar internal consistency coefficients being obtained across OCD and non-OCD samples (OCCWG, 2005).

Convergent validity has been demonstrated when comparing the OBQ-44 with the Revised Padua Inventory across the Harm Impulses, Harm Thoughts, Grooming, Checking, and Contamination subscales (OCCWG, 2005).

**Body Checking Questionnaire (BCQ).** Developed by Reas and colleagues (2002), the 23-item BCQ was employed to assess three elements of body checking: Overall Appearance, Specific Body Parts, and Idiosyncratic Checking. Items within the BCQ are rated on a 5-point Likert scale, ranging from ‘1’ = ‘never’ to ‘5’ = ‘very often’. Confirmatory factor analysis has provided evidence for the three factor structure, with internal consistency coefficients ranging from .83 to .92 for the three subscale scores. Test-retest reliability for the BCQ over seven to 21 days ($M = 14$ days) was .94 for the BCQ total score, and ranged from .90 to .94 for the subscales. Convergent validity has been demonstrated with strong correlations found between the BCQ and the Body Shape Questionnaire, the EAT-26, and the Body Image Avoidance Questionnaire (Reas et al., 2002). Evidence for discriminant validity has also been obtained, with no significant correlation found between the BCQ and the Shipley Test of Verbal Intelligence (Reas et al., 2002). Eating disorder patients score significantly higher on this measure when compared with non-clinical controls (Reas et al., 2002).

**Depression, Anxiety, Stress Scale (DASS).** The 21-item Depression, Anxiety, Stress Scale (DASS-21), developed by Lovibond and Lovibond (1995), was used to
measure general psychopathology. This measure contains three seven-item subscales (Depression, Anxiety, and Stress) and also yields a total score. Items within the DASS-21 are rated on a 4-point Likert scale, where ‘0’ = ‘Did not apply to me’ and ‘3’ = ‘Applied to me very much, or most of the time’. When compared with the longer form (DASS-42), the DASS-21 has been reported to have a more precise factor structure with weaker intrafactor correlations (Antony, Bieling, Cox, Enns, & Swinson, 1998).

Both the long and short versions of the DASS have been administered across a range of cultures, incorporating both community and clinical (e.g., Major Depression, OCD, Panic Disorder with or without Agoraphobia, Social Phobia, Specific Phobia) populations (Crawford & Henry, 2003; Lovibond & Lovibond, 1995; Ng et al., 2007; Norton, 2007). An internal consistency coefficients of .93 has been obtained for the DASS-21 total score (Henry & Crawford, 2005), with coefficients of .87 to .94 being reported for the three subscales (Antony et al., 1998). Moderate to high correlations have been found between the DASS-21 and the BDI, the Beck Anxiety Inventory (Beck & Steer, 1990), and the State Trait Anxiety Inventory – Trait Version (Antony et al., 1998; Lovibond & Lovibond, 1995; Spielberger, 1983). Group-based analysis by Antony and colleagues (1998) has revealed that individuals with a diagnosis of depression tend to score highest on the Depression and Stress subscales, whilst individuals with Panic Disorder score highest on the Anxiety subscale. These authors have also found that clinical groups score significantly higher across all subscales when compared with non-clinical controls (Antony et al., 1998).

**Body Checking Cognitions Scale (BCCS).** The recently developed 19-item BCCS was used to assess cognitions that relate to body checking (Mountford et al., 2006). As described in Chapter 2, subscales incorporated within this measure include Reassurance, Objective Verification, Body Control, and Safety Beliefs. Items within the BCCS are measured across four subscales on a 5-point Likert scale, where ‘1’ = ‘never’ and ‘5’ = ‘very often’. As this measure evaluates a new domain of body
checking, validity data is still accumulating and is currently not comprehensive. However, this measure has been shown to be internally consistent with Cronbach’s alpha coefficients ranging from .72 to .86 for the four subscales (Mountford et al., 2006). Criterion validity with the BCQ and the EDE-Q has also been demonstrated (Mountford et al., 2006).

**Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV).**

The Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV) is a modified version of the OBQ-44. This measure was designed for the purposes of the current research and examines obsessive beliefs measured by the OBQ-44 in the domains of eating, shape, and weight. A thorough development process was incorporated in formalising items contained within the OBQ-EDV. In developing the items for this new measure, consultation was undertaken with psychologists working in clinical practice with eating disorder populations at the Bronte Centre at St Vincent’s. In addition, advice and feedback was sought from clinically trained psychologists working in research settings. This process was completed both prior to and following the development of items within the measure. The overall aim of the new measure was to design a psychometric assessment of obsessive beliefs, as measured by the OBQ-44, however with items that enabled an assessment of cognitive and behavioural elements of eating disorders. Where possible, items within the OBQ-44 were re-worded to examine obsessive beliefs specific to eating, shape, and weight domains. For example, the item “Having a blasphemous thought is as sinful as committing a sacrilegious act” was altered to read “Having a thought about eating large amounts of food is as bad as actually eating the food”. In this item, the obsessive belief, Importance of Thoughts, was assessed in the context of Eating Concern and the impact of eating on shape and weight. An even balance of items that tapped into eating, shape, and weight domains was obtained. Domain specific adaptations were possible for 31 of the 44 items within the OBQ-44. The 31 OBQ-EDV items were clustered into three obsessive belief
subscales, which are equivalent to those contained within the OBQ-44:
Perfectionism/Intolerance of Uncertainty, Responsibility/Overestimation of Threat, and Importance/Control of Thoughts. Items within the OBQ-EDV are measured on a 7-point Likert scale, ranging from ‘1’ = ‘disagree very much’ to ‘7’ = ‘agree very much’.

The psychometric properties of the OBQ-EDV have not yet been evaluated, however a detailed psychometric analysis will be presented in Chapter 9. Confirmatory factor analysis will be conducted to evaluate the factor structure of the OBQ-EDV, whilst assessment of reliability with regards to internal consistency and item-total correlations will also be carried out. Validity of the OBQ-EDV will be evaluated in the context of face, content, criterion-related, and convergent and discriminant construct validity. Refer to Appendix E to view items contained within the OBQ-EDV.

**Rosenberg Self-Esteem Scale.** The Rosenberg Self-Esteem Scale is a 10-item unidimensional measure of global self-esteem (Rosenberg, 1965). Items within this measure evaluate aspects of self-concept and self-worth on a 4-point Likert scale, ranging from ‘1’ = ‘strongly disagree’ to ‘4’ = ‘strongly agree’, with total scores ranging from 10 to 40. Cronbach’s alpha coefficient for the Rosenberg has ranged from .74 to .80 across both adolescent (McCarthy & Hoge, 1982) and adult samples (Shahani, Dipboye, & Phillips, 1990), whilst test-retest reliability over a two-week period has been reported at .85 (Silber & Tippett, 1965). Convergent validity has been demonstrated with the Coopersmith Self-Esteem Inventory (Crandal, 1973), the Kelly Repertory Test (Kelly, 1955), the Health Self-Image Questionnaire (Heath, 1965), and interview ratings of self-esteem (Silber & Tippett, 1965). When compared with the Coopersmith Self-Esteem Inventory (Coopersmith, 1967), the Rosenberg has demonstrated superior convergent validity when utilised among dieting disordered patients (Griffiths et al., 1999). Psychometric analysis of the Rosenberg Self-Esteem Scale has shown that low scores on this measure are associated with psychological indicators such as
depression, anxiety, and less acceptance from one’s peer group (Griffiths et al., 1999; Rosenberg, 1965).

**Procedure**

The current research was conducted across multiple sites with affiliated authors from both RMIT University and La Trobe University. As such, ethics approval was sought from both the RMIT Human Research Ethics Committee (HREC) and the La Trobe University Human Ethics Committee (HEC). Refer to Appendix F to view ethics approval letters for these sites.

**Development of the research website.** The research website could be accessed at www.rmit.edu.au/psychology/whatsreallyeatingyou. This website contained a brief summary about the research, inclusion criteria for participation, contact details for the primary researcher, and links to the Plain Language Statement (Refer to Appendix G) and support services. A link was also provided for participants to access the online version of the questionnaire package. The online questionnaire was designed in consultation with the RMIT University Information Technology Services Department and SurveyMonkey. SurveyMonkey are profit-based corporation that provide organisations such as research institutes, university faculties, and sporting associations with a safe and secure server to launch online questionnaires. A detailed letter was provided to the ethics committees from the owners of SurveyMonkey detailing the provisions taken to safeguard participant information on the SurveyMonkey server (Refer to Appendix H to view a copy of this letter). Additional funding from the research budget was allocated to purchase Secure Sockets Layer (SSL) encryption from SurveyMonkey. This encryption technology is typically used when transmitting confidential information as it ensures a secure connection between a participant and the server. SSL encryption provided an additional level of security for the transfer and storage of private and confidential information.
Where possible, the design and layout of the online questionnaire was equivalent to that of the hardcopy version. All items within the two versions were identical, with the measures in the package being presented in the same order. As was the case with the hardcopy questionnaire, no identifying information was required for the online version. Participants were asked to complete the questionnaire during one sitting as an identifiable coding system could not be developed using the SurveyMonkey server. A progress bar was included on the online measure to enable participants to estimate their progress and a possible completion time.

Recruitment of the community sample.

Eating and anxiety disorder associations. Eating and anxiety disorder associations throughout Australia (e.g., Eating Disorders Foundation of Victoria, Anxiety Disorders Association of Victoria) were initially contacted by phone to discuss avenues to communicate information about the current research to association members and the general community. A list of the organisations contacted is provided in Appendix I. Several associations were able to provide a summary of the research on their website or newsletter, inviting association members and general members of the community to participate. These summaries described the nature of the study and the inclusion criteria for participation. For advertisements placed online, links were also provided to access the study webpage, a Plain Language Statement, and a flyer for the study (Refer to Appendix J for a copy). The contact details of the primary researcher were also provided if participants had any queries or opted to have a hardcopy questionnaire sent out. Several associations charged a fee (typically between $20 and $50) to advertise research projects on their website for a given period of time (e.g., 6 or 12 months).

University students. Permission was sought from university administration services to place research flyers on local university campuses, namely the City and Bundoora West campus of RMIT University, and the Bundoora campus of La Trobe
University. Provided permission was granted, flyers were placed on student noticeboards within university departments, student accommodation centres, and in cafeterias.

Department heads and course coordinators at RMIT University and La Trobe University were also contacted via email to discuss the potential for recruitment of participants from within their courses. Subsequent to approval being received, the primary researcher attended lectures and tutorials to invite students to participate. Students were informed of the nature of the study, and that participation in the study was not for course credit and was both voluntary and anonymous. Students were not pressured to participate in any way and had the right to withdraw at any time, provided their data could be readily identified. Students were informed that the questionnaire package could be completed either online or via a pen and paper questionnaire. Questionnaire booklets and study bookmarks (refer to Appendix K for a copy of the bookmark) were left at the front of the lecture theatre. Participants were not asked to complete the questionnaire package during class time and returned any completed hardcopies in a supplied reply paid envelope.

**Media releases.** With the assistance of the RMIT University Department of Media and Communications, press releases were distributed to the Australian media during September, 2008 and May, 2009. The first press release provided background information about the research, a summary of the aims and objectives, and a description of the population the researchers endeavoured to recruit. As this release was distributed during the early stages of the recruitment phase, preliminary findings could not be reported (A copy of the September, 2008 press release is provided in Appendix L). The second press release reported on the preliminary findings of the 407 participants that had been recruited thus far. Reported findings focused on the frequency and severity of concerns over eating, shape, and weight; body checking behaviours; and anxiety about weight gain and changes in body shape (A copy of the
May, 2009 press release is provided in Appendix M). In response to media interest from the two press releases, the project was advertised on radio and television, and in the print media.

**Radio and television sources.** Following the first press release, the primary researcher participated in two pre-recorded radio interviews, which were subsequently aired on news bulletins for three radio stations within Australia (ABC National, B105, and Triple M). The second press release generated widespread attention from radio stations and television networks. Fifteen pre-recorded and five live radio interviews were conducted across Victoria, New South Wales, the ACT, Queensland, and South Australia. Pre-recorded interviews focused predominantly on preliminary findings pertaining to the proportion of women who maintained concerns over body shape and weight. Underlying causes and potential influences on the development and maintenance of these concerns were discussed, in addition to possible preventative measures and services available to women in the community who had similar concerns. Information was also provided regarding the research website, participation in the study, and contact details for the primary researcher. Several radio stations opted to discuss the preliminary findings with their listeners in the absence of an interview with the primary researcher (e.g., Fox FM). On most occasions, information was provided as to the process of participating in the research.

Preliminary findings from the research were also discussed on a nation-wide television program (The Morning Show). Hosts of the program conducted a short debate regarding the frequency of concerns about weight, whether these concerns are limited to women, and variations in concerns about weight throughout the lifespan.

**Print media.** Following the first press release, several newspapers in metropolitan Melbourne (e.g., The Australian, MX) published information regarding the project, and invited women in the community to participate. Brief articles were also published in several rural newspapers (e.g., Mildura Midweek) and on online
publications (e.g., Medical Search Australia and New Zealand, Australian Women Online).

As was the case with radio and television exposure, the second press release generated a greater response from the print media. Articles presenting preliminary findings were reported in several major newspapers within Metropolitan Melbourne (e.g., The Herald Sun, The Age, The Australian). Articles generally reported that recruitment for the study was ongoing, with a link to the online questionnaire being provided.

Recruitment of the clinical sample. Directors of eating disorder clinics in and around metropolitan Melbourne were contacted by phone to discuss the possibility of recruiting patients from their centre to participate in the current research. Following this, an appointment was made for the primary researcher to meet with the director to outline details of the project and possible involvement of the centre. Directors were informed that participation would involve completion of a single questionnaire package, that any identifying information would not be required, and that all costs incurred would be accounted for by the existing research budget allocated by RMIT University. Out of the six clinics that were initially contacted, three opted to assist with recruitment. These included The Bronte Centre at St Vincent’s, The Oak House, and Recovery is Possible (RIPE). Due to The Bronte Centre being an eating disorders clinic affiliated with St Vincent’s Hospital, ethics approval was required from St Vincent’s Health Human Research Ethics Committee – A. Recruitment at this site did not commence prior to ethics approval being granted by the committee.

The Bronte Centre at St Vincent’s and The Oak House chose to set up a drop box in the waiting room of their clinic. Flyers, Plain Language Statements (Refer to Appendix N for a copy of the Plain Language Statement for the clinical sample), and questionnaire packages were provided to each centre, along with information for clinicians to brief patients about the nature of the study. All participants were informed
that participation in the study was voluntary, that their decision to participate would not influence their treatment in any way, and that they were permitted to withdraw from the study at any time. Participants recruited from these venues had the option of completing the questionnaire package either online or via a hardcopy version. Participants who completed the hardcopy version returned completed questionnaires to either the drop box within the centre or via a supplied reply paid envelope. Of note, the majority of participants recruited for the clinical sample chose to complete a hardcopy questionnaire as opposed to participating online.

**Participation in the study.** Participants who chose to complete a hardcopy questionnaire were each provided with an information package containing a Plain Language Statement, questionnaire booklet, and a reply paid envelope. These documents outlined the purpose and nature of the study and that only females aged 18 years or older were eligible to participate. Participants were also informed that participation was voluntary, that all information provided would remain confidential, and that they had the right to withdraw at any time. The Plain Language Statement outlined that written informed consent was not required, and that informed consent was implied on the basis of the participant completing and returning the questionnaire. Participants were not asked to place any identifying information on the questionnaire package. This process ensured voluntary participation and complete anonymity for participants. Questionnaires were completed during the participants’ own time and required approximately 30 minutes to complete.

As stated previously, participants could access the online questionnaire by visiting the study webpage. Prior to gaining access to commence the online questionnaire, participants were asked to read a series of statements with corresponding tick boxes (Refer to Appendix O for a list of these statements). These statements outlined that the participant had read the Plain Language Statement, understood that information gathered would be for the purposes of research, and that
information provided would remain private and confidential unless the researchers were obligated by law or permitted to disclose information by the participant. Participants were also required to acknowledge an understanding that they had the right to withdraw from the study until their questionnaire was submitted, following which time it would not be possible to identify and remove their data from the study. The online questionnaire also required approximately 30 minutes to complete.

**Process After Participation.** Following submission of the online questionnaire, data was automatically uploaded onto the SurveyMonkey website. Hardcopy questionnaires were placed in a drop box located within local clinics and community centres or returned in the provided reply paid envelope. On the last page of both the hardcopy and online questionnaire packages, a list of support services was provided with corresponding contact details. Services available in regards to eating or anxiety disorders in each Australian state and territory was detailed, in association with 24-hour national counselling services such as Life Line and Beyond Blue. Participants were encouraged to discuss their concerns if they were feeling uncomfortable, anxious, or distressed in any way. In the event that a participant felt discomfort arising from participation in the research, they were advised to contact either Dr David Smith or Dr Susan Paxton as soon as convenient. These resources provided participants with the opportunity to contact either a male or female healthcare professional. Dr Smith or Dr Paxton were available to discuss the participant’s concerns confidentially and arrange appropriate follow-up, if necessary.

In regards to the management and security of information, only the primary researcher had access to the data stored on the SurveyMonkey server. A copy of this data was also stored on a password protected USB Flash drive. Only the primary researcher and supervisors had access to the electronic data on this drive. All hardcopy questionnaires were stored in a locked filing cabinet at the RMIT University Bundoora West Campus. All questionnaires completed at clinics and community
centres such as The Bronte Centre at St Vincent’s and The Oak House were kept in a locked drop box, under the supervision of the clinic director. Following completion of the recruitment phase, the questionnaires were transferred by the primary researcher to the locked filing cabinet at the RMIT University Bundoora West Campus.
Chapter 6
Data Preparation, Screening, and Categorisation of Participants to Groups

As each of the four studies in this research used the same sample, data preparation, screening, and group categorisation procedures reported in this chapter apply to all studies. The data set was screened and cleaned at a holistic level, in order to ensure the validity and consistency of the results presented in all four studies. All data analyses were conducted using the Statistical Package for the Social Sciences (SPSS), Version 17.0.

Missing Value Analysis

Two-hundred and fourteen participants discontinued the online questionnaire following completion of the demographics section. These cases were deleted from the data file. The EDE-Q was the first psychometric questionnaire within the questionnaire package and thus, participants were required to have answered the demographics questions and the EDE-Q at a minimum to be retained in the research sample. Case deletion was implemented for participants who had discontinued prior to completing the EDE-Q. Two-hundred and eighteen participants completed the demographics and EDE-Q sections of the package, but discontinued at a later stage of the questionnaire. For these participants, only scores on the completed measures were utilised, hence the variation in sample size within the analyses for the different measures.

The second phase of evaluating missing data was conducted using the Missing Value Analysis (MVA) function in SPSS, a procedure that examines the quantity and distribution of missing data (Tabachnick & Fidell, 2001). Less than 5% of the sample had missing data, which was found to be randomly distributed within the data file. The Expectation Maximisation (EM) method was utilised to replace missing values, as this is a recommended procedure when missing data are randomly distributed (Tabachnick & Fidell, 2001). The EM method is a preferred approach for the imputation of missing data as it avoids over-fitting the data, that is, changing the solution so that it is
improved or enhanced when compared with how the solution presented in reality. The EM approach also provides realistic estimations of variance in the data, and thus missing data values are replaced with data that adequately represent the level of variability in the data set. The EM method is preferred to alternate approaches such as mean substitution, and is considered the “simplest and most reasonable approach to imputation of missing data” (p. 66), provided missing data are distributed randomly (Tabachnick & Fidell, 2001). Another strength of the EM approach is that it does not compromise the efficacy of data analytic procedures such as factor analysis and regression (SPSS, 2009), two procedures that will be incorporated in forthcoming analyses. All missing data points were evaluated and replaced prior to commencement of data analysis.

Assumption Testing

Exploratory data analysis was conducted on all variables to ensure that statistical assumptions underlying the parametric procedures to be conducted were met. This incorporated examination of stem-and-leaf and normality plots, as well as statistical analysis of skewness and kurtosis. Analyses revealed that there were no major violations in the normality and linearity assumptions that would impinge on the validity of the data analytic procedures. However, several violations in the homogeneity of variance assumption were found. This is expected based on the comparison of clinical and non-clinical groups on measures of clinical symptomatology. Non-parametric data analytic procedures were utilised when data transformations (e.g., log, reciprocal) did not correct this violation.

Significance Testing and Effect Size Estimates

Providing parametric assumptions were met, group-based analyses were based on a series of t-tests, Analysis of Variance (ANOVA), and Multivariate Analysis of Variance (MANOVA) techniques. On occasions where there was a violation in the homogeneity of variance assumption, data transformations were conducted to correct
the violation. If a marked violation in the assumption remained, a non-parametric procedure was employed. Analyses containing two groups were analysed using the Mann-Whitney U test, whilst those containing more than two groups were analysed using the Kruskal-Wallis test. The Kruskal-Wallis test is a nonparametric procedure that is considered an appropriate nonparametric substitute for ANOVA when normality or homogeneity of variance assumptions have been violated (Tabachnick & Fidell, 2001). When using the Kruskal-Wallis procedure, post-hoc testing was conducted using a series of Mann-Whitney U tests with Bonferroni adjusted alpha levels. Bonferroni adjustments were utilised to account for the likelihood of a Type I error, that is, the risk of rejecting the null hypothesis when the null hypothesis is actually true. This adjustment is a safeguard against chance error and states that if conducting $n$ comparisons, then the resultant significance level should be $\alpha/n$, or in the case of the current research, .05/$n$ (Tabachnick & Fidell, 2001).

To complement analyses based on significance testing, effect sizes were computed where possible. It is well established that examination of point and interval estimates of effect size are preferred to reporting a $p$-value in isolation, particularly when working with small samples (Cohen, 1988; Newcombe, 2006a, 2006b). Whilst sufficiently large to conduct significance tests, sample sizes of groups incorporated in the current research had the potential to confound results if findings were based on examination of significance testing alone. As such, effect size estimates were incorporated into all group-based parametric and non-parametric analyses.

Parametric effect size estimates consisted of Cohen's $d$ for two-sample tests (e.g., $t$-tests), and partial $\eta^2$ for analyses incorporating ANOVA and MANOVA. The magnitude of each Cohen's $d$ effect size was evaluated using guidelines provided by Cohen (1988), whereby, 0.2 = small, 0.6 = moderate, 1.2 = large, and 2.0 = very large. Cohen (1988) also provides guidelines for interpreting partial $\eta^2$, whereby, .01 = small, ...
.06 = medium, and .15 = large. Ninety-five percent confidence intervals were computed around each Cohen’s $d$ and partial $\eta^2$ effect size.

The effect size estimate utilised for two-sample non-parametric post-hoc testing was $\theta$, given by:

$$\theta = \frac{\text{Mann-Whitney U statistic}}{(m)(n)}$$

In this measure of effect size, $m$ is the sample size of group 1 and $n$ is the sample size of group 2. This effect size does not require parametric assumptions to be met, and can be employed to analyse both continuous and ordinal data (Newcombe, 2006a, 2006b). Values of $\theta$ range from zero to one, with scores of zero or one indicating no overlap between the rankings of the two groups, thus suggesting a maximum effect size. A $\theta$ of .5 indicates maximum overlap between the rankings of each group, thus indicating no difference between the groups. The greater the departure from .5, the greater the effect size. Several authors have adopted cut-off scores to aid in the interpretation of effect size $\theta$. According to Colditz, Miller, and Mosteller (1988), effect sizes of .44 may be regarded as small, .36 regarded as medium, and .29 regarded as large, refer to Figure 3.

![Figure 3. Example of a figure that will be used to display effect size estimates for non-parametric group-based comparisons.](image-url)
These guidelines have been incorporated into studies utilising the Mann-Whitney procedure with corresponding effect size estimates, and were incorporated into the current analyses for this purpose. Ninety-five percent confidence intervals were computed around the non-parametric effect size estimate using the procedures proposed by Newcombe (2006a, 2006b).
**Categorisation of Participants to Groups**

Participants were categorised into Eating Disorder, OCD, Depression, and Community Control groups based on their self-reported diagnostic history and clinical cut-offs on psychometric measures. In this section, a summary of the diagnostic and treatment history reported by participants is provided, followed by a description of the criteria used to categorise participants into each group.

**Diagnostic history.** Thirty-two percent \((n = 386)\) of participants reported at least one clinical diagnosis during their lifetime, whilst 15.0% reported being diagnosed with two or more conditions. Figure 4 provides a summary of the self-reported diagnoses reported by participants.

![Figure 4. Number of participants that reported a diagnosis of a DSM-IV-TR disorder. AN: Anorexia Nervosa, BN: Bulimia Nervosa, EDNOS: Eating Disorder Not Otherwise Specified, OCD: Obsessive-Compulsive Disorder, D: Depression, AD: Other Anxiety Disorder, OAI: Other Axis I Disorder, OAll: Other Axis II Disorder.](image)

Depression was the most frequently reported diagnosis by participants (23.1%, \(n = 279\)), followed by an anxiety disorder other than OCD (9.2%, \(n = 111\)). AN was the most common eating disorder reported, with 7.2% \((n = 87)\) of participants reporting a
history of this disorder. By comparison, 3.2% (n = 39) reported a history of BN, 0.9% (n = 11) reported a history of EDNOS, and 1.2% (n = 15) reported a history of an unspecified eating disorder, that is, they did not specify whether the disorder was AN, BN, or EDNOS. Less than 2.0% (n = 21) of the sample reported a history of OCD, indicating that women with OCD were underrepresented in the current sample when compared with population estimates of 2.5% of the adult population (American Psychiatric Association, 2000; Gibbs, 1996; Weissman et al., 1994). A small proportion of the sample, 3.6% (n = 43) and 0.9% (n = 11) respectively, reported a history of another Axis I (e.g., Adjustment Disorder) or Axis II (e.g., Borderline Personality Disorder) DSM-IV-TR disorder.

Figure 5 displays a summary of self-reported eating disorder comorbidities and eating disorders in isolation for the current sample.

*Figure 5. Number of participants reporting a comorbid diagnosis of various DSM-IV-TR disorders. AN: Anorexia Nervosa, BN: Bulimia Nervosa, EDNOS: Eating Disorder Not Otherwise Specified, OCD: Obsessive-Compulsive Disorder, D: Depression, AD: Other Anxiety Disorder.*
A history of both AN and BN was the most commonly reported eating disorder comorbidity, followed by AN and EDNOS. AN, BN, and EDNOS all had strong comorbidity rates with depression, with the majority of participants reporting a history of BN or EDNOS also reporting a history of Major Depression. It should be noted that OCD was most frequently comorbid with AN when compared with BN. There were no reported cases of EDNOS with comorbid OCD in the current sample.

**Self-reported treatment history.** Following three months of recruitment, preliminary data analysis of the data indicated a higher than expected history of mental illness. To obtain a measure of professional input for these conditions with regards to consultation with a healthcare professional and participation in treatment, it was decided that participants be asked whether they had sought treatment for a psychological condition in the past. Participants were also asked whom assistance had been sought from, when assistance was first sought, how recently assistance had been sought, and how many sessions were attended. Due to the delay in including these items in the questionnaire, only 778 of the 1207 participants had an opportunity to respond to this series of questions.

Of those women who did respond, 30.6% \((n = 369)\) of participants reported that they had sought help from a healthcare professional for a psychological issue in the past. Of these, 29.2% \((n = 104)\) had sought help from a General Practitioner (GP), 38.2% \((n = 136)\) from a psychologist, 15.2% \((n = 54)\) from a psychiatrist, 16.3% \((n = 58)\) from a counsellor, and 0.8% \((n = 3)\) from another type of healthcare professional (e.g., social worker).

The spread of when participants first sought assistance was normally distributed, with 6.0% \((n = 22)\) seeking help prior to 1990, 29.7% \((n = 109)\) between 1991 and 2000, 47.1% \((n = 173)\) between 2001 and 2007, and 17.2% \((n = 63)\) between 2008 and 2009. Only 11.7% \((n = 43)\) of participants who had sought assistance in the past had not sought help since prior to 2000.
Regarding the length of treatment, 10.7% \((n = 39)\) of women who had sought help from a healthcare professional in the past attended only one appointment. The majority of participants, 51.9% \((n = 190)\), attended between two and 10 appointments, whilst 18.3% \((n = 67)\) and 10.7% \((n = 39)\) attended between 11 and 20 or between 21 and 50 appointments respectively. Nine percent \((n = 31)\) of women who had sought help had attended more than 50 appointments to date for assistance with their mental health condition.

**Criteria used to categorise the eating disorder group.** Participants clustered into the eating disorder group reported a diagnostic history of at least one of AN, BN, EDNOS, or an unspecified eating disorder. In addition, the participant’s score on the EDE-Q was required to be in the clinical range, that is, a global EDE-Q average item score that was greater than 2.3. Fairburn and Beglin (1994) initially recommended that a global average item score of 4.0 or above was an appropriate clinical cut-off for the EDE-Q. However, recent studies have determined that average item scores greater than 2.3 are indicative of eating pathology and more clearly represent a clinical eating disorder cut-off (Mond et al., 2004b; Mountford et al., 2006). In the current research, only participants who reported a diagnostic history of an eating disorder yet maintained a global EDE-Q item average score above 2.3 were categorised into the eating disorder group. It should be noted that 79.0% of participants in the eating disorder group had a global EDE-Q score that was greater than 4.0, with EDE-Q global scores for the remaining 21% falling between 2.3 and 4.0.

Within the eating disorder group, participants were clustered into diagnostic categories for analyses that warranted examination of differences among the types of eating disorders. Participants were clustered into an AN, BN, EDNOS, or unspecified eating disorder (Unspecified ED) group on the basis of their self-reported diagnostic history and current symptomatology on the EDE-Q. Symptomatology utilised to categorise participants was based on past research that has employed similar
methodology to cluster participants (Mond et al., 2004b; Mountford et al., 2006; Shafran et al., 2007), as well as incorporating the DSM-IV-TR diagnostic criteria for each disorder (American Psychiatric Association, 2000).

Participants were categorised into the AN group if they had been diagnosed with AN in the past, and had a current BMI of less than 18.5. Participants were categorised into the BN group if they reported a diagnostic history of BN, had a BMI that was greater than 18.5, and reported at least eight OBE’s over the past four weeks (i.e., averaging two per week over the past month). Participants were categorised into the EDNOS group if they reported a diagnostic history of EDNOS in the absence of any other eating disorder diagnosis. Those participants who reported being diagnosed with an eating disorder but did not specify a particular type of disorder were categorised into the unspecified eating disorder group. As mentioned, all participants categorised into one of the eating disorder groups had global scores on the EDE-Q that were greater than 2.3, with the majority exceeding 4.0.

Based on the additional symptom criteria, not all participants reporting a diagnosis of an eating disorder were able to be classified into a single eating disorder category. For example, several participants reported a diagnosis of AN, however had a current BMI above 18.5, which precluded their inclusion in the AN group. Sixty-seven participants from the overall eating disorder group were able to be classified into a specific eating disorder category.

Table 2 displays a summary of scores on the EDE-Q for participants in the eating disorder groups. Significance tests were not considered for the EDE-Q given that cut-off scores were used to categorise participants into eating disorder categories, resulting in largely similar EDE-Q scores across the eating disorder diagnostic groups. In regards to eating disorder behaviours, chi-square analyses were used to determine whether there were any significant differences in the frequency of certain behaviours across eating disorder diagnostic categories. No significant differences emerged with
respect to extreme dietary restraint, $\chi^2 (3, N = 67) = 2.34, p = .51$, SBEs, $\chi^2 (3, N = 67) = 7.02, p = .07$, self-induced vomiting, $\chi^2 (3, N = 67) = 4.19, p = .24$, laxatives use, $\chi^2 (3, N = 67) = 6.02, p = .11$, or diuretic use, $\chi^2 (3, N = 67) = 2.92, p = .40$. However, a significant difference in OBEs was found across the eating disorder diagnostic groups, $\chi^2 (3, N = 67) = 24.53, p < .001$. Follow-up analysis of the standardised residuals indicated that participants reporting OBEs were overrepresented for the BN group and underrepresented for the AN group. This finding is not surprising given that women had to report at least four OBEs over the past month in order to be categorised into the BN group.
Table 2

Mean and Standard Deviation Scores on the EDE-Q and Frequency of Disordered Eating Behaviour for Participants in Each Eating Disorder Diagnostic Category

<table>
<thead>
<tr>
<th>Subscale</th>
<th>AN</th>
<th>BN</th>
<th>EDNOS</th>
<th>Unspecified ED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>N</td>
<td>31</td>
<td>17</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>EDE-Q</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restraint</td>
<td>4.94 (1.42)</td>
<td>4.84 (0.90)</td>
<td>4.09 (1.24)</td>
<td>4.66 (1.41)</td>
</tr>
<tr>
<td>Weight Concern</td>
<td>4.91 (0.97)</td>
<td>4.99 (0.76)</td>
<td>4.51 (0.95)</td>
<td>5.22 (1.00)</td>
</tr>
<tr>
<td>Shape Concern</td>
<td>5.25 (0.91)</td>
<td>5.46 (0.59)</td>
<td>4.83 (0.98)</td>
<td>5.60 (0.77)</td>
</tr>
<tr>
<td>Eating Concern</td>
<td>4.33 (1.19)</td>
<td>4.24 (0.99)</td>
<td>3.82 (0.90)</td>
<td>4.78 (1.47)</td>
</tr>
<tr>
<td>Global score</td>
<td>5.07 (0.94)</td>
<td>5.15 (0.55)</td>
<td>4.54 (0.92)</td>
<td>5.24 (0.90)</td>
</tr>
<tr>
<td>EDE-Q Behaviour</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extreme restraint</td>
<td>71.0</td>
<td>52.9</td>
<td>77.8</td>
<td>60.0</td>
</tr>
<tr>
<td>OBE</td>
<td>25.8</td>
<td>100.0</td>
<td>55.6</td>
<td>60.0</td>
</tr>
<tr>
<td>SBE</td>
<td>90.3</td>
<td>64.7</td>
<td>100.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Self-induced vomiting</td>
<td>41.9</td>
<td>64.7</td>
<td>66.7</td>
<td>70.0</td>
</tr>
<tr>
<td>Laxative use</td>
<td>48.4</td>
<td>17.6</td>
<td>44.4</td>
<td>60.0</td>
</tr>
<tr>
<td>Diuretic use</td>
<td>12.9</td>
<td>5.9</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Criteria used to categorise the Obsessive-Compulsive Disorder (OCD) group. Participants in the OCD group were clustered on the basis of a self-reported diagnostic history of OCD in addition to a total score on the OCI-R greater than or equal to 20 as well as a score on the Obsession subscale of greater than or equal to four. Examination of the OCI-R by Foa and colleagues (2002) using ROC analysis indicated that these cut-off scores provided the greatest sensitivity and specificity in discriminating between individuals with and without OCD. Similar analyses were conducted by Abramowitz and Deacon (2006), who asserted that the OCI-R total score maintains “excellent discriminatory power” (p. 1030) in predicting an OCD diagnosis.

Criteria used to categorise the Depression group. Participants were categorised in the depression group if they reported a diagnostic history of depression and a score on the Depression subscale of the DASS of greater than 12. Clinical studies utilising the long and short forms of the DASS among clinical outpatients (Antony et al., 1998) and depressed individuals at the time of a hospital admission (Page, Hooke, & Morrison, 2007) indicate clinical cut-off scores ranging between 12.00 and 15.00 are appropriate. Whilst the DASS is not a diagnostic measure, this measure correlates strongly (.74 to .79; Antony et al., 1998; Lovibond & Lovibond, 1995) with the BDI, a measure that is commonly employed to provide convergent evidence for a clinical diagnosis. Only participants with a self-reported diagnostic history of depression were considered for inclusion in this group.

Criteria used to categorise the Community Control group. Although control groups are frequently incorporated in intervention-based research, studies comparing symptoms in a clinical population often recruit a sample of participants who are not expected to exhibit such symptoms (e.g., Bastiani et al., 1995; Lavender et al., 2006; OCCWG, 2005). These participants represent a control in the sense that they do not exhibit the characteristics typical of the clinical comparison group. Community comparison groups who do not score highly on clinical symptoms are often described
as the non-clinical group, community control group, healthy controls, or as non-cases (e.g., Bastiani et al., 1995; Lavender et al., 2006; Mond et al., 2004b; OCCWG, 2005). Whilst these titles are used interchangeably in clinical research, this cluster of participants is described as the Community Control group in the current research. Such an approach has been adopted in research conducted by the OCCWG (2005) as well as studies in the area of eating disorders (Bastiani et al., 1995; Lavender et al., 2006; Mond et al., 2004b). In the current research, participants categorised in the Community Control group represented those participants with no self-reported diagnostic history and scores on the EDE-Q, and the Depression and Anxiety subscales of the DASS within the normal range.

Given that the primary focus of this research was on a population of women with eating disorders, only eating disorder symptomatology and scores on general measures of psychopathology (depression and anxiety) were used to categorise participants into community control groups. This methodology enabled comparisons between a clinical eating disorder sample, a clinical sample of women with OCD, and a community sample on scores of OCD when eating disorder symptoms and general mood and anxiety symptomatology were accounted for. If participants in the community control group were also required to have levels of OCD symptomatology that were within the normal range, these participants would have been likely to differ significantly on scores of OCD symptoms, general obsessive beliefs, and obsessive beliefs in the domains of eating, shape and weight on the basis of this categorisation process alone. By controlling for eating disorder symptoms and general mood and anxiety (but not OCD symptoms), it was possible to compare scores on OCD and obsessive beliefs across women with OCD, women with an eating disorder, and women in the community who do not currently present with subclinical or clinical symptoms of eating disorders, general mood disturbance or general anxiety.
It should be noted that a proportion of participants did not report a diagnostic history of an eating disorder yet maintained scores on the EDE-Q within the clinical range. To accommodate for this without confounding the Community Control group, a Subclinical Community Control group and a Clinical Community Control group were established. Participants in the Subclinical Community Control group represent participants with no diagnostic history, scores of depression and anxiety in the normal range and scores on the EDE-Q between 2.3 and 4.0. Participants with no self-reported diagnostic history, depression and anxiety scores within the normal range, and scores on the EDE-Q that exceeded 4.0 were categorised in the Clinical Community Control group. These two groups were utilised in a small number of analyses.

Given the criteria used to categorise participants to groups, not all participants in the total sample of 1207 were allocated to a group. In total, 973 participants were allocated to a group, with the remaining 234 only being incorporated in analyses that utilised the entire sample (e.g., correlational analysis, regression analysis etc). This methodology was implemented given that not all participants met criteria to be designated to a group. For example, if a participant had no diagnostic history of an eating disorder, yet had clinical scores on the EDE-Q and scores in the normal range on depression and anxiety, they would be categorised into the Clinical Community Control group. However, if a participant had no diagnostic history of an eating disorder, had clinical scores on the EDE-Q and also scores in clinical range on the depression subscale of the DASS, they would not be classified as a community control given their clinical symptoms, nor would they be categorised in either of the eating disorder or depression groups given that they do not have a diagnostic history of either of these disorders.

Categorisation of participants with a comorbid history of psychopathology. As highlighted in the participants section of the Method, a
proportion of participants reported a history of multiple DSM-IV-TR diagnostic conditions. In these cases, a hierarchical approach was employed based on the aims and research questions of the current research. If participants reported a history of an eating disorder and depression for example, they were clustered into the eating disorder group on the basis that comorbid depression is highly prevalent with AN, BN, and EDNOS (American Psychiatric Association, 2000). Furthermore, if a participant reported a history of OCD and depression or another type of anxiety disorder, they were clustered into the OCD group. This was based on the primary focus of the current research being on the overlap between eating disorders and OCD.

Demographic characteristics across the comparison groups. An analysis of the demographic characteristics of the comparison groups was carried out to determine homogeneous and heterogeneous aspects of the groups with regards to demographic factors. Table 3 presents a summary of the demographic characteristics of the comparison groups.
Table 3

Demographic Characteristics Comparison Across the Clinical and Non-Clinical Groups

<table>
<thead>
<tr>
<th></th>
<th>ED</th>
<th>OCD</th>
<th>DC</th>
<th>CC</th>
<th>Subclinical CC</th>
<th>Clinical CC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>n</td>
<td>100</td>
<td>21</td>
<td>48</td>
<td>365</td>
<td>252</td>
<td>187</td>
</tr>
<tr>
<td>Age</td>
<td>25.04 (7.18)</td>
<td>27.10 (9.80)</td>
<td>30.94 (10.64)</td>
<td>29.54 (9.72)</td>
<td>29.71 (10.68)</td>
<td>29.04 (10.93)</td>
</tr>
<tr>
<td>BMI</td>
<td>20.22 (4.39)</td>
<td>21.78 (5.28)</td>
<td>29.42 (9.48)</td>
<td>22.63 (4.18)</td>
<td>24.83 (5.73)</td>
<td>25.42 (5.89)</td>
</tr>
<tr>
<td>Living circumstances</td>
<td>% (n)</td>
<td>% (n)</td>
<td>% (n)</td>
<td>% (n)</td>
<td>% (n)</td>
<td>% (n)</td>
</tr>
<tr>
<td>Parents</td>
<td>42.0 (42)</td>
<td>47.6 (10)</td>
<td>24.5 (12)</td>
<td>22.9 (84)</td>
<td>31.5 (80)</td>
<td>26.7 (50)</td>
</tr>
<tr>
<td>Friends/roommates</td>
<td>20.0 (20)</td>
<td>14.3 (3)</td>
<td>24.5 (12)</td>
<td>19.3 (71)</td>
<td>17.3 (44)</td>
<td>18.7 (35)</td>
</tr>
<tr>
<td>Alone</td>
<td>19.0 (19)</td>
<td>19.0 (4.0)</td>
<td>16.3 (8)</td>
<td>13.4 (49)</td>
<td>9.1 (23)</td>
<td>9.6 (18)</td>
</tr>
<tr>
<td>Partner (not married)</td>
<td>11.0 (11)</td>
<td>0.0 (0)</td>
<td>14.3 (7)</td>
<td>20.4 (75)</td>
<td>20.1 (51)</td>
<td>22.5 (42)</td>
</tr>
<tr>
<td>Partner (married)</td>
<td>8.0 (8)</td>
<td>19.0 (4)</td>
<td>20.4 (10)</td>
<td>24.0 (88)</td>
<td>22.0 (56)</td>
<td>22.5 (42)</td>
</tr>
<tr>
<td>Currently studying</td>
<td>49.5 (48)</td>
<td>51.1 (12)</td>
<td>50.0 (23)</td>
<td>49.4 (178)</td>
<td>46.0 (115)</td>
<td>44.9 (83)</td>
</tr>
<tr>
<td>Completed education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-secondary school</td>
<td>8.5 (8)</td>
<td>10.0 (2)</td>
<td>10.6 (5)</td>
<td>1.4 (5)</td>
<td>2.0 (5)</td>
<td>6.1 (11)</td>
</tr>
<tr>
<td>Secondary school</td>
<td>38.3 (36)</td>
<td>45.0 (9)</td>
<td>36.2 (17)</td>
<td>27.2 (97)</td>
<td>32.0 (80)</td>
<td>34.1 (61)</td>
</tr>
<tr>
<td>TAFE course</td>
<td>12.8 (12)</td>
<td>10.0 (2)</td>
<td>14.9 (7)</td>
<td>8.1 (29)</td>
<td>10.8 (27)</td>
<td>15.1 (27)</td>
</tr>
<tr>
<td>Undergraduate degree</td>
<td>27.7 (26)</td>
<td>25.0 (5)</td>
<td>27.7 (13)</td>
<td>40.3 (144)</td>
<td>34.4 (86)</td>
<td>27.9 (50)</td>
</tr>
<tr>
<td>Postgraduate degree</td>
<td>12.8 (12)</td>
<td>10.0 (2)</td>
<td>10.6 (5)</td>
<td>22.7 (81)</td>
<td>20.8 (52)</td>
<td>16.2 (29)</td>
</tr>
</tbody>
</table>

Note. ED: Eating Disorder; OCD: Obsessive-Compulsive Disorder; DC: Depression; CC: Community Control; Subclinical CC: Subclinical Community Control; Clinical CC: Clinical Community Control.
A one-way between-subjects ANOVA was conducted to examine differences in age across the six groups. A significant overall effect was found, $F(5, 972) = 4.08, p = .001, \eta^2 = .021$. Follow-up Tukey post-hoc tests ($\alpha = .05$) revealed that participants in the eating disorder group were significantly younger than those in the depression ($p = .011$), community control ($p = .001$), subclinical community control ($p = .001$), and clinical community control ($p = .017$) groups. In the current sample, women with depression reported the highest average age, whilst the average participant age was highly comparable across the three community control groups.

Aside from participants with depression, mean BMI scores for all groups were found to be within the normal weight range, that is, between 18.5 and 25 kg/m$^2$. Despite this, there was variation across the groups, with a progressive increase in BMI being noted across the community control, subclinical community control, and clinical community control groups. Surprisingly, participants in the depression group reported an average BMI in the overweight (or borderline obese) range. A one-way between-subjects ANOVA was conducted to examine differences in BMI across the six groups. A significant overall effect was found, $F(5, 929) = 27.97, p < .001, \eta^2 = .13$. Follow-up Tukey post-hoc tests ($\alpha = .05$) revealed that participants in the eating disorder group had significantly lower BMI than those in the depression ($p < .001$), community control ($p = .002$), subclinical community control ($p < .001$), and clinical community control ($p < .001$) groups. Women with OCD also reported significantly lower BMI than their counterparts in the depression ($p < .001$) and clinical community control ($p = .048$) groups. Women in the depression group had significantly higher BMI than women in all other groups ($p < .001$ for all comparisons).

In regards to living arrangements, chi-square analysis revealed a significant difference in living arrangements across the six groups, $X^2 (20, N = 978) = 44.02, p = .001$. Follow-up examination of the standardised residuals revealed that a greater proportion of women with an eating disorder or OCD were living with their parents at
the time of the study. When compared with the other groups, women with OCD were more likely to be living alone, whilst only one participant with OCD was living with a partner. Participants with an eating disorder were less likely to be living with a partner (either married or de facto) when compared with the other groups, however this may be associated with the younger average age of women with an eating disorder in the current sample.

Chi-square analysis indicated that an equivalent number of participants in each group were studying at the time of the study, \( \chi^2 \) (5, \( N = 959 \)) = 2.29, \( p = .81 \). However, significant differences emerged across the groups in regards to level of completed education, \( \chi^2 \) (25, \( N = 947 \)) = 53.5, \( p = .001 \). Examination of the standardised residuals indicate that participants in the clinical groups (eating disorder, OCD, depression) were more likely to not have completed secondary school than participants in the non-clinical groups. In addition, fewer participants in the clinical groups had completed an undergraduate or postgraduate program when compared with the community controls groups.
Chapter 7
Study 1: The Association Between Eating Disorders and Obsessive-Compulsive Symptomatology

The aim of Study 1 was to examine the overlap between eating disorder and OCD symptomatology, with a focus on whether certain disordered eating behaviours were more or less related to subtypes of obsessions and compulsions. Associations between the number of disordered eating behaviours reported and the severity of OCD symptoms was also investigated. A discussion of the empirical literature and rationale for these aims is provided in detail in Chapter 3 and Chapter 4. Specific research questions that were addressed in this study include:

1. Are there differences in concerns over shape and weight, or in the type, frequency, and intensity of disordered eating behaviours engaged in by eating disorder, OCD, depression, and community control groups?
2. Does the strength of association between shape and weight concerns and OCD symptoms differ across subtypes of OCD?
3. Are there differences in OCD symptoms across eating disorder, OCD, depression, and community control groups?
4. Do symptoms of OCD differ across the eating disorder categories (AN, BN, EDNOS, and unspecified eating disorder)?
5. Are more complex or severe forms of disordered eating associated with greater OCD symptoms than less complex or severe forms of disordered eating?

Method

Please refer to the general Method section reported in Chapter 5 for a detailed summary of the sample of participants, measures, and procedures used in this study.
Results

Eating Disorder Symptom Comparison Across Clinical and Non-Clinical Groups

As a precursor to more complex analyses, the presence of eating disorder symptomatology was examined across the clinical and non-clinical comparison groups. The proportion of women from each clinical group who fell in the clinical range on the EDE-Q was first evaluated. As stated in the previous chapter, the literature has defined two clinical ranges for the EDE-Q. Fairburn and Beglin (1994) initially reported that an item average score of greater than 4.0 would constitute a clinical range for this measure. More recent studies have reported that a score greater than 2.3 constitutes a clinical range based on ROC analysis (Mond et al., 2004b). In the current study, all women with an eating disorder scored in the clinical range on the EDE-Q, with 79.0% having an average item Global EDE-Q score that exceeded 4.0. In regards to women with OCD, 71.4% had an average item Global EDE-Q that exceeded 2.3, whilst 23.8% obtained average item scores that exceeded 4.0. For the depression group, 85.7% had an average item Global EDE-Q score that exceeded 2.3, whilst 67.3% exceeded 4.0.

Group-based differences were also analysed, with average item scores on each EDE-Q subscale and the EDE-Q average item global score forming the dependent variables for analysis. Due to a violation in the homogeneity of variance assumption, differences across the four comparison groups were analysed using the Kruskal-Wallis Test. Post-hoc testing was conducted using a series of Mann-Whitney tests with Bonferroni adjusted alpha levels (α = .008), refer to Table 4.
Table 4

Mean and Standard Deviation Scores on the EDE-Q Across the Clinical and Community Control Groups

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ED (n = 100)</th>
<th>OCD (n = 21)</th>
<th>DC (n = 48)</th>
<th>CC (n = 365)</th>
<th>Entire sample (n = 1207)</th>
<th>Post-hoc comparisons (^1)</th>
<th>(H_{(df - 3)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restraint</td>
<td>4.42 (1.52)</td>
<td>3.02 (1.69)</td>
<td>2.96 (1.71)</td>
<td>0.90 (0.93)</td>
<td>2.35 (1.72)</td>
<td>247.82**</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>Weight Concern</td>
<td>4.83 (0.99)</td>
<td>3.05 (1.53)</td>
<td>4.42 (1.37)</td>
<td>1.02 (0.81)</td>
<td>2.90 (1.81)</td>
<td>319.41**</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>Shape Concern</td>
<td>5.18 (0.85)</td>
<td>3.53 (1.56)</td>
<td>4.82 (1.30)</td>
<td>1.29 (0.82)</td>
<td>3.28 (1.85)</td>
<td>326.62**</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Eating Concern</td>
<td>3.97 (1.38)</td>
<td>1.71 (1.59)</td>
<td>3.09 (1.83)</td>
<td>0.37 (0.49)</td>
<td>1.73 (1.67)</td>
<td>290.86**</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Global score</td>
<td>4.87 (0.95)</td>
<td>3.26 (1.45)</td>
<td>4.19 (1.27)</td>
<td>1.10 (0.67)</td>
<td>2.92 (1.67)</td>
<td>328.43**</td>
<td>1, 2, 4</td>
</tr>
</tbody>
</table>

Note. \(^1\) Sig. post-hoc comparisons: 1: ED>OCD, 2: ED>DC, 3: DC>OCD, 4: ED, OCD, DC>CC.

\(*p < .001.\)
Women with an eating disorder reported significantly higher scores on the EDE-Q global score when compared with all other groups, whilst women in the community control group reported significantly lower scores on the global EDE-Q score when compared with the clinical groups. Women with an eating disorder had significantly higher scores on all EDE subscales when compared with women with OCD, whilst women with depression demonstrated significantly higher scores on the Weight, Shape, and Eating Concern subscales of EDE-Q when compared with the OCD group.

Non-parametric effect size estimates ($\theta$) with corresponding 95% confidence intervals for each post-hoc comparison are displayed in Figure 6. On all EDE-Q subscales, large effect sizes emerged when comparing the eating disorder, OCD, or depression group with the community control group. It must be highlighted that utilising cut-off scores to cluster the community control group (e.g., participants must have maintained an EDE-Q global score of less than 2.3 to be included in this group) is likely to have amplified the level of effect. Large effect size differences were also found when comparing the eating disorder group with the OCD group on all EDE-Q subscales. With respect to comparing women with eating disorders and those with depression, a large effect size was only found for the Restraint subscale. Re-examination of the descriptive statistics in Table 4 validates this finding, with only mild differences being evident between these two groups.
Figure 6. Effect size for the Mann-Whitney U post-hoc test with corresponding 95% confidence interval error bars for the four comparison groups across the EDE-Q subscales and global score. The smaller the magnitude of effect size $\theta$, the larger the effect, with effect sizes of 0.5 indicating no effect and 0.0 indicating maximum effect.
Eating Disorder Behaviours Across Clinical and Non-Clinical Groups

To evaluate the prevalence of disordered eating behaviour among the comparison groups, an examination of behaviours measured on the EDE-Q was conducted. This was based on the investigation of eating disorder behaviours conducted by Wade and colleagues (2006a), and therefore measured the frequency of extreme dietary restraint, OBEs, SBEs, self-induced vomiting, laxative use, and diuretic use. The prevalence of each of these behaviours across the comparison groups is displayed Figure 7.
Figure 7. Percentage of participants in each comparison group currently engaging in each disordered eating behaviour. Note. EDR: Extreme Dietary Restraint.
As shown, women with an eating disorder engaged in disordered eating behaviours more frequently than non-eating disorder groups. Community controls who maintained scores on the EDE-Q within the clinical range demonstrated equivalent frequency of OBEs and SBEs when compared with women with an eating disorder. Participants in the depression group were engaging in a high frequency of disordered eating behaviour relative to the other non-eating disorder groups, with results indicating an overrepresentation with regards to engagement in OBEs and SBEs. A diagnosis of OCD was not associated with high or low frequency of disordered eating behaviour. Community controls demonstrated the lowest frequency of disordered eating behaviour for each behavioural category.

Based on the complexity and severity of the disordered eating condition, the number of participants who engaged in zero, one, or multiple eating disorder behaviours over the past month was assessed. Again, this analysis was conducted independently for each clinical and non-clinical group, refer to Figure 8.
Figure 8. Number of eating disorder behaviours engaged in by participants in each clinical and non-clinical group.
Approximately 80% of participants in the community control group had not engaged in any disordered eating behaviours over the past four weeks. This was in contrast to approximately 94% of participants with an eating disorder who had engaged in at least one behaviour, with participants in this group being equally likely to have engaged in one, two, three, or four behaviours. Participants with depression or those in the clinical community control group reported similar rates of disordered eating behaviour, and most frequently engaged in zero, one, or two behaviours. Participants with OCD were equally likely to engage in zero or one eating disorder behaviour, with only one participant with OCD reporting multiple disordered eating behaviours. Only a small minority of participants in the community control, subclinical community control, OCD, or depression groups reported greater than three disordered eating behaviours over the past month.

**Comparison between Eating Disorder and Obsessive-Compulsive Symptomatology**

In addressing the association between eating disorder and obsessive-compulsive symptomatology, a series of correlational and group-based analyses were conducted. Bivariate Pearson correlations were first computed. Table 5 displays a correlation matrix evaluating relationships between EDE-Q and OCI-R subscales and total scores for the entire sample.
Table 5

Correlation Matrix of Scores on the EDE-Q and the OCI-R for the Entire Sample

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (N = 1170)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Restraint</td>
<td>1</td>
<td>.69*</td>
<td>.69*</td>
<td>.71*</td>
<td>.83*</td>
<td>.26*</td>
<td>.28*</td>
<td>.33*</td>
<td>.37*</td>
<td>.26*</td>
<td>.32*</td>
<td>.40*</td>
</tr>
<tr>
<td>2. Weight Concern</td>
<td>1</td>
<td>.93*</td>
<td>.82*</td>
<td>.96*</td>
<td>.28*</td>
<td>.31*</td>
<td>.33*</td>
<td>.43*</td>
<td>.32*</td>
<td>.30*</td>
<td>.44*</td>
<td></td>
</tr>
<tr>
<td>3. Shape Concern</td>
<td>1</td>
<td>.82*</td>
<td>.97*</td>
<td>.28*</td>
<td>.32*</td>
<td>.34*</td>
<td>.43*</td>
<td>.33*</td>
<td>.30*</td>
<td>.44*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Eating Concern</td>
<td>1</td>
<td>.85*</td>
<td>.33*</td>
<td>.34*</td>
<td>.38*</td>
<td>.50*</td>
<td>.36*</td>
<td>.36*</td>
<td>.50*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. EDE-Q global</td>
<td>1</td>
<td>.29*</td>
<td>.33*</td>
<td>.36*</td>
<td>.45*</td>
<td>.33*</td>
<td>.33*</td>
<td>.46*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Washing</td>
<td>1</td>
<td>.50*</td>
<td>.57*</td>
<td>.46*</td>
<td>.35*</td>
<td>.58*</td>
<td>.73*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Checking</td>
<td>1</td>
<td>.57*</td>
<td>.47*</td>
<td>.53*</td>
<td>.53*</td>
<td>.79*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Ordering</td>
<td>1</td>
<td>.49*</td>
<td>.45*</td>
<td>.55*</td>
<td>.80*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Obsession</td>
<td>1</td>
<td>.51*</td>
<td>.51*</td>
<td>.77*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Hoarding</td>
<td>1</td>
<td>.42*</td>
<td>.73*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Mental Neut.</td>
<td>1</td>
<td>.76*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. OCI-R total</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. ** Correlation is significant at the .001 significance level (2-tailed).
All correlations were found to be significant at the $p < .001$ level. Correlations were in the expected directions, with increases in scores on the EDE-Q being positively associated with increases in scores on the OCI-R. The overall correlation between the EDE-Q global score and the OCI-R total score was moderate in strength. All EDE-Q subscales and the EDE-Q global score demonstrated their largest correlations with the Obsession subscale of the OCI-R ($r = .37$ to $.50$), when compared with the other OCI-R subscales. The Washing subscale of the OCI-R demonstrated the weakest association with the EDE-Q subscales and the EDE-Q global score ($r = .26$ to $.33$). All OCI-R subscales were most strongly related with the Eating Concern subscale of the EDE-Q ($r = .33$ to $.50$). Highly comparable associations were observed between the Weight and Shape concerns subscales of the EDE-Q and the OCI-R subscales.

The second phase of this analysis was to evaluate the proportion of women in each clinical group who fell in the clinical range on the OCI-R (OCI-R total $> 20$). All participants in the OCD group had an OCI-R total in the clinical range, given that this was a criterion used to categorise participants into this group (in addition to reporting a diagnostic history of OCD). In regards to women in the eating disorder or depression groups, 49.4% and 42.9% respectively obtained OCI-R total scores in the clinical range.

The third phase of this analysis was to compare subscale and total scores on the OCI-R across the clinical and community control groups. Power transformations could not correct a violation in the homogeneity of variance assumption and thus a non-parametric procedure was considered appropriate. The Kruskal-Wallis test was used to examine differences in subscale and total scores on the OCI-R. Post-hoc comparisons incorporated a series of Mann-Whitney tests with Bonferroni adjusted alpha levels ($\alpha = .008$).
Table 6

Mean and Standard Deviation Scores on the OCI-R Across the Clinical and Community Control Groups

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ED (n = 95)</th>
<th>OCD (n = 20)</th>
<th>DC (n = 48)</th>
<th>CC (n = 365)</th>
<th>Entire sample (n = 1170)</th>
<th>Post-hoc comparisons¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Washing</td>
<td>2.40 (3.00)</td>
<td>5.50 (4.42)</td>
<td>2.06 (2.97)</td>
<td>0.46 (1.16)</td>
<td>0.99 (2.06)</td>
<td>100.23**</td>
</tr>
<tr>
<td>Checking</td>
<td>3.20 (3.35)</td>
<td>6.05 (3.66)</td>
<td>3.63 (3.08)</td>
<td>0.97 (1.58)</td>
<td>1.82 (2.54)</td>
<td>120.61**</td>
</tr>
<tr>
<td>Ordering</td>
<td>4.93 (3.68)</td>
<td>7.20 (4.30)</td>
<td>3.94 (3.65)</td>
<td>1.43 (1.97)</td>
<td>2.48 (2.96)</td>
<td>122.36**</td>
</tr>
<tr>
<td>Obsession</td>
<td>5.34 (3.82)</td>
<td>7.35 (3.60)</td>
<td>5.67 (3.63)</td>
<td>0.73 (1.34)</td>
<td>2.20 (2.93)</td>
<td>250.05**</td>
</tr>
<tr>
<td>Hoarding</td>
<td>2.93 (2.95)</td>
<td>5.10 (4.59)</td>
<td>4.88 (3.67)</td>
<td>1.31 (1.69)</td>
<td>2.25 (2.63)</td>
<td>84.42**</td>
</tr>
<tr>
<td>Mental Neut.</td>
<td>2.69 (3.08)</td>
<td>5.20 (4.88)</td>
<td>1.55 (2.41)</td>
<td>0.32 (0.78)</td>
<td>0.91 (1.93)</td>
<td>120.10**</td>
</tr>
<tr>
<td>OCI-R total</td>
<td>21.49 (14.86)</td>
<td>36.50 (18.64)</td>
<td>21.74 (13.84)</td>
<td>10.82 (12.95)</td>
<td>10.65 (11.50)</td>
<td>208.76**</td>
</tr>
</tbody>
</table>

Note: ¹ Sig. post-hoc comparisons: 1: OCD>ED, 2: ED>DC, 3: OCD>DC, 4: ED, OCD, DC>CC, 5: DC>ED.

**p < .001.
Women with OCD had significantly higher scores than women with an eating disorder on the Washing and Checking subscales, and significantly higher scores than women with depression on Ordering and Mental Neutralisation. Participants with an eating disorder had significantly higher scores than women with depression on Ordering, whilst women with depression scored significantly higher than women with an eating disorder on Hoarding. All clinical groups scored significantly higher than community controls on all OCI-R subscales and the OCI-R total score.

Figure 9 displays effect size estimates with 95% confidence intervals for each post-hoc comparison with respect to the OCI-R subscales. Consistent with the significance test results, large effect size estimates were found when comparing participants with OCD with those with an eating disorder on the Washing and Checking subscales. Medium effect sizes were also found on the Ordering, Obsession, and Mental Neutralisation subscales when comparing these two groups. Small to medium effect sizes were found when comparing the eating disorder and depression groups on the Checking, Hoarding, and Mental Neutralisation subscales of the OCI-R. Large effect size estimates were found for all OCI-R subscales aside from Hoarding with respect to the eating disorder and community control group comparison. On the OCI-R total score (Figure 10), a large effect size was found when comparing the OCD group with the eating disorder and depression groups. Only a negligible effect size was found between the eating disorder and depression groups on the OCI-R total score.
Figure 9. Effect size for the Mann-Whitney U post-hoc test with corresponding 95% confidence interval error bars for the four comparison groups across the OCI-R subscales. The smaller the magnitude of effect size $\theta$, the larger the effect, with effect sizes of 0.5 indicating no effect and 0.0 indicating maximum effect.
Based on the finding that participants with an eating disorder demonstrated significantly higher scores and maintained large effect sizes on the OCI-R when compared with community controls, within group analysis of the eating disorder diagnostic categories was conducted. Table 7 displays mean and standard deviation scores on the OCI-R across the four eating disorder categories.

Table 7

<table>
<thead>
<tr>
<th>Subscale</th>
<th>AN (n = 31) M (SD)</th>
<th>BN (n = 17) M (SD)</th>
<th>EDNOS (n = 8) M (SD)</th>
<th>Unspecified ED (n = 10) M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing</td>
<td>2.81 (3.24)</td>
<td>1.59 (2.03)</td>
<td>2.00 (1.41)</td>
<td>2.64 (3.06)</td>
</tr>
<tr>
<td>Checking</td>
<td>4.06 (3.61)</td>
<td>3.00 (3.41)</td>
<td>3.00 (1.77)</td>
<td>4.10 (3.41)</td>
</tr>
<tr>
<td>Ordering</td>
<td>5.28 (3.97)</td>
<td>4.47 (3.69)</td>
<td>3.75 (2.71)</td>
<td>7.20 (3.65)</td>
</tr>
<tr>
<td>Obsession</td>
<td>5.42 (3.98)</td>
<td>5.59 (3.76)</td>
<td>4.25 (2.96)</td>
<td>6.56 (4.37)</td>
</tr>
<tr>
<td>Hoarding</td>
<td>3.26 (2.85)</td>
<td>3.76 (3.25)</td>
<td>3.38 (3.42)</td>
<td>3.60 (3.50)</td>
</tr>
<tr>
<td>Mental Neut.</td>
<td>3.81 (3.78)</td>
<td>1.82 (2.01)</td>
<td>2.63 (2.62)</td>
<td>3.30 (3.30)</td>
</tr>
<tr>
<td>OCI-R total</td>
<td>24.64 (16.65)</td>
<td>20.24 (13.26)</td>
<td>19.00 (12.96)</td>
<td>29.16 (17.77)</td>
</tr>
</tbody>
</table>

*Figure 10.* Effect size for the Mann-Whitney U post-hoc test with corresponding 95% confidence interval error bars for the four comparison groups for the OCI-R total score. The smaller the magnitude of effect size $\theta$, the larger the effect, with effect sizes of 0.5 indicating no effect and 0.0 indicating maximum effect.
The descriptive statistics in Table 7 indicate that women with AN reported higher OCI-R total scores when compared with women with BN or EDNOS. Women in the unspecified eating disorder group demonstrated the highest total score on the OCI-R, however it should be noted that the standard deviation for this group was equally high, indicating considerable variation in scores within this group. The small sample sizes in the EDNOS and unspecified eating disorder cells limited the power of group-based statistical analyses, and thus only participants in the AN and BN groups were compared. Data were analysed using independent samples t-tests with Bonferroni adjusted alpha levels ($\alpha = .007$). Effect size estimates were computed using Cohen’s $d$.

When compared with women with BN, women with AN reported significantly higher scores on the Mental Neutralisation subscale at the .05 level of significance, however this result was no longer significant after applying the Bonferroni adjusted alpha level, $t(45.99) = 2.01, p = .022, d = .61 (0.00, 1.21)$. No significant differences in scores were found between the AN and BN comparison groups on the remaining OCI-R subscales: Washing, $t(46) = 1.40, p = .17, d = .42 (-0.18, 1.02)$, Checking, $t(46) = 1.00, p = .33, d = .30 (-0.29, 0.89)$, Ordering, $t(46) = 0.69, p = .49, d = 0.21 (-0.39, 0.80)$, Obsession, $t(46) = -0.14, p = .89, d = 0.04 (-0.55, 0.63)$, Hoarding, $t(46) = -0.56, p = .58, d = 0.17 (-0.42, 0.76)$. Scores on the OCI-R total score did not differ significantly when comparing the AN and BN groups, $t(46) = 0.94, p = .35, d = 0.28 (-0.31, 0.88)$.

**Frequency of Eating Disorder Behaviours and Obsessive-Compulsive Symptoms**

Given that no significant results emerged when comparing eating disorder diagnostic groups on the OCI-R, all groups were collapsed to examine variation in obsessive-compulsive symptomatology with respect to the frequency of engagement in disordered eating behaviour. Scores on the OCI-R were compared across participants with a clinical eating disorder reporting occurrence of one, two, or three or more disordered eating behaviours over the past four weeks (refer to Table 8). Due to a
violation in the homogeneity of variance assumption, the Kruskal-Wallis test was used in this analysis. Post-hoc comparisons incorporated a series of Mann-Whitney tests with Bonferroni adjusted alpha levels ($\alpha = .008$).
Mean and Standard Deviation Scores on the OCI-R For Women with an Eating Disorder Reporting Zero, One, Two, or Three or More Eating Disorder Behaviours

<table>
<thead>
<tr>
<th>Subscale</th>
<th>0 (n = 605)</th>
<th>1 (n = 344)</th>
<th>2 (n = 115)</th>
<th>≥3 (n = 106)</th>
<th>$H_{(df = 3)}$</th>
<th>Post-hoc comparisons $^1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing</td>
<td>0.61 (1.50)</td>
<td>1.19 (2.33)</td>
<td>1.25 (2.17)</td>
<td>2.33 (2.94)</td>
<td>75.97**</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>Checking</td>
<td>1.19 (1.95)</td>
<td>2.03 (2.51)</td>
<td>2.93 (3.21)</td>
<td>3.54 (3.35)</td>
<td>105.20**</td>
<td>1, 4</td>
</tr>
<tr>
<td>Ordering</td>
<td>1.71 (2.35)</td>
<td>2.82 (3.00)</td>
<td>3.35 (3.31)</td>
<td>4.91 (3.73)</td>
<td>109.91**</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>Obsession</td>
<td>1.25 (2.03)</td>
<td>2.57 (3.01)</td>
<td>3.06 (3.23)</td>
<td>5.42 (3.78)</td>
<td>187.54**</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>Hoarding</td>
<td>1.63 (2.11)</td>
<td>2.55 (2.64)</td>
<td>3.00 (3.10)</td>
<td>3.96 (3.48)</td>
<td>75.93**</td>
<td>1, 4</td>
</tr>
<tr>
<td>Mental Neut.</td>
<td>0.44 (1.05)</td>
<td>1.05 (2.14)</td>
<td>1.48 (2.22)</td>
<td>2.49 (3.27)</td>
<td>93.33**</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>OCI-R total</td>
<td>6.84 (7.69)</td>
<td>12.21 (11.67)</td>
<td>14.99 (12.73)</td>
<td>22.65 (15.90)</td>
<td>185.73**</td>
<td>1, 2, 4</td>
</tr>
</tbody>
</table>

Note. $^1$ Sig. post-hoc comparisons: 1: [≥3EDBs] > 1EDB, 2: 3EDBs > 2EDBs, 3: 2EDBs > 1EDB, 4: 1EDB, 2EDBs, 3EDBs > 0EDBs. **$p < .001$. 
As shown, participation in one, two, or three or more EDBs was associated with significantly higher scores on all OCI-R subscales and the OCI-R total scores, when compared with women who did not participate in any EDBs over the past month. Aside from the Mental Neutralisation subscale, no significant differences in scores on the OCI-R were found when comparing those participants who had engaged in either one or two EDBs. Participants who engaged in three or more EDBs had significantly higher OCI-R scores across all subscales and the OCI-R total score when compared with women who engaged in one EDB. Women who engaged in three or more EDBs also had significantly higher scores on the Washing, Ordering, and Obsession subscales, and the OCI-R total score, when compared with women who engaged in two EDBs. As such, a marked increase in obsessive-compulsive symptomatology was evident for those women who participated in three or more EDBs, a finding that was consistent across the OCI-R subscales and total score. Effect size estimates for each post-hoc comparison are displayed in Figure 11 and Figure 12.
Figure 11. Effect size for the Mann-Whitney U post-hoc test with corresponding 95% confidence interval error bars for number of eating disorder behaviours across the OCI-R subscales. The smaller the magnitude of effect size $\theta$, the larger the effect, with effect sizes of 0.5 indicating no effect and 0.0 indicating maximum effect.
Small to medium effect sizes were found when evaluating scores on the OCI-R across participants who engaged in one or two EDBs. Medium to large effect sizes were found when comparing participants who had engaged in zero, one, or two EDBs with those who had engaged in three or more behaviours, with the largest effect sizes being for the Obsession and Ordering subscales respectively. An almost linear increase in effect size estimates was found when comparing participants who had engaged in zero, one, or two EDBs with those who had engaged in three or more behaviours. Of note, small effect sizes emerged when comparing participants who engaged in no EDBs with those who had engaged in one EDB with respect to scores on the OCI-R subscales. This effect was medium in strength with regards to the OCI-R total score.

**Discussion**

Researchers and practitioners alike have maintained longstanding views that a proportion of the core symptomatology underlying eating disorders overlap with those of OCD (Godart et al., 2000; Godart et al., 2002; Godart et al., 2006b; Shafran, 2002).
These contentions have been endorsed by research evidence (Godart et al., 2000; Halmi et al., 1991; Thiel et al., 1995; Thornton & Russell, 1997; Wagner et al., 2006), and findings of the current study provide further support for such links whilst highlighting several distinguishing factors.

**Eating Disorder Symptoms Across Clinical and Non-Clinical Groups**

In addressing the first research question, significant differences were found in disordered eating symptomatology across the eating disorder, OCD, depression, and community control groups. Participants with an eating disorder scored significantly higher on all subscales on the EDE-Q when compared with the OCD and community control groups, a finding that supports previous research (Fairburn & Beglin, 1994; Luce & Crowther, 1999; Mond et al., 2004b; Mond et al., 2006; Sysko et al., 2005). In the current study, women with an eating disorder reported mean EDE-Q subscale scores between 3.97 (Eating Concern) and 5.18 (Shape Concern). These are higher than those reported in an earlier Australian-based clinical study by Mond and colleagues (2004b), however, they more closely resemble scores reported by Shafran and colleagues (2004) in their examination of women with AN, BN, and EDNOS. Whilst this may indicate that the current sample had more acute eating pathology at the time of the study, it is also possible that inflated scores resulted from the use of self-report measures (as opposed to the interview form of the EDE), as studies have reported amplified scores on the EDE-Q when compared with the EDE (Fairburn & Beglin, 1994; Mond et al., 2004b). This may have been further compounded by utilising an online questionnaire for data collection, with some evidence that online questionnaires are associated with elevated scores on clinical measures (Buchanan, 2003). It is noteworthy, however, that the majority of participants in the eating disorder group were recruited from clinical centres using hardcopy questionnaires, which is likely to have reduced amplification of scores resulting from use of an online measure.
Participants in the community control group maintained EDE-Q scores in the realms of those reported in previous research on community samples (Fairburn & Beglin, 1994; Mond et al., 2006) and non-eating disorder cases (Mond et al., 2004b). Despite average BMI in the overweight to obese ranges, women with depression maintained higher EDE-Q scores with medium to large effect sizes when compared with women with OCD and community controls. It is well established that depression is associated with a negative view of self (Beck, 1995; Beck, Rush, Shaw, & Emery, 1987), with current findings suggesting that women with depression may fixate on aspects of body size, shape, and weight to the degree that concerns enter the clinical range. Given the high BMI reported by women with depression, high scores on the EDE-Q may also represent elevated body dissatisfaction when compared with women in the OCD and community control groups. Whilst depression has been reported as a primary comorbid condition with AN and BN (American Psychiatric Association, 2000; Hudson, Pope Jr., Jonas, & Yurgelun-Todd, 1983; Polivy & Herman, 2002; Stice, Haywood, Cameron, Killen, & Taylor, 2000), further research may examine whether depression, in and of itself, heightens the risk of eating pathology (Raffi, Rondini, Grandi, & Fava, 2000).

Scores on the EDE-Q also exceeded expectations among participants with OCD. Surprisingly, 23.8% of women in the OCD group obtained average item global scores that were clearly in the clinical range, that is, they exceeded 4.0. Although the EDE-Q is not diagnostic, this result is contrary to the findings of past research, which has reported that only 6% to 12% of OCD patients meet criteria for an eating disorder (Fahy et al., 1993; Kasvikis et al., 1986; Rubenstein et al., 1992). The level of concern indicated by women with OCD may suggest vulnerability towards developing an eating disorder, a notion that will be discussed in greater detail in the examination of obsessive beliefs. It should be noted, however, that the elevated concern over shape and weight, and engagement in dietary restraint reported by women with OCD in the
current sample may be a consequence of recruitment procedures in this research. Whilst participation was invited through anxiety disorder associations and clinics, the majority of targeted clinics and community centres had a focus on body image, dieting disorders, and disordered eating.

**Eating Disorder Behaviours Across Clinical and Non-Clinical Groups**

Examination of the severity and complexity of behaviours associated with eating disorders was carried out by cumulating the number of EDBs engaged in by participants over the preceding four weeks. This analysis follows from a framework adopted by Wade and colleagues (2006a), in their analysis of the number of Lifetime Eating Disorder Behaviours (LEDBs) among individuals with and without an eating disorder. Some similarity emerged between findings of the current study and those of Wade and colleagues, with participants without an eating disorder most likely to engage in zero or one disordered eating behaviour. Participants in the current study who had an eating disorder were equally likely to engage in one, two, three, or four EDBs, which differed from Wade and colleagues study since few patients with an eating disorder reported only one LEDB. Examination of these behaviours across the lifespan is likely to account for the higher frequency of eating disorder patients who reported engagement in more than one EDB in the research by Wade and colleagues.

Participants with OCD or depression were most likely to engage in one EDB, with few women with OCD participating in more than one EDB over the past month. More than half of the participants in the subclinical community control group engaged in zero EDBs, whilst almost half of the clinical community control group engaged in only one EDB. This finding further clarifies that community control participants in the clinical range on the EDE-Q are, for the most part, phenomenologically different to their eating disorder counterparts. In effect, although women in these groups obtained comparable scores on the Likert-based items within the EDE-Q, women with a diagnosed clinical
eating disorder engaged in substantially more EDBs than their community-based counterparts who score in the clinical range on this measure.

**Eating Disorder and Obsessive-Compulsive Symptomatology**

Phenomenological similarity between eating disorders and OCD has been documented for the past half century, with eating disorders being viewed as a compulsion neurosis or a contemporary expression of OCD (Du Bois, 1949; Rothernberg, 1986; Wu, 2008). A paucity of research has examined differences in eating disorder symptoms across subtypes of obsessions and compulsions (Thiel et al., 1995). Results of the current study indicated that higher scores on the Restraint, Eating, Shape, and Weight concerns subscales of the EDE-Q were associated with higher scores on all obsessive-compulsive symptom subtypes, including Washing, Checking, Ordering, Obsession, Hoarding, and Mental Neutralisation. Correlations were predominantly moderate in strength, with the highest correlations occurring between the EDE-Q subscales and the Obsession subscale of the OCI-R. Item content of this subscale sheds light on this relationship given that items relate to the presence of unpleasant thoughts (e.g., *Unpleasant thoughts come into my mind against my will and I cannot get rid of them*), difficulty controlling thoughts (e.g., *I find it difficult to control my own thoughts*), and difficulty eradicating distressing thoughts (e.g., *I frequency get nasty thoughts and have difficulty getting rid of them*). The lack of domain specificity leaves the items within this subscale open to interpretation by the respondent. For women who maintain concerns over eating, shape, and weight, unpleasant thoughts about body image are commonplace, with difficulty managing distressing thoughts in this domain being a core symptom experienced by women with eating pathology (Harnden et al., 1997; Meyer et al., 2000). Items within the Obsession subscale do not seek information about the consequence of distressing thoughts or methods of coping, and therefore whether the individual completes a checking,
cleaning, or counting ritual, or whether she weighs herself or engages in a body checking behaviour cannot be explained by this subscale alone.

When compared with the Obsession subscale, the Checking, Ordering, Hoarding, and Mental Neutralisation subscales of the OCI-R had correlations of slightly weaker magnitude with the EDE-Q, whilst the Washing subscale maintained the weakest associations. This is in contrast to findings of Humphreys and colleagues (2007), who reported that of all the OCI-R subscales, Washing and Checking maintained the strongest correlations with the EAT-26. One variation between the two studies is the use of the EAT-26 as opposed to the EDE-Q. In Humphreys and colleagues’ study, the correlation between the EAT-26 and the OCI-R total score was .29, when compared with the correlation of .46 found between the EDE-Q and the OCI-R in the current study. It is possible that items within the EDE-Q evaluate obsessional thoughts and compulsive or ritualistic behaviours more so than the EAT-26, or that the design of the EDE-Q as a self-report measure that is based on diagnostic criteria more closely aligns it with the quasi diagnostic items of the OCI-R. The nature of the samples also differed considerably across the two studies, and may account for the differences. Humphreys and colleagues’ study focused exclusively on female college students with a mean age of 19 years. By contrast, the current study recruited both a clinical and community sample with a substantially broader age range, and a subset of participants who had been diagnosed with an eating disorder, OCD, depression, or another Axis I or Axis II DSM-IV-TR disorder.

Group-based comparisons revealed that women with an eating disorder differed from those with OCD on the Washing and Checking subscales of the OCI-R, with no significant differences found for the other subscales. Whilst this might suggest that women with eating disorders and OCD have equivalent degrees of obsessive-compulsive symptoms, this conclusion misrepresents the data set. Examination of the descriptive statistics suggested that when compared with women with an eating
disorder, those with OCD have more severe obsessive-compulsive symptoms across all subscales, and this was supported by the medium to large effect size differences between these two groups. As such, it appears that the sample size of these two groups (100 and 21 respectively) may have restricted significant results being obtained for the other subscales, which further supports the use of effect size estimates.

Women with an eating disorder reported obsessive-compulsive symptoms that were significantly higher than community controls yet notably lower than women with OCD. This finding is consistent with previous research (Godart et al., 2003; Milos et al., 2002; Morgan et al., 2007), particularly Thiel and colleagues’ (1995) finding that women with either AN or BN maintain pathological doubt, fears of contamination, a need for symmetry, and general obsessions about religion, morality, and sexual content. Compulsions in the form of cleaning, checking, ordering, and counting have also been found to be common in this clinical population (Thiel et al., 1995). Whilst some symptoms reported by Thiel and colleagues may be accounted for by eating, shape, and weight concerns, a proportion fall into a general category of obsessive thoughts and ritualistic behaviour. This is consistent with results of the current study, with women with an eating disorder (with no history of OCD) reporting elevated scores on domains of OCD such as checking (e.g., I repeatedly check gas and water taps and light switches after turning them off), washing (e.g., I wash my hands more often and longer than necessary), ordering (e.g., I get upset if objects are not arranged properly), and hoarding (e.g., I have saved up so many things that they get in the way). Interpreting these scores as a function of eating pathology alone is difficult to justify, as these domains of obsessionality are not directly associated with eating, shape, and weight. It is more likely that a subset of women with eating disorders also maintain a need for symmetry and exactness that whilst present in the domain of body image, also intrude on other domains of the individual’s life (e.g., academic, vocational, or social).
Differences between the eating disorder and depression groups were inconsistent across the OCD subscales. Women with an eating disorder scored significantly higher than their depressed counterparts on the Ordering subscale, however women with depression reported significantly more obsessions and compulsions with respect to Hoarding. Scores on the other subscales were not significantly different, with effect size differences being negligible to low. Based on the similarity in scores on OCD symptomatology across the depression and eating disorder groups, it can be speculated that the relationship between eating disorders and OCD symptomatology may lie in their mutual association with depression or negative affect, a notion that has also been articulated by Tykra and colleagues (2002) and more recently by Humphreys and associates (2007).

Differences across the AN and BN groups also emerged on obsessive-compulsive subtypes of the OCI-R. Although not statistically significant, women with AN scored higher than their counterparts with BN on several subscales, with a moderate effect sizes found for the Mental Neutralisation subscale, and small effect sizes found for the Washing, Checking, and Ordering subscales. These findings are consistent with studies that have reported obsessions being more prominent among individuals with AN when compared with those with BN (Godart et al., 2006b), a conclusion that has been reached with Australian (Thornton & Russell, 1997) and international samples (Godart et al., 2003). Disparity on the Mental Neutralisation subscale indicates that women with AN adopt cognitive strategies to remove or suppress distressing or undesirable thoughts more frequently than their BN counterparts. Although women with BN engage in behavioural control strategies through self-induced vomiting or other compensatory behaviours, mental rituals such as reviewing mental events, counting, or repeating thoughts or numbers appear less common among this clinical population. It is plausible that women with AN adopt more stringent cognitive control strategies to assist in maintaining restrictive behaviours and
dietary restraint when compared with their BN counterparts. These strategies may provide a cognitive arsenal that compliments behavioural strategies such as excessive exercise, laxative and diuretic use, or self-induced vomiting.

**Statistical Overlap Between Eating Disorders and OCD**

Forty-six percent of women with an eating disorder scored in the clinical range on the OCI-R. Based on previous studies indicating that between 2% and 48% of individuals with eating disorders demonstrate clinical symptoms of OCD (Ben-Tovim et al., 1979; Braun et al., 1994; Halmi et al., 1991; Herzog et al., 1992; Thiel et al., 1995; Thornton & Russell, 1997), this finding places the current sample of women with an eating disorder toward the upper end of the spectrum. Research has estimated that the lifetime prevalence of OCD lies between 20% and 28.6% for individuals with AN (Halmi et al., 1991; Milos et al., 2002), and between 0% and 42.9% for individuals with BN (Brewerton et al., 1995; Fornari et al., 1992; Godart et al., 2000; Halmi et al., 1991; Hudson et al., 1987; Kaye et al., 2004; Laessle et al., 1989; Lilenfield et al., 1998; Milos et al., 2002; Powers et al., 1988; Schwalberg et al., 1992; Skodol et al., 1993; Thornton & Russell, 1997). In the present study, 55% and 41% of women with AN and BN respectively scored in the clinical range on the OCI-R. Although exceeding the lifetime prevalence rates reported in previous studies, the OCI-R is not a diagnostic measure and thus it is likely that a (potentially large) proportion of women in the clinical range for OCD would not go on to meet diagnostic criteria for this condition. It is also important to note that mean EDE-Q scores for women with an eating disorder in the current study exceeded those reported in earlier research, thus the heightened scores on a measure of obsessive-compulsive symptoms is consistent with scores in other clinical areas for the current sample.

**Frequency of Eating Disorder Behaviours and Obsessive-Compulsive Symptoms**

Potential links between the severity and complexity of eating pathology and the severity of obsessive-compulsive symptoms were analysed by comparing OCI-R
scores across participants who had engaged in zero, one, two, or three or more EDBs over the past month. EDBs incorporated extreme dietary restraint, OBEs, SBEs, self-induced vomiting, laxative use, and diuretic use. A linear increase in the severity of obsessive-compulsive symptoms was found when comparing groups who had engaged in zero through to three or more EDBs, with Ordering and Obsession maintaining the highest scores for participants engaging in three or more EDBs. Whilst only correlational, this analysis indicates a progressive increase in obsessive-compulsive symptoms when the frequency of EDBs increases. However, an important implication is whether heightened obsessive-compulsive symptoms precede the increase in severity of eating disorder pathology, or whether elevated EDBs result in an increase in obsessive-compulsive symptoms. Identification of such causal relationships would shed further light on findings of Channon and DeSilva (1985), who reported that weight restoration in AN patients was associated with a decline in obsessive-compulsive symptoms on the MOCI. In addition, it would add to research on the maintenance and prognosis of eating disorders, such as that of Thiel and colleagues (1998), who found that comorbid OCD was not associated with poorer eating disorder prognosis.

**Conclusion**

In conclusion, the findings of the current study have provided further support for the relationship between eating disorder and OCD symptomatology. Whilst women with an eating disorder reported the strongest concerns over eating, shape, and weight, and more frequently engaged in disordered eating behaviours than other clinical groups, eating disorder symptoms in the clinical range were also common among women with OCD and those with depression. Higher scores on the EDE-Q were associated with elevated scores on the washing, checking, ordering, obsession, hoarding and mental neutralisation symptom domains of OCD, with obsessions demonstrating the strongest relationship. Women with an eating disorder reported scores of obsessive-compulsive symptoms that were largely comparable to their counterparts with OCD. In the following
study, investigation of the relationship between eating disorders and OCD extends beyond symptom overlap and statistical comorbidity, and incorporates a more recently established construct of obsessive-compulsive symptoms, that being obsessive beliefs.
Chapter 8

Study 2: An Examination of the Relationship Between Obsessive Beliefs and Eating Disorder Symptomatology

The overall aim of the second study was to examine obsessive beliefs measured by the OBQ-44 among a clinical sample of women with eating disorders, OCD, and depression, and a community-based comparison group. As this is one of the first studies known to the author to administer the OBQ-44 to an eating disorder population, a series of exploratory analyses were utilised to examine patterns, similarities, and variations in obsessive beliefs across the clinical and non-clinical groups. Obsessive-compulsive symptoms were also entered as a covariate to evaluate whether relationships between obsessive beliefs and eating disorder symptoms are mediated by their mutual relationship with obsessive-compulsive symptoms. Research questions addressed in this study include:

1. What is the strength of association between shape and weight concerns and general obsessive beliefs measured by the OBQ-44?

2. Are there differences in obsessive-compulsive cognitions across eating disorder, OCD, depression, and community control groups?

3. After controlling for general symptoms of OCD, are there significant differences in obsessive-compulsive cognitions when comparing individuals with eating disorders, OCD, depression, and community controls?

4. Are there differences in obsessive-compulsive cognitions across the eating disorder diagnostic categories?

Method

Please refer to the general Method section reported in Chapter 5 for a detailed summary of the sample of participants, measures, and procedures used in this study.
Results

Correlations Between Eating Disorder Symptoms and Obsessive Beliefs

Correlations between the EDE-Q and OBQ-44 were computed to examine general relationships between obsessive-beliefs and eating disorder symptomatology, refer to Table 9. This matrix utilised the entire sample on the basis that more specific group-based analyses would be forthcoming.
Table 9

Correlation Matrix for Scores on the EDE-Q and the OBQ-44 for the Entire Sample

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (N = 1026)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Restraint</td>
<td>1</td>
<td>.69**</td>
<td>.69**</td>
<td>.71**</td>
<td>.83**</td>
<td>.39**</td>
<td>.45**</td>
<td>.40**</td>
<td>.45**</td>
</tr>
<tr>
<td>2. Weight Concern</td>
<td>1</td>
<td>.93**</td>
<td>.82**</td>
<td>.96**</td>
<td>.43**</td>
<td>.48**</td>
<td>.45**</td>
<td>.50**</td>
<td></td>
</tr>
<tr>
<td>3. Shape Concern</td>
<td>1</td>
<td>.82**</td>
<td>.97**</td>
<td>.46**</td>
<td>.50**</td>
<td>.46**</td>
<td>.52**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Eating Concern</td>
<td>1</td>
<td>.85**</td>
<td>.49**</td>
<td>.54**</td>
<td>.53**</td>
<td>.57**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. EDE-Q global score</td>
<td>1</td>
<td>.46**</td>
<td>.52**</td>
<td>.48**</td>
<td>.53**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Responsibility/Threat</td>
<td>1</td>
<td>.77**</td>
<td>.76**</td>
<td>.93**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Perfectionism/Certainty</td>
<td>1</td>
<td>.69**</td>
<td>.92**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Imp/Control of Thoughts</td>
<td>1</td>
<td>.87**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. OBQ-44 total score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Note. ** Correlation is significant at the .001 significance level (2-tailed).
Correlations between the EDE-Q and OBQ-44 subscales were generally moderate in strength, with correlation coefficients ranging from .39 to .54 between the EDE-Q and OBQ-44 subscales. Only minor variation was evident in the magnitude of correlations between the subscales on these two measures. Nonetheless, each EDE-Q subscale and the EDE-Q global score maintained the strongest correlation with the Perfectionism/Intolerance of Uncertainty belief domain on the OBQ-44, followed by the Importance/Control of Thoughts subscale, and the Responsibility/Threat Estimation domain. The correlation between the global average item score on the EDE-Q and the OBQ-44 total score was moderate.

**Obsessive Beliefs Across Clinical and Non-Clinical Groups**

Descriptive statistics for the OBQ-44 across the eating disorder, OCD, depression, and community control groups are displayed in Table 10. A one-way between-subjects ANOVA was conducted to examine differences in the OBQ-44 total score across the four groups. As shown, a significant overall effect was found, with Tukey post-hoc tests ($\alpha = .05$) revealing that participants in the community control group demonstrated significantly lower scores on this measure when compared with the three clinical groups. No significant differences emerged when comparing the eating disorder, OCD, and depression groups. Examination of the descriptive statistics indicates that participants with an eating disorder or depression reported mildly higher OBQ-44 total scores than participants with OCD. A one-way between-subjects MANOVA was conducted to examine differences in OBQ-44 subscale scores across the four groups. A significant overall multivariate effect was found, Wilks’ $\Lambda = .52$, $F(9, 1136.71) = 39.54$, $p < .001$, multivariate $\eta^2 = .20$. Follow-up univariate ANOVA’s were computed for each subscale. Refer to Table 10 for $F$ statistics and follow-up Tukey post hoc analysis ($\alpha = .05$).
Table 10

*Mean and Standard Deviation Scores on the OBQ-44 Across the Diagnostic Groups*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ED (n = 80)</th>
<th>OCD (n = 19)</th>
<th>DC (n = 48)</th>
<th>CC (n = 325)</th>
<th>Entire sample (n = 1026)</th>
<th>Post-hoc comparisons¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>F(df = 3, 469)</td>
</tr>
<tr>
<td>Resp/Threat</td>
<td>70.26 (24.79)</td>
<td>73.14 (20.43)</td>
<td>71.21 (23.37)</td>
<td>41.50 (15.93)</td>
<td>51.23 (21.00)</td>
<td>83.88**</td>
</tr>
<tr>
<td>Peri/Certainty</td>
<td>86.32 (19.99)</td>
<td>78.05 (18.83)</td>
<td>82.84 (16.56)</td>
<td>49.75 (17.89)</td>
<td>61.69 (22.47)</td>
<td>122.39**</td>
</tr>
<tr>
<td>Imp/Control</td>
<td>46.98 (18.56)</td>
<td>44.74 (18.84)</td>
<td>47.79 (14.70)</td>
<td>25.07 (10.09)</td>
<td>31.47 (14.93)</td>
<td>99.25**</td>
</tr>
<tr>
<td>OBQ-44 total</td>
<td>203.55 (58.55)</td>
<td>195.92 (48.23)</td>
<td>201.84 (48.32)</td>
<td>116.32 (38.75)</td>
<td>144.39 (53.24)</td>
<td>128.24**</td>
</tr>
</tbody>
</table>

*Note.* ¹ Sig. post-hoc comparisons (*p* < .05).
²*p* < .001.
As shown in Table 10, all univariate ANOVA’s were significant, with consistent trends evident from the post-hoc tests. Scores for participants with an eating disorder were consistently greater than community controls, however no significant differences emerged between participants in the OCD, depression, and eating disorder groups. Follow-up review of the descriptive statistics indicates very minor variation in scores on the Responsibility/Threat Estimation and Importance/Control of Thoughts subscales across the clinical groups. Higher scores were evident for the eating disorder group on the Perfectionism/Intolerance of Uncertainty subscales, particularly when compared with the OCD group. Examination of Cohen’s $d$ effect size estimates with 95% confidence intervals provides convergent evidence for these findings, refer to Figure 13.
Effect sizes approach zero for comparisons between the eating disorder, OCD, and depression groups on the Responsibility/Threat Estimation subscale, the Importance/Control of Thoughts subscale, and the OBQ-44 total score. Small and medium effect sizes respectively were found when comparing the eating disorder and depression groups and the eating disorder and OCD groups on the Perfectionism/Certainty subscale. Effect sizes for the clinical and community control group comparisons were approximately two standard deviation points in magnitude,
which indicates an exceptionally high difference in means on all three obsessive belief subscales.

To evaluate the third research question and examine the variability in obsessive belief scores that could be accounted for by obsessive-compulsive symptomatology, OCI-R scores were entered as a covariate for the above analysis. Correlational data from previous studies (see OCCWG, 2005) indicate a moderate to high association between obsessive beliefs and general obsessive-compulsive symptomatology, and thus obsessive-compulsive symptoms may account for elevated scores on measures of obsessive-beliefs. Differences that emerged between the clinical groups on the OCI-R in Study 1 also indicated variability in the severity of obsessive-compulsive symptoms, and therefore the degree to which severity of obsessive-compulsive symptoms accounts for obsessive beliefs scores warrants investigation. Table 11 displays the marginal means and standard error scores for this analysis. The marginal means represent mean scores for each obsessive belief after variability that can be attributed to obsessive-compulsive symptoms is accounted for statistically. As such, these values represent descriptive statistics following removal of variance in obsessive beliefs that is due to obsessive-compulsive symptoms on the OCI-R.
Table 11

Marginal Means on the OBQ-44 Following Introduction of OCI-R Scores as a Covariate

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ED (n = 80)</th>
<th>OCD (n = 19)</th>
<th>DC (n = 48)</th>
<th>CC (n = 325)</th>
<th>F(df = 3, 468)</th>
<th>Post-hoc comparisons¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SE)</td>
<td>M (SE)</td>
<td>M (SE)</td>
<td>M (SE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resp/Threat</td>
<td>59.03 (1.95)</td>
<td>45.79 (4.15)</td>
<td>59.98 (2.41)</td>
<td>47.56 (0.98)</td>
<td>13.91**</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Perf/Certainty</td>
<td>76.71 (1.98)</td>
<td>54.66 (4.20)</td>
<td>73.23 (2.44)</td>
<td>54.93 (1.00)</td>
<td>38.79**</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Imp/Control</td>
<td>39.75 (1.37)</td>
<td>27.14 (2.90)</td>
<td>40.56 (1.69)</td>
<td>28.97 (0.69)</td>
<td>25.15**</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>OBQ-44 total</td>
<td>175.48 (4.48)</td>
<td>127.59 (9.52)</td>
<td>173.77 (5.52)</td>
<td>131.46 (2.26)</td>
<td>34.63**</td>
<td>1, 2, 3</td>
</tr>
</tbody>
</table>

Note. ¹ Sig. post-hoc comparisons (p < .05): 1: ED>OCD, 2: DC>OCD, 3: ED, DC>CC.
²p < .001.
Accounting for the effects of obsessive-compulsive symptoms resulted in a mild reduction in scores on the OBQ-44 for participants in the eating disorder and depression groups. By contrast, mean scores on the OBQ-44 for women with an OCD decreased considerably following introduction of the covariate. This finding indicates that obsessive-compulsive symptoms accounted for a large proportion of variance in obsessive belief scores for the OCD group but not for the eating disorder or depression groups. As shown, a univariate ANOVA yielded a significant overall result for all three OBQ-44 subscales and the OBQ-44 total score. Post-hoc analyses incorporated Bonferroni adjusted pairwise comparisons ($\alpha = .008$), and were conducted on the marginal means. Results indicated that there were no significant differences between the community control and OCD groups on the OBQ-44 after accounting for general OCD symptoms. However, after accounting for the effects of obsessive-compulsive symptomatology on the OCI-R, participants with an eating disorder or those with depression demonstrated significantly higher obsessive belief scores when compared with the OCD and community control groups across all OBQ-44 subscales and the OBQ-44 total score.

**Obsessive Beliefs Across Eating Disorder Diagnostic Categories**

Further to the finding that women with eating disorders demonstrate higher obsessive belief scores than women with OCD after controlling for general OCD symptoms, differences in obsessive beliefs on the OBQ-44 were assessed across the eating disorder categories. Refer to Table 12 for a summary of the descriptive statistics for this analysis.
Table 12

Mean and Standard Deviation Scores on the OBQ-44 Across the Eating Disorder Diagnostic Categories

<table>
<thead>
<tr>
<th>Subscale</th>
<th>AN (n = 28) M (SD)</th>
<th>BN (n = 15) M (SD)</th>
<th>EDNOS (n = 8) M (SD)</th>
<th>Unspecified ED (n = 8) M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resp/ Threat</td>
<td>72.50 (26.61)</td>
<td>63.07 (24.91)</td>
<td>69.91 (23.76)</td>
<td>84.38 (27.50)</td>
</tr>
<tr>
<td>Perf/ Certainty</td>
<td>90.63 (19.39)</td>
<td>83.84 (18.82)</td>
<td>90.00 (12.40)</td>
<td>96.38 (25.04)</td>
</tr>
<tr>
<td>Imp/Cont of Thou</td>
<td>47.92 (21.01)</td>
<td>44.20 (16.96)</td>
<td>50.88 (18.50)</td>
<td>58.20 (20.05)</td>
</tr>
<tr>
<td>OBQ-44 total</td>
<td>211.01 (69.88)</td>
<td>191.10 (54.67)</td>
<td>210.79 (49.93)</td>
<td>239.95 (69.80)</td>
</tr>
</tbody>
</table>

The results in Table 12 indicate that participants with AN had elevated total scores on the OBQ-44 when compared with women with BN. Whilst only minor differences emerged between the AN and BN groups on the Importance/Control of Thoughts subscale, participants with AN demonstrated higher scores on Responsibility/Threat Estimation and Perfectionism/Certainty when compared with participants with BN. Women in the EDNOS group reported scores that were highly consistent with women in the AN group across the OBQ-44 subscales and total score. Women with an unspecified eating disorder demonstrated markedly higher scores across all OBQ-44 subscales and the OBQ-44 total score when compared with the AN, BN, and EDNOS groups.

Independent samples t-tests with Bonferroni adjusted alpha levels (α = .013) were used to compare scores on the OBQ-44 across the AN and BN groups. The EDNOS and unspecified eating disorder groups were not included in this analysis due to the small sample sizes in these groups. When comparing the AN and BN groups, results indicated that there were no significant differences in scores on the OBQ-44 total score, \( t(41) = 1.02, p = .31, d = 0.33 (-0.31, 0.96) \), or the OBQ-44 subscales: Importance/Control of Thoughts, \( t(41) = 1.13, p = .26, d = 0.36 (-0.27, 0.99) \);
Responsibility/Threat Estimation, \( t(41) = 1.11, p = .28, d = 0.36 (-0.28, 0.98); \) and Perfectionism/Intolerance of Uncertainty, \( t(41) = 0.59, p = .56, d = 0.19 (-0.44, 0.82). \)

**Discussion**

Recent studies have sought to identify the obsessive beliefs that are most salient to the development of obsessions and compulsions in the context of OCD (Abramowitz et al., 2006, 2007; OCCWG, 1997, 2001, 2003, 2005; Tolin et al., 2006). Research examining these beliefs among clinical samples is accumulating, however, few studies have evaluated the incidence of obsessive beliefs among an eating disorder population, despite well established links between eating disorders and OCD (Godart et al., 2000; Godart et al., 2002; Halmi et al., 1991; Shafran, 2002). In the current study, a series of correlational and group-based analyses were conducted to determine the presence and severity of obsessive beliefs among a clinical sample of women with eating disorders, with comparisons made with OCD and depression groups, and a non-clinical community control group.

**Correlations Between Eating Disorder Symptoms and Obsessive Beliefs**

Correlations between the EDE-Q global score and the total score on the OBQ-44 revealed a moderate correlation. This corresponds with the correlation between the EDE-Q and general obsessive-compulsive symptoms on the OCI-R, which was found to be moderate in strength in Study 1. The magnitude of the relationship between eating disorder symptoms and obsessive beliefs exceeds findings by Humphreys and colleagues (2007), who reported a correlation of .26 between the OBQ-87 and the EAT-26. Since the EAT-26 was initially developed to assess symptoms specific to AN (Mond et al., 2004b), its use as a screening measure or case-finding psychometric tool for eating disorders has been questioned (Anderson & Williamson, 2002; Mond et al., 2004b; Patton & Szmukler, 1995). It could be speculated that important links between eating disorders and obsessive beliefs may be missed by a measure that does not broadly assess eating disorder symptoms, which may provide some insight into the
weaker correlation found in Humphreys and colleagues’ study. Differences in the nature of the sample utilised in Humphreys and colleagues’ research may also provide an explanation for variations in correlation strength, since a sample of college students was recruited to participate in the research in the absence of a clinical-group comparisons.

In relation to correlations between EDE-Q and OBQ-44 subscales, the Perfectionism/Intolerance of Uncertainty subscale of the OBQ-44 had marginally higher correlations with the four EDE-Q subscales when compared with the Responsibility/Threat Estimation and Importance/Control of Thoughts subscales. This is not surprising based on the strong association between perfectionism and eating disorders (Bulik et al., 2003; Forbush et al., 2007; Franco-Paredes et al., 2005; Halmi et al., 2000; Wade, 2007). It was found that the four EDE-Q subscales had similar magnitudes in their association with Perfectionism/Intolerance of Uncertainty, and the Responsibility/Threat Estimation and Importance/Control of Thoughts subscales. Given that perfectionism has been strongly linked to restrictive behaviours and dietary restraint, there is a strong theoretical rationale that the Perfectionism/Intolerance of Uncertainty subscale would have been more strongly related to the Restraint subscale of the EDE-Q, however this was not the case in the current study.

**Obsessive Beliefs Across Clinical and Non-Clinical Groups**

Group-based analyses on the OBQ-44 revealed only small differences among the clinical groups. No significant differences were found between the eating disorder, OCD, or depression groups on the Perfectionism/Intolerance of Uncertainty, Responsibility/Threat Estimation, or Importance/Control of Thoughts subscales of the OBQ-44, or on the OBQ-44 total score. Examination of descriptive statistics indicated no consistent pattern in the data, with the eating disorder group scoring marginally higher than the OCD and depression groups on Perfectionism/Intolerance of Uncertainty. By contrast, the OCD group scored marginally higher than the eating
disorder and depression groups on Responsibility/Threat Estimation, whilst the depression group scored marginally higher than the eating disorder and OCD groups on Importance/Control of Thoughts. All effect sizes for the clinical-group comparisons were small or negligible. These findings partially coincide with research that has adopted the OBQ-87 and OBQ-44 with clinical populations (Lavender et al., 2006; OCCWG, 2005; Tolin et al., 2006). The OCCWG (2005) reported that the OBQ-44 does not always discriminate well across clinical groups, particularly when comparing OCD and anxious controls on the Perfectionism/Intolerance of Uncertainty subscale. This conclusion has been supported by Tolin and colleagues (2006), who found that participants with OCD and anxious controls did not differ on the Responsibility/Threat Estimation subscale of the OBQ-87 or the OBQ-44.

In Lavender and colleagues’ (2006) evaluation of obsessive beliefs among an eating disorder and OCD population, women with a current eating disorder had significantly higher scores on the Perfectionism, Intolerance of Uncertainty, Overestimation of Threat, and Importance of Thoughts subscales of the OBQ-87 when compared with individuals with OCD. This was an intriguing result given that the OBQ-44 was developed to evaluate obsessive beliefs in relation to OCD symptomatology, yet women with an alternate diagnosis had higher scores on this measure. Based on findings of the current study, it can be further advocated that obsessive beliefs are not exclusive to individuals with OCD, and that the OBQ-44 is a measure of obsessional beliefs that taps into general fixations associated with a range of clinical disorders, irrespective of the cognitive focus of the disorder. In this regard, various disorders can yield equivalent scores on the OBQ-44, despite differing diagnoses across individuals. To illustrate this contention, an individual with social phobia may report high scores on items such as “For me, making a mistake is as bad as failing completely” and “If my actions could have even a small effect on a potential misfortune, I am responsible for the outcome”, as they interpret these items in the context of a negative self-evaluation
or themes of helplessness or hopelessness for future social interactions. In the context of eating disorders, these same items may be interpreted in relation to failure surrounding the struggle to reach a target weight and a sense of responsibility towards engaging in restrictive behaviours in order to control body shape and reduce the risk of body weight shooting up.

Research has provided some support for this conjecture through the evaluation of relationships between obsessive beliefs and worry (Dugas et al., 2004). Myers and colleagues (2008) demonstrated that all obsessive belief domains on the OBQ-87 are associated with worry on the Penn State Worry Questionnaire, prompting the authors to question the utility of measuring a set of cognitions that are not clearly distinguishable across clinical groups. However, the nature of worry differs in accordance with the disorder in question, with Dugas and colleagues (1998) concluding that GAD-based worry is linked to future threat whilst OCD-based worry is associated with more urgent threats with immediate consequences. Whether an assessment of the specific content of obsessive beliefs can be obtained from a broad measure such as the OBQ-44 remains to be seen since it is difficult to disseminate the nature of obsessional beliefs from a broad measure such as this. Nonetheless, the OBQ-44 provides researchers and clinicians alike with a useful assessment tool regarding the cognitive biases and thought content maintained by an individual, which in the context of eating disorders, provides valuable information regarding the risk of obsessive-compulsive symptomatology.

Community controls reported significantly lower scores on the OBQ-44 subscales and total score when compared with the eating disorder, OCD, and depression groups. Very large Cohen’s $d$ effect sizes were found for all clinical and community control group comparisons. This finding is consistent with previous studies that have compared scores on the OBQ-87 across clinical and non-clinical groups (Lavender et al., 2006; OCCWG, 1997, 2005; Tolin et al., 2006). Whilst previous
studies have compared community controls with individuals with OCD, other anxiety disorders, and eating disorders, the current study adds to this body of literature by comparing a community control sample with those with a history of eating disorders, OCD, or depression.

**Obsessive-Compulsive Symptoms, Obsessive-Beliefs, and Eating Disorder Symptoms**

To further tease out the relationship between eating disorder symptomatology and obsessive beliefs, obsessive-compulsive symptoms (based on scores on the OCI-R) were entered as a covariate. The purpose of this was to evaluate whether significant differences in obsessive beliefs emerged between the eating disorder, OCD, and depression groups after controlling for symptoms of OCD. Although marginal means for the eating disorder and depression groups were unaffected by the covariate, a marked reduction in OBQ-44 marginal means was noted for the OCD group, indicating that much of the variability in obsessive belief scores for women with OCD was associated with obsessive-compulsive symptoms. Women with an eating disorder or depression had significantly higher scores on all OBQ-44 subscales and the OBQ-44 total score when compared with their OCD counterparts after controlling for obsessive-compulsive symptoms. This finding demonstrates that whilst women with an eating disorder or depression experience obsessive beliefs, these beliefs are not accounted for by obsessive-compulsive symptoms and may be precipitated and perpetuated by other cognitive phenomena. Building on this contention, women with an eating disorder or depression had highly comparable scores across all obsessive beliefs domains after accounting for obsessive-compulsive symptoms, which indicates that obsessive beliefs, whilst high, are not associated with symptoms of OCD for both these groups. This finding builds on that of Tolin and colleagues (2006), whereby depression and trait anxiety were entered as covariates in evaluating the relationship between diagnosis and obsessive beliefs. Participants with OCD had significantly higher scores on all but
one OBQ-44 subscale prior to controlling for depression and trait anxiety. After controlling for depression, however, there were no significant differences between OCD and the anxious control groups on the OBQ-44 subscales or the OBQ-44 total score. More striking however was that after controlling for trait anxiety, no significant differences emerged between the OCD, anxious control, or community control groups on the OBQ-44 (Tolin et al., 2006). Findings of the current study provide further evidence for variation in the nature of obsessive beliefs experienced by women who have different forms of psychopathology, and the potential mediation of obsessive-compulsive symptoms. This finding builds on those of Tolin and colleagues, and suggests that general symptoms of anxiety, depressive symptoms, and symptoms of OCD all have the potential to account for variability in obsessive beliefs.

**Obsessive Beliefs Across Eating Disorder Diagnostic Categories**

No significant differences emerged on the OBQ-44 across the eating disorder diagnostic groups, namely women with AN or BN. Participants with AN reported marginally higher scores of inflated responsibility and overestimation of threat, and greater perfectionism and intolerance of uncertainty when compared with women with BN, however only small to moderate effect sizes were evident. These findings are consistent with those of Lavender and colleagues (2006), who found that there were no significant differences on the OBQ-87 across diagnostic categories that incorporated AN, BN, and EDNOS. Of note, women with an unspecified eating disorder, that is, a self-reported diagnosis of an eating disorder without specifying AN, BN, or EDNOS, demonstrated elevated scores on all subscales of the OBQ-44 relative to the AN, BN, and EDNOS groups. This finding is difficult to interpret on the basis that the diagnosis of these women remains unconfirmed, and the sample size in this group was small.

Whilst several studies have now demonstrated few differences in obsessive beliefs across the eating disorder diagnostic categories, it is evident that all eating disorder groups maintain high scores on each subscale of the OBQ-44. This indicates
that across eating disorder categories, attitudes and beliefs that are consistent with the obsessive beliefs measured by the OBQ-44 are expressed. It is unclear based on this finding alone whether these beliefs are exclusive to the domain of eating, shape, and weight, or whether they generalise to other domains.

**Conclusion**

In conclusion, results of the current study have indicated that moderate to strong correlations exist between eating disorder symptoms and general obsessive beliefs measured by the OBQ-44. Scores on the OBQ-44 were similar across clinical groups, with few significant differences found between the eating disorder, OCD, and depression groups. A greater proportion of variance in obsessive beliefs is accounted for by obsessive-compulsive symptoms for those women with OCD when compared with their counterparts with either eating disorders or depression, with further research necessary to establish those cognitive constructs that account for obsessive beliefs among women with eating disorders. In the next study, a new measure of obsessive beliefs is developed, the OBQ-EDV, and will enable the measurement of cognitive domains examined by the OBQ-44 in the context of concerns over eating, shape and weight.
Chapter 9

Study 3: Development and Psychometric Evaluation of the Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV)

As described in the aims and rationale presented in Chapter 4 and the measures described in Chapter 5, a primary objective of the current research was to develop and validate a newly developed measure of obsessive beliefs in the domain of eating, shape, and weight, the OBQ-EDV. In this study, and as part of a thorough validation process, items within the OBQ-EDV are first subjected to a series of exploratory factor analyses to determine the factor structure of this measure and assess consistencies with the factor structure of the OBQ-44. This is followed by an analysis of the reliability and validity of the OBQ-EDV with regard to internal consistency, as well as assessing the face, content, criterion, and construct validity of this measure. Research questions addressed in this study included the following:

1. Based on factor analytic methods, do items within the OBQ-EDV cluster into the same constructs as the OBQ-44?
2. Does the OBQ-EDV demonstrate sound reliability with regards to internal consistency?
3. What is the strength of the intercorrelations within the OBQ-EDV?
4. Does the OBQ-EDV maintain a satisfactory level of face, content, criterion-related, and construct validity?

Method

Please refer to the general Method section reported in Chapter 5 for a detailed summary of the sample of participants, measures, and procedures used in this study.

Results

As described in the Measures section in Chapter 5, development of items within the OBQ-EDV was based on re-wording items contained in the OBQ-44. The purpose of this process was to enable measurement of obsessive beliefs that are specific to an
eating, shape, and weight domain. Re-wording of items was possible for 31 of the 44 OBQ-44 items, resulting in an initial pool of 31 OBQ-EDV items. These items were included within the questionnaire package that was administered to all participants.

**Factor Analysis of the OBQ-EDV**

**Data preparation and assumption testing.** Prior to assessing whether all variables satisfied the assumptions underlying factor analysis, frequency distributions were analysed to ensure that there were no data entry errors or missing data. Within the current study, a total sample of 1207 participants was recruited, 988 of whom completed the OBQ-EDV. On the basis that there were 31 items originally pooled to form the OBQ-EDV, this equates to a distribution of approximately 32 participants per variable, which will result in statistically reliable correlation coefficients and a sound data set for factor analysis (Tabachnick & Fidell, 2001). Due to the substantial number of participants falling within the clinical range of the EDE-Q (Average item global score > 4.0, \( n = 373 \)), it was also possible to conduct factor analytic procedures on this sub-sample in isolation. When developing measures to be utilised in clinical and community settings, it is common to model the factor structure on participants from the clinical population for which the measure was designed (e.g., OCCWG, 2005). Since participants in the community often score on the lower end of the continuum on clinical measures, conducting factor analyses on community samples can result in a factor structure that is confounded by floor effects (De Jonghe, Wetzels, Mulders, Zuidema, & Koopmans, 2009). This issue may be tempered by ensuring that the factor structure is developed on the basis of a sample that has scores that are normally distributed on the measure, or by administering the questionnaire to a population of participants who score highly on related variables, in this case, symptoms of eating disorders and OCD. Factor analysis of the OBQ-EDV was therefore based on the sample of participants who scored in the clinical range on the EDE-Q, prior to being re-analysed using the entire sample.
Preliminary assumption testing of normality was performed to examine whether the data met the requirements underlying the parametric procedures to be conducted. Although factor analysis is considered to be robust to violations in the normality assumption when working with large samples (Tabachnick & Fidell, 2001), normality was assessed by evaluating normality plots as well as skewness and kurtosis. Despite mild variation in the nature of the distributions for the 31 items, no major violations in normality that would impede on the analyses to be conducted were found.

The factorability of the data set was also evaluated. The anti-image correlation matrix, particularly the Measures of Sampling Adequacy (MSA), was examined to identify whether the data were likely to factor well. MSA correlations ranged from .84 to .90, that is, they were all greater than .5 as recommended by Khadra and Rawabdeh (2006). Examination of the Kaiser-Meyer-Olkin (KMO) MSA was also carried out to evaluate partial or inter-correlations among variables. Analysis of this index revealed a value of .93, indicating a high degree of common variance among the items. This was further validated by Bartlett's Test of Sphericity, which tests the null hypothesis that the inter-correlation matrix comes from a population where the variables are not collinear and any non-zero correlations are due to sampling error. Results indicated a highly significant value ($\chi^2 = 5941.90, p < .001$), which provides further validation for this data set being appropriate for factor analysis.

**Principal Axis factoring procedure with Direct Oblimin rotation.** Items were subjected to a Principal Axis factor extraction procedure with Direct Oblimin rotation with Kaiser Normalisation. A Principal Axis factoring procedure was utilised as this technique maximises variance extracted by non-orthogonal (or correlated) factors (Tabachnick & Fidell, 2001). Developers of the original OBQ-44 (OCCWG, 2005) as well as authors who have conducted independent psychometric analysis of this measure (refer to Myers et al., 2008; Woods et al., 2004) found subscales in the OBQ-44 to be moderately correlated. It was hypothesised that factors within the OBQ-EDV
would be similarly related on the basis that they each tap into cognitive processes and behaviours measured by the OBQ-44, with a focus on the domain of eating, shape, and weight, thus providing a rationale for utilising a non-orthogonal approach.

Examination of commonality values was conducted prior to factor extraction. Commonalities describe the proportion of variance in each variable that is explained or accounted for by the factors. Commonality values of .40 or greater were required for the item to be included for extraction. All 31 items were found to meet this criterion. Factor selection was based on the Kaiser Criterion, which stipulates that Eigenvalues must be greater than 1.0 in order to represent meaningful factors.

The Principal Axis factoring procedure, which was conducted on all participants with global scores on the EDE-Q within the clinical range, separated the 31 items into four factors. That is, four factors maintained Eigenvalues that were greater than 1.0 prior to and following extraction, and also after rotation. Following rotation, the four factors accounted for 53.15% of the variance in scores across all 31 items. A large proportion of variance was accounted for by Factor 1, as this factor maintained an Eigenvalue of 12.09 and accounted for 39.00% of the variance in the items. The final three factors maintained smaller Eigenvalues of 1.98, 1.30, and 1.11 respectively, and accounted for an additional 6.39%, 4.20%, and 3.57% of the variance in the 31 items within the measure. Examination of Cattell’s Scree Plot (graphically depicts the magnitude of each Eigenvalue) verified that the 31 items were best extracted into four separate factors. Results of this factor analytic procedure using the entire sample ($n = 988$) yielded highly comparable results, with an equivalent factor structure being obtained.

Factor loadings for each item following a Direct Oblimin rotation are displayed in Table 13. Only factor loadings greater than 0.4 were considered appropriate. Whilst conservative, this approach is often employed to facilitate separation of items to factors (Howell, 1997; Tabachnick & Fidell, 2001), particularly when factors are correlated.
Table 13

*Factor Structure of the OBQ-EDV Using Principal Axis Factoring with Direct Oblimin Rotation*

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>$h^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>RespThreat3</td>
<td>0.67</td>
<td>0.07</td>
<td>0.05</td>
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</tr>
<tr>
<td>9</td>
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<td>0.02</td>
<td>-0.09</td>
<td>0.47</td>
</tr>
<tr>
<td>6</td>
<td>Perfectionism1</td>
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<tr>
<td>3</td>
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<tr>
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<td>-0.19</td>
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<td>0.59</td>
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<tr>
<td>8</td>
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<td>-0.18</td>
<td>0.37</td>
</tr>
<tr>
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<td>0.48</td>
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<td>-0.09</td>
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<td>28</td>
<td>Perfectionism6</td>
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<td>RespThreat7</td>
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<td>-0.01</td>
<td>0.15</td>
<td>0.46</td>
<td>0.60</td>
</tr>
</tbody>
</table>

*Note.* Extraction method: Principal Axis Factoring. Rotation method: Direct Oblimin with Kaiser Normalisation. Rotation converged in 7 iterations. $h^2$ refers to commonality values following extraction.
Of the 31 items, nine loaded on Factor 1, eight loaded on Factor 2, six loaded on factor 3, and five loaded on Factor 4. Examination of the item content revealed that Factor 1 primarily consisted of items pertaining to Responsibility/Threat Estimation (e.g., “If I don’t restrict my diet, then I am to blame for the consequences”), Factor 2 consisted of Importance/Control of Thoughts items (e.g., “Having a thought about eating large amounts of food is as bad as actually eating the food”), Factor 3 consisted of Perfectionism items (e.g., “I am not happy with my body unless it is perfect”), and Factor 4 consisted of Intolerance of Uncertainty items (e.g., “I must not eat certain food if I am unsure of the effect it will have on my weight”). Aside from separating the Perfectionism/Intolerance of Uncertainty subscale into two separate factors, this factor structure replicates that of the OBQ-44.

Four of the 31 items did not have a loading of at least .40 on any of the four factors. Two of these items were hypothesised to cluster in the Responsibility/Threat Estimation subscale (Item 1: “I often think eating small amounts of food will cause me to gain weight”; Item 21: “Even eating small amounts of food increases the risk of weight gain”), yet had low to moderate loadings on both the Responsibility/Threat Estimation and Importance/Control of Thoughts subscales and did not load exclusively on one factor. Another item hypothesised to cluster in the Responsibility/Threat Estimation subscale (Item 19: “Even if gaining weight is very unlikely, I should try to prevent it at any cost”) also demonstrated multiple loadings of moderate strength on the Responsibility/Threat Estimation (.32) and Importance/Control of Thoughts (.36) subscale, and maintained a weak loading on the Intolerance of Uncertainty subscale (.27). One item predicted to load on the Intolerance of Uncertainty subscale (Item 8: “If I’m not absolutely sure of what I eat, I’m bound to put on weight”) recorded a moderate loading on the Responsibility/Threat Estimation subscale (.35), and weak loadings on the Importance/Control of Thoughts subscale (.24) and the Intolerance of Uncertainty subscale (.18).
Two items loaded on factors that were contrary to predictions based on theoretically derived content and the factor structure of the OBQ-44. Item 6, "I must keep working at my weight until it is just right", was hypothesised to load on the Perfectionism subscale, however factor analysis revealed a high loading (.57) on the Responsibility/Threat Estimation subscale and only a weak loading on Perfectionism (-.12). Similarly, Item 18, "When I see an opportunity to do so, I must act to prevent weight gain", was predicted to load on the Responsibility/Threat Estimation factor, however demonstrated a high loading exclusively on Intolerance of Uncertainty (-.46). This item did maintain a moderate loading on the Responsibility/Threat Estimation subscale, however this was not of sufficient strength to justify inclusion in the final measure. As such, Items 6 and 18 were removed from the questionnaire.

Only one item had a multiple high loading across two factors. Item 15, "Failing to prevent gaining weight is just as bad as deliberately gaining weight", maintained a loading of greater than .40 on both the Responsibility/Threat Estimation (.45) and Importance/Control of Thoughts (-.43) subscales. Whilst the highest loading applied to the Responsibility/Threat Estimation subscale, this item was removed from the final factor structure as it failed to discriminate between two types of obsessive belief.

In summary, all items within the OBQ-EDV demonstrated an adequate commonality value and the majority had high factor loadings both prior to and following rotation. The factor structure of the OBQ-EDV is largely comparable to that of the OBQ-44, with very few items loading on multiple factors, or on factors that are contrary to those they were theoretically designed to measure.

**Reliability Analysis of the OBQ-EDV**

**Internal Consistency.** Internal consistency, typically measured using Cronbach’s alpha coefficient, refers to the degree that all items are equivalent and measure the same underlying construct (Cohen & Swerdlik, 2005). Cronbach’s alpha computes the mean of all possible split-half reliabilities across the items within a scale,
thus obtaining a measure of internal consistency (Aron, Aron, & Coups, 2006; Cohen & Swerdlik, 2005; Green & Salkind, 2007; Salkind, 2003). Cronbach’s alpha coefficients that exceed .70 are considered acceptable whilst coefficients that are greater than .80 are considered high (Aron et al., 2006; Salkind, 2003). In order to assess the internal consistency of the OBQ-EDV subscales, a Cronbach’s alpha coefficient was computed for each subscale and the OBQ-EDV total score, refer to Table 14.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Number of Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility/Threat Estimation</td>
<td>8</td>
<td>.84</td>
</tr>
<tr>
<td>Importance/Control of Thoughts</td>
<td>7</td>
<td>.87</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>6</td>
<td>.89</td>
</tr>
<tr>
<td>Intolerance of Uncertainty</td>
<td>4</td>
<td>.87</td>
</tr>
<tr>
<td>OBQ-EDV total score</td>
<td>25</td>
<td>.94</td>
</tr>
</tbody>
</table>

As shown, all four subscales maintained Cronbach’s alpha coefficients that exceeded .80, with all subscales aside from Responsibility/Threat Estimation exceeding .85. This indicates a high level of agreement in scores across the items within the OBQ-EDV, with the pools of items within each subscale demonstrating an acceptable level of internal consistency. More impressive was the internal consistency coefficient of the OBQ-EDV total score, with a value above .90 being obtained. This indicates an exceptional level of internal consistency for the total score of the OBQ-EDV.

Table 15 presents an item analysis of the OBQ-EDV. This analysis revealed that all items within the Responsibility/Threat Estimation, Perfectionism, and
Intolerance of Uncertainty subscales contribute to the overall alpha coefficient reported for these subscales. This is based on the finding that removing any of the items would reduce the internal consistency of the subscale (e.g., removing Item 5 from the Responsibility/Threat Estimation subscale would decrease the overall alpha coefficient from .84 to .81 for this subscale). This is further demonstrated by the moderate to high corrected item-total correlations, which indicate that scores on each item correlate well with the total score for the subscale. In effect, correlations in the range of 0.4 to 0.8 indicate a moderate to high degree of communality among the items whilst ensuring that each item maintains an element of uniqueness within the subscale.
Table 15

*Item Analysis for the Four Subscales in the OBQ-EDV*

<table>
<thead>
<tr>
<th>Subscale/Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility/Threat Estimation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RespThreat1</td>
<td>.42</td>
<td>.84</td>
</tr>
<tr>
<td>RespThreat2</td>
<td>.50</td>
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<td>RespThreat3</td>
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<tr>
<td>RespThreat4</td>
<td>.52</td>
<td>.83</td>
</tr>
<tr>
<td>RespThreat5</td>
<td>.68</td>
<td>.81</td>
</tr>
<tr>
<td>RespThreat6</td>
<td>.77</td>
<td>.80</td>
</tr>
<tr>
<td>RespThreat7</td>
<td>.53</td>
<td>.83</td>
</tr>
<tr>
<td>RespThreat8</td>
<td>.71</td>
<td>.81</td>
</tr>
<tr>
<td>Importance/Control of Thoughts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ImpConThou1</td>
<td>.73</td>
<td>.84</td>
</tr>
<tr>
<td>ImpConThou2</td>
<td>.49</td>
<td>.88</td>
</tr>
<tr>
<td>ImpConThou3</td>
<td>.46</td>
<td>.88</td>
</tr>
<tr>
<td>ImpConThou4</td>
<td>.81</td>
<td>.83</td>
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<tr>
<td>ImpConThou5</td>
<td>.82</td>
<td>.83</td>
</tr>
<tr>
<td>ImpConThou6</td>
<td>.63</td>
<td>.86</td>
</tr>
<tr>
<td>ImpConThou7</td>
<td>.62</td>
<td>.86</td>
</tr>
<tr>
<td>Perfectionism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perfectionism1</td>
<td>.61</td>
<td>.88</td>
</tr>
<tr>
<td>Perfectionism2</td>
<td>.80</td>
<td>.85</td>
</tr>
<tr>
<td>Perfectionism3</td>
<td>.65</td>
<td>.88</td>
</tr>
<tr>
<td>Perfectionism4</td>
<td>.76</td>
<td>.86</td>
</tr>
<tr>
<td>Perfectionism5</td>
<td>.61</td>
<td>.88</td>
</tr>
<tr>
<td>Perfectionism6</td>
<td>.81</td>
<td>.85</td>
</tr>
<tr>
<td>Intolerance of Uncertainty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntoleranceUncer1</td>
<td>.65</td>
<td>.87</td>
</tr>
<tr>
<td>IntoleranceUncer2</td>
<td>.77</td>
<td>.82</td>
</tr>
<tr>
<td>IntoleranceUncer3</td>
<td>.76</td>
<td>.82</td>
</tr>
<tr>
<td>IntoleranceUncer4</td>
<td>.74</td>
<td>.83</td>
</tr>
</tbody>
</table>
Two items within the Importance/Control of Thoughts subscale (ImpConThou2 and ImpConThou3) were found to mildly impede on the Cronbach’s alpha coefficient for this subscale, demonstrated by the increase in Cronbach’s alpha if these items were removed. Following detailed consideration, it was decided that these two items remain in the measure. This conclusion was based on the high overall internal consistency coefficient for the subscale, the relatively mild increase in Cronbach’s alpha that would result from the removal of the items (0.03 and 0.04 respectively), and the small size of the subscale since removing these two items would reduce the pool of items from seven to five.

**Intercorrelations of the OBQ-EDV Subscales**

Intercorrelations between the OBQ-EDV subscales were computed to determine the strength of association between the four factors. Table 16 displays Bivariate Pearson correlations between all OBQ-EDV subscales and the OBQ-EDV total score for the entire sample.

**Table 16**

*Intercorrelations between OBQ-EDV Subscales and the OBQ-EDV Total Score for the Entire Sample*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (N = 988)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Responsibility/Threat</td>
<td>1</td>
<td>.72**</td>
<td>.78**</td>
<td>.78**</td>
<td>.92**</td>
</tr>
<tr>
<td>2. Imp/Control of Thoughts</td>
<td>1</td>
<td>.75**</td>
<td>.76**</td>
<td>.89**</td>
<td></td>
</tr>
<tr>
<td>3. Perfectionism</td>
<td>1</td>
<td>.75**</td>
<td></td>
<td>.91**</td>
<td></td>
</tr>
<tr>
<td>4. Certainty</td>
<td></td>
<td></td>
<td></td>
<td>.89**</td>
<td></td>
</tr>
<tr>
<td>5. OBQ-EDV total score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* **Correlation is significant at the .001 significance level (2-tailed).
A strong association was found between all OBQ-EDV subscales. The strongest correlations were found between the Responsibility/Threat Estimation subscale and the Perfectionism and Intolerance of Uncertainty subscales. The relationship between Responsibility/Threat Estimation and Importance/Control of Thoughts was slightly weaker than correlations between other subscales. As would be expected, correlations between the OBQ-EDV subscales and total score were very strong.

These correlations were also computed for participants who scored in the clinical range for eating disorder symptomatology on the EDE-Q. These correlations yielded less strength than those incorporating the entire sample, with coefficients ranging from .52 to .62. Correlations between the OBQ-EDV subscales and total score ranged from .79 to .85.

Validity Assessment of the OBQ-EDV

Face Validity. At the researcher’s request, examination of the face validity of the OBQ-EDV was carried out by independent reviewers who had considerable experience working in the clinical areas of eating disorders, OCD, depression and associated psychiatric conditions. It was suggested that items within the OBQ-EDV appear to measure variants of anxiety, worry, and obsessionality with respect to eating, body shape, body dissatisfaction, and weight. It was contended that certain items have a focus on thought processes (e.g., “Having a thought about eating large amounts of food is just as bad as actually eating the food”) whilst others focus on the behavioural elements and consequences of thought (e.g., “Not having nutritional information about food I am about to eat upsets me greatly”), and that integration of cognitive-behavioural elements of obsessionality with respect to eating disorders are examined within the questionnaire. Other themes that were identified on the basis of item examination included ritualistic behaviour with respect to eating patterns and body checking, and engagement in thought-control processes with respect to concerns about eating,
shape, and weight. These findings substantiate the face validity of this measure.

**Content Validity.** Several protocols were undertaken to ensure the content validity of the OBQ-EDV with respect to content coverage and content relevance. Comprehensive literature searches were conducted to establish a solid foundation in regards to the measurement of eating, shape, and weight concerns; body checking; and cognitive processes regarding the consequences of weight gain. Measures of obsessive beliefs were reviewed, particularly the newly developed measures designed by the OCCWG (1997, 2001, 2003, 2005). Measures of obsessive-compulsive symptomatology such as the OCI-R, the Padua Inventory, and the Y-BOCS were also reviewed. As previously highlighted, items within the OBQ-EDV were based on those incorporated within the OBQ-44, however were re-worded to represent the eating, shape, and weight domain that is particularly salient to the eating disorder population. This process enabled convergence between a measurement of obsessive beliefs and the perceived risks associated with changes in weight or body shape.

**Criterion-Related Validity.** Concurrent criterion-related validity was measured by correlating scores on the OBQ-EDV with another measure of obsessive beliefs (e.g., OBQ-44), measures of general disordered eating (e.g., EDE-Q) and measures of obsessive-compulsive symptoms (e.g., OCI-R). Relationships between the OBQ-EDV and measures of specific characteristics of eating disorders (e.g., body checking cognitions, body checking behaviours, perfectionism) were also a focus of analysis. Correlations between subscales on the OBQ-EDV and OBQ-44 are shown in Table 17. All correlations presented in this section incorporated the entire sample.
Table 17

*Correlation Matrix for the OBQ-EDV and the OBQ-44 for the Entire Sample*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (N = 988)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. OBQ-EDV – Responsibility/Threat</td>
<td>1</td>
<td>.72**</td>
<td>.78**</td>
<td>.78**</td>
<td>.92**</td>
<td>.54**</td>
<td>.58**</td>
<td>.51**</td>
<td>.60**</td>
</tr>
<tr>
<td>2. OBQ-EDV – Imp/Control of Thoughts</td>
<td>1</td>
<td>.75**</td>
<td>.76**</td>
<td>.89**</td>
<td>.58**</td>
<td>.58**</td>
<td>.66**</td>
<td>.66**</td>
<td></td>
</tr>
<tr>
<td>3. OBQ-EDV – Perfectionism</td>
<td>1</td>
<td>.75**</td>
<td>.91**</td>
<td>.59**</td>
<td>.73**</td>
<td>.62**</td>
<td>.72**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. OBQ-EDV – Certainty</td>
<td>1</td>
<td>.89**</td>
<td>.54**</td>
<td>.58**</td>
<td>.55**</td>
<td>.61**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. OBQ-EDV – Total score</td>
<td>1</td>
<td>.62**</td>
<td>.69**</td>
<td>.65**</td>
<td>.72**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. OBQ-44 – Responsibility/Threat</td>
<td></td>
<td>1</td>
<td>.77**</td>
<td>.76**</td>
<td>.93**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. OBQ-44 – Perfectionism/Certainty</td>
<td></td>
<td>1</td>
<td>.69**</td>
<td>.92**</td>
<td></td>
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<tr>
<td>8. OBQ-44 – Imp/Control of Thoughts</td>
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<td></td>
<td>1</td>
<td>.87**</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. OBQ-44 – Total score</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. ** Correlation is significant at the .001 significance level (2-tailed).
Correlations between subscales on the OBQ-44 and the OBQ-EDV were positive and moderate to high in strength, with the highest inter-subscale correlation being between the Perfectionism subscale of the OBQ-EDV and the Perfectionism/Intolerance of Uncertainty subscale of the OBQ-44. Subscales on the OBQ-EDV generally maintained the strongest association with their corresponding subscale on the OBQ-44 (e.g., Importance/Control of Thoughts on the OBQ-EDV with Importance/Control of Thoughts on the OBQ-44) when compared with the other subscales. However, this was not the case for the Responsibility/Threat Estimation subscale on the OBQ-EDV, which maintained its strongest correlation with the Perfectionism/Intolerance of Uncertainty subscale of the OBQ-44. A strong positive correlation was evident between total scores on the OBQ-44 and the OBQ-EDV, indicating a strong level of association with some degree of independence and uniqueness.

Correlations were computed between the OBQ-EDV and the EDE-Q to evaluate the strength of association between a measure of obsessive beliefs in the domain of eating, shape, and weight, and a measure of general eating disorder symptom pathology, refer to Table 18.
Table 18  
**Correlation Matrix for the OBQ-EDV and the EDE-Q for the Entire Sample**  

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<th>10</th>
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</thead>
<tbody>
<tr>
<td>Participants (N = 988)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. OBQ-EDV – Responsibility/Threat</td>
<td>1</td>
<td>.72**</td>
<td>.78**</td>
<td>.78**</td>
<td>.92**</td>
<td>.73**</td>
<td>.75**</td>
<td>.77**</td>
<td>.71**</td>
<td>.81**</td>
</tr>
<tr>
<td>2. OBQ-EDV – Imp/Control of Thoughts</td>
<td>1</td>
<td>.75**</td>
<td>.76**</td>
<td>.89**</td>
<td>.59**</td>
<td>.67**</td>
<td>.66**</td>
<td>.77**</td>
<td>.70**</td>
<td></td>
</tr>
<tr>
<td>3. OBQ-EDV – Perfectionism</td>
<td>1</td>
<td>.75**</td>
<td>.91**</td>
<td>.62**</td>
<td>.71**</td>
<td>.73**</td>
<td>.71**</td>
<td>.75**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. OBQ-EDV – Certainty</td>
<td>1</td>
<td>.89**</td>
<td>.71**</td>
<td>.66**</td>
<td>.67**</td>
<td>.70**</td>
<td>.73**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. OBQ-EDV – Total score</td>
<td>1</td>
<td>.73**</td>
<td>.77**</td>
<td>.79**</td>
<td>.80**</td>
<td>.83**</td>
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<td>6. Restraint</td>
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<td>.69**</td>
<td>.69**</td>
<td>.71**</td>
<td>.83**</td>
<td></td>
<td></td>
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<tr>
<td>7. Weight Concern</td>
<td>1</td>
<td>.93**</td>
<td>.82**</td>
<td>.96**</td>
<td></td>
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<td>8. Shape Concern</td>
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<td>9. Eating Concern</td>
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<td>10. EDE-Q global score</td>
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</tbody>
</table>

*Note.** Correlation is significant at the .001 significance level (2-tailed).
Higher than expected correlations emerged between the OBQ-EDV and the EDE-Q, with all correlations exceeding .60 and the majority exceeding .70. The strongest correlations were between the Responsibility/Threat Estimation subscale and the EDE-Q subscales, namely Weight Concern, Shape Concern, and Restraint. Intolerance of Uncertainty was most closely related to Restraint and Eating Concern, whilst the Importance/Control of Thoughts subscale demonstrated its strongest correlation with the Eating Concern subscale. The OBQ-EDV total score demonstrated a very high correlation with the EDE-Q global score, which is a profound result since the EDE-Q is a quasi self-report diagnostic measure that is frequently used in clinical settings to provide convergent evidence and aid clinicians with diagnosis and diagnostic classification (Mond et al., 2004b).

To obtain a measure of the criterion validity of the OBQ-EDV with a general symptom measure of OCD, correlations between the OBQ-EDV and the OCI-R were computed and are displayed in Table 19.
Table 19

*Correlation Matrix for the OBQ-EDV and the OCI-R for the Entire Sample*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
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<tbody>
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<td></td>
</tr>
<tr>
<td>1. OBQ-EDV – Responsibility/Threat</td>
<td>1</td>
<td>.72**</td>
<td>.78**</td>
<td>.78**</td>
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<td>.29**</td>
<td>.31**</td>
<td>.42**</td>
<td>.30**</td>
<td>.30**</td>
<td>.41**</td>
</tr>
<tr>
<td>2. OBQ-EDV – Imp/Control of Thoughts</td>
<td>1</td>
<td>.75**</td>
<td>.76**</td>
<td>.89**</td>
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<td>.37**</td>
<td>.51**</td>
<td>.35**</td>
<td>.41**</td>
<td>.51**</td>
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<tr>
<td>3. OBQ-EDV – Perfectionism</td>
<td>1</td>
<td>.75**</td>
<td>.91**</td>
<td>.35**</td>
<td>.36**</td>
<td>.50**</td>
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<td>.36**</td>
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<tr>
<td>4. OBQ-EDV – Certainty</td>
<td>1</td>
<td>.89**</td>
<td>.35**</td>
<td>.33**</td>
<td>.34**</td>
<td>.46**</td>
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<td>.38**</td>
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<tr>
<td>5. OBQ-EDV – Total score</td>
<td>1</td>
<td>.36**</td>
<td>.37**</td>
<td>.38**</td>
<td>.52**</td>
<td>.36**</td>
<td>.40**</td>
<td>.52**</td>
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<td>6. Washing</td>
<td>1</td>
<td>.50**</td>
<td>.57**</td>
<td>.46**</td>
<td>.35**</td>
<td>.58**</td>
<td>.73**</td>
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<td>7. Checking</td>
<td>1</td>
<td>.57**</td>
<td>.47**</td>
<td>.53**</td>
<td>.53**</td>
<td>.79**</td>
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<td>8. Ordering</td>
<td>1</td>
<td>.49**</td>
<td>.45**</td>
<td>.55**</td>
<td>.80**</td>
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<td>9. Obsession</td>
<td>1</td>
<td>.51**</td>
<td>.51**</td>
<td>.77**</td>
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<td>10. Hoarding</td>
<td>1</td>
<td>.42**</td>
<td>.73**</td>
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<td>11. Mental Neutralisation</td>
<td>1</td>
<td>.76**</td>
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<td>12. OCI-R total score</td>
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*Note.* ** Correlation is significant at the .001 significance level (2-tailed).
Unlike the EDE-Q, correlations between the OBQ-EDV and OCI-R were only moderate in strength. All OBQ-EDV subscales were most highly correlated with the Obsession subscale of the OCI-R. Relative to other correlations in Table 18, the relationship between Importance/Control of Thoughts and Mental Neutralisation was also higher in magnitude. The Responsibility/Threat Estimation subscale of the OBQ-EDV demonstrated weaker combinations with the OCI-R subscales when compared with the other OBQ-EDV subscales. The strength of the correlation between the OBQ-EDV and the OCI-R total scores indicates a balance between shared and unique variance, and a combination of convergent and discriminant criterion validity.

With regard to the relationship between domain specific obsessive beliefs on the OBQ-EDV and body checking behaviours and cognitions, the OBQ-EDV subscales were correlated with the BCQ and the BCCS, refer to Table 20.
Table 20

*Correlation Matrix for the OBQ-EDV, the BCCS, and the BCQ for the Entire Sample*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
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</thead>
<tbody>
<tr>
<td>1. Responsibility/Threat</td>
<td>1</td>
<td>.72*</td>
<td>.78*</td>
<td>.78*</td>
<td>.92*</td>
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<td>.72*</td>
<td>.47*</td>
<td>.66*</td>
<td>.71*</td>
<td>.74*</td>
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<tr>
<td>2. Imp/Control of Thoughts</td>
<td>1</td>
<td>.75*</td>
<td>.76*</td>
<td>.89*</td>
<td>.58*</td>
<td>.62*</td>
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<td>.38*</td>
<td>.64*</td>
<td>.57*</td>
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<tr>
<td>3. Perfectionism</td>
<td>1</td>
<td>.75*</td>
<td>.91*</td>
<td>.72*</td>
<td>.70*</td>
<td>.63*</td>
<td>.74*</td>
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<td>.71*</td>
<td>.65*</td>
<td>.72*</td>
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<tr>
<td>4. Intolerance of Uncertainty</td>
<td>1</td>
<td>.89*</td>
<td>.66*</td>
<td>.65*</td>
<td>.60*</td>
<td>.68*</td>
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<td>.69*</td>
<td>.72*</td>
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<td>5. OBQ-EDV total score</td>
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<td>.72*</td>
<td>.72*</td>
<td>.66*</td>
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<td>.72*</td>
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<td>6. Appearance</td>
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<td>.85*</td>
<td>.75*</td>
<td>.95*</td>
<td>.75*</td>
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<td>7. Specific Body Parts</td>
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<td>8. Idiosyncratic Checking</td>
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<td>9. BCQ total score</td>
<td>1</td>
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<td>.53*</td>
<td>.75*</td>
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<td>10. Objective Verification</td>
<td>1</td>
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<td>.76*</td>
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<td>11. Reassurance</td>
<td>1</td>
<td>.61*</td>
<td>.73*</td>
<td>.81*</td>
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<td>12. Safety Beliefs</td>
<td>1</td>
<td>.74*</td>
<td>.88*</td>
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<td>13. Body Control</td>
<td>1</td>
<td>.92*</td>
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<td>14. BCCS total score</td>
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Note. ** Correlation is significant at the .001 significance level (2-tailed).
OBQ-EDV subscales were most strongly related to the Appearance and Specific Body Parts subscales of the BCQ when compared with the Idiosyncratic Checking subscale. Perfectionism emerged as the domain specific obsessive belief that has the strongest correlations with body checking behaviour, whilst Importance/Control of Thoughts maintained the weakest correlations. The OBQ-EDV demonstrated a strong overall correlation with the BCQ total score. Higher correlations than those obtained were expected for the OBQ-EDV and the BCCS, since both scales examine cognitive constructs associated with eating pathology. Surprisingly, the correlation between the OBQ-EDV and the BCCS total scores was highly comparable to that of the OBQ-EDV and the BCQ. The OBQ-EDV subscales and total score were more strongly related to the Objective Verification, Safety Beliefs, and Body Control subscales when compared with the Reassurance subscale. Of all the OBQ-EDV subscales, Responsibility/Threat Estimation had the strongest correlations with the Objective Verification and Body Control subscale, however the strongest correlation with the Safety Beliefs subscale lied with beliefs about Perfectionism.

In regards to general measures of psychopathology, the OBQ-EDV total score was also found to be moderately correlated with the Depression \( (r = .57, p < .001) \), Anxiety \( (r = .51, p < .001) \), and Stress \( (r = .53, p < .001) \) subscales of the DASS-21, and was found to be strongly correlated with the Rosenberg Self-Esteem Scale \( (r = .70, p < .001) \). Clinical perfectionism also warranted attention given that perfectionism is common among the eating disorder and OCD research literature, and is also a subscale within the OBQ-EDV. Scores on the OBQ-EDV were therefore correlated with the MPS-F total score. The MPS-F total score was most strongly correlated with the Perfectionism subscale of the OBQ-EDV \( (r = .65, p < .001) \) when compared with the Responsibility/Threat Estimation \( (r = .53, p < .001) \), Importance/Control of Thoughts \( (r = .53, p < .001) \), and Intolerance of Uncertainty subscales \( (r = .53, p < .001) \). Based on this finding, the Perfectionism subscale of the OBQ-EDV was correlated with the MPS-
F subscales. OBQ-EDV Perfectionism was most strongly associated with the Concern Over Mistakes subscale \( (r = .71, p < .001) \), followed by Doubts About Actions \( (r = .60, p < .001) \), Personal Standards \( (r = .42, p < .001) \), Parental Criticisms \( (r = .42, p < .001) \), Parental Expectations \( (r = .33, p < .001) \), and Organisation \( (r = .22, p < .001) \).

**Construct Validity.** Principal Axis factor analyses have provided evidence for a four-factor model of the OBQ-EDV. The finding that this factor structure is largely consistent with that of the OBQ-44 suggests that these two measures examine similar underlying constructs, that being obsessive beliefs. High correlations between the OBQ-EDV and measures of eating pathology suggest that this measure also taps into cognitive styles that are associated with eating disorders. Intercorrelations between the OBQ-EDV subscales validate the non-orthogonal approach to factor analysis, and the strength of these relationships suggests that the OBQ-EDV examines several obsessive belief domains with regard to overvaluing the importance of thoughts, controlling thoughts, overestimating threat and responsibility, and the need to prevent uncertainty and aspire to perfection. That is, while these domains appear to measure a single underlying obsessive belief construct, a variety of sub-domains can also be distinguished.

**Discussion**

The aim of the present study was to evaluate the psychometric properties of the newly developed OBQ-EDV. The OBQ-EDV builds on research conducted by the OCCWG (1997, 2001, 2003, 2005) by evaluating obsessive beliefs measured by the OBQ-44 in the domain of eating, shape, and weight. Whilst self-report assessments of eating pathology such as the EDE-Q, EDI, and EAT-26 also evaluate eating disorder attitudes, beliefs, and behaviours, these measures have a focus on the symptom presentation and diagnostic criteria of AN, BN, and EDNOS (Garner & Garfinkel, 1979; Fairburn & Beglin, 1994; Mond et al., 2004b). The OBQ-EDV is thought to add to the assessment of these disorders by providing an evaluation of thought processes that
are prominent in OCD whilst tapping into the domain that is most salient to eating disorders.

**Factor Structure of the OBQ-EDV**

The factor structure of the OBQ-EDV was largely consistent with that of the OBQ-44. Specifically, items loaded on a Responsibility/Threat Estimation subscale, an Importance/Control of Thoughts subscale, a Perfectionism subscale, and an Intolerance of Uncertainty Subscale. Items loading on separate Perfectionism and Intolerance of Uncertainty factors may suggest that these two obsessive belief domains tap into independent constructs in the context of eating disorders. Examination of item content for these two subscales indicates that perfectionism items relate to the struggle to attain a specific goal, that being a target weight or ideal body shape. The Intolerance of Uncertainty subscale requests information about the distress and anxiety experienced when detailed information is not provided about food content, or when the consequences of eating a certain food are unknown or ambiguous.

Identifying independent factors for Perfectionism and Intolerance of Uncertainty is partially consistent with the findings of other studies that have re-examined the factor structure of the OBQ-44 (Myers et al., 2008; Woods et al., 2004). In Woods and colleagues’ (2004) psychometric validation of the OBQ-44, Perfectionism was found to load on a single factor, whilst Intolerance of Uncertainty items loaded on a general factor consisting of a combination of all six obsessive belief domains. Contrary to the current findings, Myers and colleagues (2008) reported that among a community sample of university students, Perfectionism and Intolerance of Uncertainty loaded on a combined factor, a finding that is consistent with the original psychometric analysis of the OBQ-44 by the OCCWG (2005). The findings of these studies must be taken in the context of their focus on anxiety disorders, namely OCD, and the use of student samples. Although Perfectionism and Intolerance of Uncertainty fall under the same obsessive belief umbrella in the context of OCD, it is plausible that the association
between Perfectionism and Intolerance of Uncertainty does not extend to the domain of eating, shape, and weight. Whilst the intercorrelation between the Perfectionism and Intolerance of Uncertainty subscale was strong, its magnitude was comparable to that of the other OBQ-EDV subscales, thus Perfectionism and Intolerance of Uncertainty did not reveal a relationship that was distinctively strong when compared with associations between other OBQ-EDV subscales.

Items pertaining to Responsibility and Threat Estimation loaded on the same factor, which provides further validation for the conceptualisation of the Responsibility/Threat Estimation subscale as a single dimension. This coincides with the Importance of Thoughts and Control of Thoughts domains loading on a single factor. To find that associations between these types of obsessive beliefs is maintained in the eating, shape, and weight domain suggests a robust link between these belief systems. Theoretically, it might be assumed that if a woman overvalues the importance of a thought about her diet or the amount that she has eaten, or she perceives that having a thought alone is equivalent to an event or behaviour associated with the thought, then the likelihood of trying to exert some control of the thought may increase. Whilst consistent with the theoretical framework underlying Thought-Shape Fusion (TSF) (Shafran et al., 1999; Shafran & Robinson, 2004), this notion suggests that at least a proportion of thoughts associated with disordered eating are intrusive (and therefore must be controlled, suppressed, or eliminated), which is contrary to the suggestion that beliefs surrounding disordered eating are for the most part, ego-syntonic (Shafran et al., 2004).

Several items within the OBQ-EDV were found to load on multiple factors or on factors other than those they were theoretically designed to measure. The item "I must keep working on my weight until it is just right" was found to load exclusively on the Responsibility/Threat Estimation subscale rather than Perfectionism. In reviewing this item, the terminology ‘just right’ denotes perfectionism, however the wording “I must"
suggests responsibility on the part of the respondent. The term “must” may also be associated with an overestimation of threat as it implies an adverse consequence if the behaviour is not carried out. In effect, whilst this item was devised to measure perfectionism, the wording used to phrase the item may have precluded it from measuring this obsessive belief in isolation.

The item “When I see an opportunity to do so, I must act to prevent weight gain” was found to load on the Intolerance of Uncertainty subscale rather than the predicted Responsibility/Threat Estimation subscale. On reviewing this item, participants may have interpreted that a negative consequence will arise if an “opportunity” to avoid weight gain is not taken. Subsequently, this relates to an intolerance of uncertainty given that not taking an opportunity to prevent a perceived harm may be met with an increased risk that the harmful consequence may result, and thus greater uncertainty that weight gain will not be prevented.

Three items did not have a sufficient loading on any of the four OBQ-EDV factors. These included the Intolerance of Uncertainty item, “If I am not absolutely sure of what I eat, I’m bound to put on weight” (Item 8), and Responsibility/Threat Estimation items, “Even eating small amounts of food increases the risk of weight gain” (Item 21) and “Even if gaining weight is very unlikely, I should try to prevent it at any cost” (Item 19). Items 8 and 21 demonstrated small factor loadings on the Responsibility/Threat Estimation and the Importance/Control of Thoughts subscales. This is intriguing given that there is no reference to thought processes or cognition in either of the items. This is particularly surprising for Item 21 given that there is an explicit statement about a behaviour, that is, eating small amounts of food, yet of all the subscales, this item loaded on the principal thought-based subscale. All items that loaded on multiple factors, or those that loaded on factors other than their theoretically derived content area, were omitted from the OBQ-EDV, resulting in a 25-item measure. In summary, with the exception of the Perfectionism and Intolerance of Uncertainty subscales
loading on individual factors and a select number of items loading on multiple factors or those that differed from what had been theorised, the current findings suggest that the factor structure of a domain specific measure of obsessive beliefs is largely consistent with that proposed by the OCCWG (2005).

**Reliability of the OBQ-EDV**

High internal consistency with regards to Cronbach’s alpha coefficient was obtained for all OBQ-EDV subscales and the OBQ-EDV total score. This was encouraging given that the measure contains a range of cognitive and behaviourally-based item content across the eating, shape, and weight domains of disordered eating. Item analysis indicated that the majority of items contributed to the overall alpha coefficient for each subscale, a finding that is to be expected based on the small number of items comprising each individual subscale. Two items within the Importance/Control of Thoughts subscale were found to slightly impinge on the Cronbach’s alpha coefficient for this subscale. On the basis that the removal of these items would result in only a modest increase in Cronbach’s alpha, it was decided that these two items remain in the scale. The size of the OBQ-EDV subscales was also considered in this decision, as unnecessary omission of items may limit the detailed measurement of obsessive beliefs and pose questions in relation to the content validity of the scale. The two items in question were also found to contribute to the overall alpha for the OBQ-EDV total score, and thus removing these items would have reduced the reliability of the total score.

Although the OBQ-44 and the OBQ-EDV are relatively independent scales, comparison of internal consistency is warranted given the use of re-worded items within the newly developed measure. Internal consistency across the two questionnaires was highly comparable, with the OCCWG (2005) reporting alpha coefficients in the range of .89 to .93 for the OBQ-44 subscales, and an overall alpha of .95 for the total score. This compares to coefficients of .84 to .89 for the OBE-DEV
subscales and an overall alpha of .94 for the OBQ-EDV total score. Internal reliability estimates for the OBQ-EDV were slightly lower than their equivalent subscales on the OBQ-44. This was unexpected given that the OBQ-44 is a general measure of obsessive beliefs while the OBQ-EDV considers one particular domain, that being eating, shape, and weight concerns.

**Intercorrelations of the OBQ-EDV Subscales**

Intercorrelations were found to be high for the four OBQ-EDV subscales, ranging from .72 to .78 for the entire sample. Intercorrelations were moderate when limited to women with an eating disorder, ranging from .52 to .62. This is consistent with the findings of the OCCWG (2005), whereby higher intercorrelations were found for participants with OCD, when compared with intercorrelations incorporating other clinical groups or student controls. The strength of intercorrelations is an area that has attracted criticism in the development and psychometric validation of the OBQ-44, with researchers expressing concern about the difficulty distinguishing between obsessive beliefs when the relationship between subscales remains strong (Woods et al., 2004).

In the case of the OBQ-EDV, high intercorrelations may have at least partially resulted from overlap with regards to eating, shape, and weight concerns. This is supported by the strong correlations between the OBQ-EDV and the EDE-Q subscales, which were higher than expected. Examination of item content suggests that the OBQ-EDV examines obsessive beliefs across all EDE-Q domains, including Restraint (“I must restrict my diet to avoid putting on weight”), Weight Concern (“Failing to prevent gaining weight is just as bad as deliberately gaining weight”), Shape Concern (“My body shape should be perfect according to my own standards”), and Eating Concern (“For me, having bad urges to eat is as bad as actually eating”). It is not uncommon for two measures of eating pathology to demonstrate such high overlapping variance (as demonstrated by Mountford et al., 2006 and Reas et al., 2002). In the psychometric analysis of the BCCS, Mountford and colleagues (2006) reported correlations with the
BCQ subscales in the realms of .50 to .73 for the eating disorder sample, with regression analyses revealing high associations between the BCCS and the EDE-Q. In validating the BCQ, Reas and colleagues (2002) found that the BCQ subscales were highly correlated with the Body Shape Questionnaire, the Body Checking and Avoidance Scale, and the EAT-26. In effect, whilst it is imperative that newly developed assessments provide at least partially unique information to that of other measures, correlations of moderate to high magnitude appear common when the content areas of the items overlap.

**Validity of the OBQ-EDV**

Although the strength of correlations between the EDE-Q and the OBQ-EDV validates the content and criterion validity of this measure, a core difference between the OBQ-EDV and general symptom measures of eating disorders (e.g., EDE-Q, EDI, and EAT-26) lies in the focus that symptom measures place on diagnostic criteria and the presence or absence of disordered eating behaviour. The OBQ-EDV examines thinking styles and cognitive beliefs that are associated with OCD and are likely to have a role in precipitating and maintaining disordered eating behaviour. As a measurement tool, the OBQ-EDV represents an amalgamation of obsessive beliefs associated with anxiety disorders, and attitudes and beliefs that are characteristic of eating disorders.

Further evidence for the criterion validity of the OBQ-EDV was provided by correlations between this measure and the OBQ-44. Correlations of moderate strength were identified, with the strongest correlations typically occurring between subscales that measured the same obsessive beliefs domain (e.g., Importance/Control of Thoughts on the OBQ-44 and Importance/Control of Thoughts on the OBQ-EDV). This occurred for all subscales aside from Responsibility/Threat Estimation on the OBQ-EDV, which had its strongest correlation with the Perfectionism/Intolerance of Uncertainty subscale of the OBQ-44. Of note, the OCCWG (2005) found that Responsibility/Threat Estimation had its strongest intercorrelation with the
Perfectionism/Intolerance of Uncertainty subscale of the OBQ-44, which provides evidence for a strong relationship between these two domains.

The OBQ-EDV correlated moderately with the OCI-R subscales, the greatest of which was between the Obsession subscale and the OBQ-EDV total score. This is consistent with the OBQ-EDV being a measure of obsessive elements of disordered eating, and also coincides with the findings of the OCCWG (2005), whereby the OBQ-44 total score was found to correlate most highly with the harm thoughts subscale of the Padua Inventory. The OBQ-EDV Perfectionism subscale correlated strongly with the MPS-F total score, which is consistent with correlational research comparing the MPS-F with other perfectionism measures such as the MPS-H, the Burns Perfectionism Scale, and the Perfectionism subscale of the EDI (Bastiani et al., 1995; Frost et al., 1990). The Perfectionism subscale of the OBQ-EDV was most highly correlated with the Concerns Over Mistakes and Doubts About Actions subscales of the MPS-F, a finding that is consistent with previous research. Specifically, Bulik and colleagues (2003) reported that eating disorder symptoms are most clearly associated with Concerns Over Mistakes and Doubts About Actions on the MPS-F.

A recurring trend was that scores on the OBQ-EDV had stronger correlations with the measures of eating disorders than measures of anxiety and OCD. This finding suggests that the content of the OBQ-EDV is more closely aligned to eating disorder symptomatology than OCD. It is possible that this finding is a consequence of the domain-specific nature of the OBQ-EDV, as items within the measure appear more relevant to women who are currently experiencing disordered eating symptoms, whilst a general measure such as the OBQ-44 would be salient to respondents experiencing obsessive beliefs in any domain. To illustrate, consider an individual who is experiencing recurrent intrusive thoughts regarding harm to others due to the threat of contamination. Whilst items reflecting aggressive obsessions, inflated responsibility, and a desire for cleanliness would be relevant to this individual's presentation, fear
associated with weight gain, a need for perfectionism in relation to body shape, or beliefs about the consequences of thoughts surrounding food are unlikely to trigger the same distress and anxiety. As such, it is plausible that women who have high scores on the OBQ-EDV also have elevated scores on the OBQ-44. However, elevated scores on the OBQ-44 would not necessarily coincide with heightened obsessive beliefs on the OBQ-EDV, particularly if eating, shape, and weight is not a domain associated with their obsessions.

Conclusion

In conclusion, this study has reported on a new measure that was developed to evaluate domain specific obsessive beliefs in the context of eating disorders. Results have indicated that a factor structure that is largely consistent with the OBQ-44 is evident for the OBQ-EDV, aside from the Perfectionism and Intolerance of Uncertainty subscales loading on independent factors. Item analysis and internal consistency coefficients yielded encouraging results, with intercorrelations between subscales being in the realms of those reported for the OBQ-44. Preliminary investigation of the face, content, criterion-related, and construct validity of the OBQ-EDV is also encouraging. It is hoped that this measure will provide researchers and practitioners alike with an assessment tool that taps into obsessive-compulsive cognitions as they apply to eating disorders. In the next study, scores on the OBQ-EDV will be examined across clinical and community control groups, in order to evaluate group-based differences on the OBQ-EDV. Regression analyses will also enable measurement of the strength of domain specific obsessive beliefs in predicting eating disorder symptoms.
Chapter 10
Study 4: Analysis of Clinical and Non-Clinical Group Differences on the Obsessive Beliefs Questionnaire – Eating Disorder Version (OBQ-EDV)

The aim of Study 4 was to evaluate scores on the OBQ-EDV across eating disorder, OCD, and depression groups, and compare clinical group scores on this measure with community controls. Differences in eating, shape, and weight specific obsessive beliefs were also examined across women with AN and BN, in addition to evaluating the greatest predictors of eating disorder symptoms with respect to both general and domain specific obsessive-compulsive cognitions. Research questions to be addressed in this study include:

1. Are there differences in obsessive beliefs on the OBQ-EDV when comparing women with eating disorders to those with OCD or depression?
2. Are there differences in obsessive beliefs on the OBQ-EDV across eating disorder diagnostic categories?
3. Do obsessive beliefs in the domain of eating, shape, and weight mediate the relationship between general obsessive beliefs and eating disorder symptoms measured by the EDE-Q?
4. Are women who score in the highest quartile on a measure of general obsessive beliefs more likely to score in the highest quartile on a measure of eating, shape, and weight specific obsessive beliefs and vice versa?

Method

Please refer to the general Method section reported in Chapter 5 for a detailed summary of the sample of participants, measures, and procedures used in this study.

Results

Clinical and Non-Clinical Group Comparison on the OBQ-EDV

Differences in eating, shape, and weight specific obsessive beliefs were examined across eating disorder, OCD, and depressed groups, with participants with
no diagnostic history also being compared with these clinical groups. Analysis of the homogeneity of variance assumption across the groups indicated unequal variances. Subsequent attempts to correct this violation using data transformations were unsuccessful. Therefore, a Kruskal-Wallis non-parametric procedure was employed to analyse this data. Post-hoc testing consisted of a series of Mann-Whitney tests with Bonferroni adjusted alpha levels ($\alpha = 0.008$). Table 21 displays mean and standard deviation scores for the comparison groups on the OBQ-EDV subscales and total score. Results of the Kruskal-Wallis test with coinciding post-hoc comparisons with Bonferroni adjusted alpha levels are also displayed.
Table 21

Mean and Standard Deviation Scores on the OBQ-EDV Across the Clinical and Community Control Groups

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ED (n = 77)</th>
<th>OCD (n = 19)</th>
<th>DC (n = 48)</th>
<th>CC (n = 317)</th>
<th>Entire sample (n = 988)</th>
<th>H(df=3)</th>
<th>Post-hoc comparisons¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resp/Threat</td>
<td>42.85 (7.61)</td>
<td>37.26 (10.63)</td>
<td>40.07 (9.57)</td>
<td>20.14 (9.48)</td>
<td>30.89 (12.25)</td>
<td>227.35**</td>
<td>3</td>
</tr>
<tr>
<td>Imp/Control</td>
<td>31.97 (10.31)</td>
<td>22.58 (11.57)</td>
<td>28.31 (11.6)</td>
<td>12.79 (6.46)</td>
<td>19.61 (10.88)</td>
<td>197.39**</td>
<td>1, 3</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>34.97 (8.05)</td>
<td>25.37 (9.49)</td>
<td>30.15 (9.39)</td>
<td>13.12 (6.82)</td>
<td>21.31 (11.05)</td>
<td>222.85**</td>
<td>1, 3</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>21.87 (6.47)</td>
<td>18.79 (8.06)</td>
<td>16.23 (7.84)</td>
<td>8.25 (4.72)</td>
<td>13.32 (7.29)</td>
<td>181.53**</td>
<td>2, 3</td>
</tr>
<tr>
<td>OBQ-EDV total</td>
<td>131.67 (28.10)</td>
<td>103.99 (33.68)</td>
<td>114.75 (32.31)</td>
<td>54.30 (23.56)</td>
<td>85.13 (37.50)</td>
<td>236.38**</td>
<td>1, 2, 3</td>
</tr>
</tbody>
</table>

Note. ¹ Sig. post-hoc comparisons: 1: ED>OCD, 2: ED>DC, 3: ED, OCD, DC>CC. **p < .001.
As shown, group differences emerged for each OBQ-EDV subscale and the OBQ-EDV total score. Women with an eating disorder, OCD, or depression scored significantly higher on all OBQ-EDV subscales when compared with the community control group. Women with an eating disorder had significantly higher scores on the Importance/Control of Thoughts and Perfectionism subscales of the OBQ-EDV when compared with women with OCD. However, there were no significant differences between the eating disorder and OCD groups on the Responsibility/Threat Estimation or Intolerance of Uncertainty subscales. Women with an eating disorder had significantly higher scores on the Intolerance of Uncertainty subscale when compared with women with depression. The eating disorder group had significantly higher OBQ-EDV total scores when compared with the OCD and depression groups. Women with depression had marginally higher scores on most OBQ-EDV subscales when compared with their counterparts with OCD, however no significant differences emerged between these two groups.

Non-parametric effect size estimates ($\theta$) with respect to each post-hoc comparison are displayed in Figure 14. Consistent with the findings of the significance tests, large effect sizes were found when comparing either clinical group (eating disorder, OCD, depression) with the community control group. Medium to large effects were found when comparing the eating disorder group with the OCD group, with the largest effects being for the Importance/Control of Thoughts and Perfectionism subscales. Effect size estimates for the eating disorder and depression comparisons were in the small to medium range, with the largest effect sizes being for the Intolerance of Uncertainty and Perfectionism subscales respectively.
Figure 14. Effect size for the Mann-Whitney U post-hoc test with corresponding 95% confidence interval error bars for the four comparison groups across the OBQ-EDV subscales and total score. The smaller the magnitude of effect size $\theta$, the larger the effect, with effect sizes of 0.5 indicating no effect and 0.0 indicating maximum effect.
Comparison of Eating Disorder Diagnostic Categories on the OBQ-EDV

The finding that scores on the OBQ-EDV were significantly higher among the eating disorder group provides a rationale to compare differences in scores on the OBQ-EDV across the various types of eating disorders. Table 22 displays mean and standard deviation scores on the OBQ-EDV across the eating disorder diagnostic categories.

Table 22

<table>
<thead>
<tr>
<th>Subscale</th>
<th>AN (n = 26)</th>
<th>BN (n = 15)</th>
<th>EDNOS (n = 8)</th>
<th>Unspecified ED (n = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resp/Threat</td>
<td>43.42 (9.31)</td>
<td>42.80 (6.03)</td>
<td>44.88 (3.64)</td>
<td>45.00 (9.75)</td>
</tr>
<tr>
<td>Imp/Control</td>
<td>34.15 (11.00)</td>
<td>29.86 (8.42)</td>
<td>34.88 (8.25)</td>
<td>39.38 (9.41)</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>35.42 (7.97)</td>
<td>36.33 (5.67)</td>
<td>37.25 (3.54)</td>
<td>36.63 (12.05)</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>24.19 (6.09)</td>
<td>21.40 (5.03)</td>
<td>23.88 (4.45)</td>
<td>24.38 (5.34)</td>
</tr>
<tr>
<td>OBQ-EDV total</td>
<td>137.19 (30.86)</td>
<td>130.39 (19.23)</td>
<td>140.88 (16.54)</td>
<td>145.38 (35.34)</td>
</tr>
</tbody>
</table>

Analysis of descriptive statistics indicates largely consistent scores on the OBQ-EDV across the eating disorder groups, with the unspecified eating disorder and EDNOS groups having marginally higher scores, particularly on the OBQ-EDV total score. Due to the small sample size of women with EDNOS or an unspecified eating disorder, group based analyses were limited to comparing women with AN to those with BN. A series of independent samples t-tests with Bonferroni adjusted alpha levels (α = .01) were conducted for each OBQ-EDV subscale and the OBQ-EDV total score. Results indicated that there were no significant differences between the AN and BN groups on Responsibility/Threat Estimation, t(39) = 0.23, p = .82, d = 0.07 (-0.56, 0.71); Importance/Control of Thoughts, t(39) = 1.31, p = .20, d = 0.42 (-0.22, 1.06);
Perfectionism, \( t(39) = -0.39, p = .70, d = 0.13 \) (-0.51, 0.76); or Intolerance of Uncertainty subscales, \( t(39) = 1.50, p = .14, d = 0.49 \) (-0.16, 1.13); or on the OBQ-EDV total score, \( t(39) = 0.77, p = .45, d = 0.25 \) (-0.39, 0.89). Effect sizes of small to medium strength were found for the Importance/Control of Thoughts and Intolerance of Uncertainty subscales, indicating that the lack of significance may have been at least partially the result of sample size.

**Mediational Analysis of Eating, Shape, and Weight Specific Obsessive Beliefs**

Hierarchical regression analyses were conducted to examine whether obsessive beliefs in the domain of eating, shape, and weight predicted general eating disorder behaviours and attitudes over and above the predictive power generated by general obsessive beliefs on the OBQ-44. To achieve this, five separate regressions were conducted, with one of the four EDE-Q subscales (Restraint, Weight Concern, Shape Concern, Eating Concern) and the EDE-Q global score being entered as the dependent variable in each respective analysis. The moderate to strong correlations between both obsessive belief measures (the OBQ-44 and OBQ-EDV) and the EDE-Q (refer to Chapter 8 and Chapter 9) provide support for the inclusion of these variables as predictors in the regression. This model of analysis will explore the discriminant criterion validity of the OBQ-EDV in addition to addressing whether eating, shape, and weight specific obsessive beliefs mediate the relationship between general obsessive beliefs and eating disorder symptoms. Refer to Figure 15 for a pictorial example of the regression analysis.
Independent Variable

- General obsessive beliefs as measured by the OBQ-44

Mediator

- Eating, shape, and weight specific obsessive beliefs as measured by the OBQ-EDV

Dependent Variables

- Restraint
- Weight concern
- Shape concern
- Eating concern
- Global EDE-Q

*Figure 15.* Example of the proposed mediation of domain-specific obsessive beliefs in the relationship between general obsessive beliefs and eating disorder symptomatology.

The OBQ-44 total score was entered as a predictor in the first step of each regression analysis, with the OBQ-EDV subscales being entered as a block in the second step alongside the OBQ-44 total score. Results of the regression analyses are displayed in Table 23.
<table>
<thead>
<tr>
<th>Predictor</th>
<th>Restraint</th>
<th>Weight concern</th>
<th>Shape concern</th>
<th>Eating concern</th>
<th>Global score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
<td>$\Delta R^2$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>OBQ-44 total score</td>
<td>.46**</td>
<td>.21**</td>
<td>.50**</td>
<td>.25**</td>
<td>.52**</td>
</tr>
<tr>
<td>OBQ-EDV Resp/Threat</td>
<td>.46**</td>
<td>.43**</td>
<td>.46**</td>
<td>.20**</td>
<td>.49**</td>
</tr>
<tr>
<td>OBQ-EDV Imp/Cont of Thou</td>
<td>.01</td>
<td>.21**</td>
<td>.14**</td>
<td>.44**</td>
<td>.14**</td>
</tr>
<tr>
<td>OBQ-EDV Perfectionism</td>
<td>.03</td>
<td>.27**</td>
<td>.30**</td>
<td>.16**</td>
<td>.24**</td>
</tr>
<tr>
<td>OBQ-EDV Uncertainty</td>
<td>.36**</td>
<td>.02</td>
<td>.02</td>
<td>.11*</td>
<td>.12**</td>
</tr>
</tbody>
</table>

*Note. *$p < .05. **p < .001.*
Beta weights and corresponding $p$-values indicate that the OBQ-44 was a strong significant predictor of attitudes and behaviours on all EDE-Q subscales in Step 1 of the regression analyses. However, general obsessive beliefs were no longer predictive of eating disorder symptoms following the inclusion of the OBQ-EDV subscales, with Beta weights for the OBQ-44 reducing to almost zero following inclusion of the OBQ-EDV subscales. This finding indicates that eating, shape, and weight specific obsessive beliefs mediate the relationship between general obsessive beliefs and eating disorder symptoms. Each OBQ-EDV subscale accounted for a significant proportion of unique variance in predicting at least one EDE-Q domain. Responsibility/Threat Estimation and Intolerance of Uncertainty were significant predictors of Restraint, whilst Responsibility/Threat Estimation, Importance/Control of Thoughts, and Perfectionism predicted Weight Concern. Shape Concern was significantly predicted by Importance/Control of Thoughts, Responsibility/Threat Estimation, and Perfectionism. Finally, all four subscales were significant predictors of Eating Concern, with Importance/Control of Thoughts being the greatest predictor. All four OBQ-EDV subscales also accounted for a significant proportion of unique variance in predicting scores on the EDE-Q global score, with Responsibility/Threat Estimation demonstrating the highest Beta weight.

To further evaluate this mediation effect and the relationship between general obsessive beliefs and those specific to disordered eating attitudes, quartile splits were used to cluster participants into low and high groups on the OBQ-44 and OBQ-EDV. The aim of this analysis was to identify whether any participants scored in the highest quartile on the OBQ-EDV and in the lowest quartile on the OBQ-44. Scores of this nature would indicate that domain specific obsessive beliefs operate independently of general obsessional thinking. Table 24 displays the frequency of participants that were clustered into each category.
Table 24

*Crosstabulation of Participants Categorised into the First and Fourth Quartiles of the OBQ-EDV and the OBQ-44*

<table>
<thead>
<tr>
<th>OBQ-EDV</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Quartile</th>
<th>4&lt;sup&gt;th&lt;/sup&gt; Quartile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBQ-44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Quartile</td>
<td>195</td>
<td>5</td>
<td>200</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; Quartile</td>
<td>3</td>
<td>164</td>
<td>167</td>
</tr>
<tr>
<td>Total</td>
<td>198</td>
<td>169</td>
<td>367</td>
</tr>
</tbody>
</table>

Very few participants \(n = 8\) or 2.2%) scored in the highest quartile on one measure of obsessive beliefs and in the lowest quartile on the other. To illustrate, of the 200 participants who scored in the lowest quartile on the OBQ-44, only 5 scored in the highest quartile on the OBQ-EDV. Similarly, of the 198 women who scored in the lowest quartile on the OBQ-EDV, only 3 scored in the highest quartile on the OBQ-44.

**Discussion**

The aim of the current study was to extend on previous literature that has examined differences in general obsessive beliefs across clinical groups and community based samples (Humphreys et al., 2007; Lavender et al., 2006; Myers et al., 2008; OCCWG, 2003, 2005; Woods et al., 2004). Specifically, obsessive beliefs in the domain of eating, shape, and weight were analysed across clinical and non-clinical groups, with comparisons made with respect to general and domain specific obsessive beliefs across these groups.

**Clinical and Non-Clinical Group Comparison on the OBQ-EDV**

Consistent with analyses incorporating the OBQ-44 (Refer to Study 2), women with an eating disorder, OCD, or depression scored significantly higher than women in
the community control group across all OBQ-EDV subscales and the OBQ-EDV total score. Contrary to the OBQ-44 however, clinical group differences emerged when examining scores on the OBQ-EDV. Women with an eating disorder had significantly higher scores on the Importance/Control of Thoughts and Perfectionism subscales when compared with their OCD counterparts. Given that women with an eating disorder or OCD were equivalent on the Perfectionism subscale of the OBQ-44, it is not surprising that women with an eating disorder have elevated perfectionism when the perfectionistic tendencies being measured are associated with the salient disorder content. This is consistent with studies that have examined perfectionism as it applies to eating disorders, particularly studies that have utilised a measure of perfectionism that is specific to disordered eating (Franco-Paredes et al., 2005; Slade & Dewey, 1986).

Regarding differences on the Importance/Control of Thoughts subscale, it is possible that women with OCD interpret the threat of eating, shape, and weight related thoughts in the context of the threat associated with intrusive thoughts they experience as part of their OCD. Unless the eating, shape, and weight related intrusive thoughts are salient to OCD, it is not likely that thoughts in this domain will elicit the same intensity of distress and anxiety (DeVeaux-Geiss, 1993).

Comparable scores on the Responsibility/Threat Estimation subscale across eating disorder and OCD groups suggest that women with OCD have an inflated sense of responsibility and overestimate threat in eating, shape, and weight domains in a comparable way to women with eating disorders. Whilst theoretical models of OCD would suggest that responsibility beliefs and threat estimations would vary in accordance with the stimuli perceived as threatening (DeVeaux-Geiss, 1993; Gibbs, 1996; Salkovskis et al., 1999), this finding suggests at least partial generalisability of these beliefs to other stimuli. This finding may not be representative of the general population of women with OCD given that women in the OCD group, on average,
reported subclinical levels of disordered eating symptoms, with 71% falling within the broader clinical range (EDE-Q > 2.3; Mond et al., 2004b) and 23% falling well within the conservative clinical range (EDE-Q > 4.0; Fairburn and Beglin, 1994). This may provide a partial explanation as to why responsibility beliefs, threat estimation, and intolerance of uncertainty were overvalued in an eating, shape, and weight domain by women with OCD in the current study.

Women with an eating disorder had significantly higher scores on the OBQ-EDV total score when compared with women with OCD or depression. Whilst previous studies (Lavender et al., 2006; Tolin et al., 2006) and findings of Study 2 indicate that different clinical groups maintain statistically equivalent obsessive beliefs on a general measure, this finding does not generalise to a more narrow content area, in this case the domain of eating, shape, and weight. It is evident that whilst some overlap exists within the Responsibility/Threat Estimation and Intolerance of Uncertainty subscales, differences are more profound when examining a total score that captures all obsessive beliefs. It appears that eating, shape, and weight specific obsessive beliefs are experienced more frequently and severely among women with an eating disorder when compared with women with OCD or depression. This is consistent with the notion that whilst eating disorders and OCD share similarities in cognitive content, distinguishable characteristics are evident when comparing these disorders (Bastiani et al., 1996; Godart, Berthoz, Perdereau, & Jeammet, 2006a; Thiel et al., 1998). It would be valuable to examine whether obsessive beliefs in a domain such as depressive symptoms (e.g., hopelessness, helplessness, negative view of self and the world) would be more salient to women with depression when compared with those with OCD, eating disorders, or other forms of psychopathology. It could be speculated that individuals with other disorders may maintain strong beliefs in a depression-specific domain, particularly for disorders where depressive symptoms are regularly comorbid (e.g., anxiety disorders, eating disorders).
Comparison of Eating Disorder Diagnostic Categories on the OBQ-EDV

No significant differences emerged on a measure of eating, shape, and weight specific obsessive beliefs across the AN and BN groups. This is analogous to findings that incorporated the OBQ-44 (refer to Study 2), and extends on past literature that has examined general obsessive beliefs on the OBQ-87 across eating disorder diagnostic categories (Lavender et al., 2006). Although not significant, examination of descriptive statistics and effect size estimates indicated that the AN group had higher mean scores on the Importance/Control of Thoughts and Intolerance of Uncertainty subscales when compared with their BN counterparts, with small to medium effect sizes being found for these two comparisons. Minor variations in intolerance of uncertainty across AN and BN may be related to the rigid and restrictive dietary behaviours of AN. Distress and anxiety regarding the content of food and the risk of weight gain is often too extreme for women with AN to engage in regular eating (Waller et al., 2007), hence the distress associated with uncertainty is managed with dietary restraint. However, women with BN are able to tolerate the uncertainty associated with weight gain when engaging in an OBE, which may explain why scores on this obsessive belief domain are marginally lower for this diagnostic category. This coincides with research that has demonstrated an inverse relationship between impulsivity and intolerance of uncertainty, since the finding that impulsive behaviour is higher in women with BN when compared with women with AN (Matsunaga et al., 2000; Wiederman & Pryor, 1996) provides support for the findings of the current study regarding intolerance of uncertainty being greater in women with AN. Given the absence of a significant finding, this interpretation is partially speculative, and thus further research is necessary to examine whether a statistically significant difference exists between women with AN and women with BN on scores of intolerance of uncertainty.

Salient Obsessive Belief Domains in Eating Disorders
In the following discussion, possible modes of operation of each obsessive belief domain in the context of eating disorders are discussed, with references to past literature included where possible. Due to the dearth of literature in this area, discussion points and interpretations are at times speculative. It was hoped that balancing speculation with objectivity based on current findings would promote further research in this area.

**Perfectionism.** For women with an eating disorder, perfectionism in the domain of eating, shape, and weight had the second highest item average score of all OBQ-EDV subscales. This is consistent with the plethora of research demonstrating associations between eating pathology and perfectionism (Bastiani et al., 1995; Bulik et al., 2003; Davis et al., 2000; Franco-Paredes et al., 2005; McLaren et al., 2001; Shafran et al., 2002; Woodside et al., 2002), with elevated MPS-F scores having strong links with eating preoccupations, rituals, and resistance to change (Bastiani et al., 1995; Halmi et al., 2000).

When defining perfectionism in regards to obsessive beliefs, the OCCWG (1997) stipulate that high perfectionism is related to a “tendency to believe there is a perfect solution to every problem, that doing something perfectly is not only possible, but also necessary, and that even minor mistakes will have serious consequences” (p. 678). This definition is consistent with the content of items within the OBQ-EDV Perfectionism subscale (e.g., “In order to be a worthwhile person, every aspect of my body must be perfect”), and substantiates that items within this obsessive belief subscale represent a measure of perfectionism in a specific domain. The useability of this type of measure has been acknowledged by Shafran and associates (2002), who contend that eating disorders may represent a specific form of perfectionism that manifests in concerns about eating, shape, and weight.

In relation to the high perfectionistic tendencies reported by participants in the eating disorder group, consideration of the interaction between various obsessive
beliefs presents an ominous picture in regards to the cognitive challenges that confront this clinical population. For those women with eating disorders who express a broad range of obsessive beliefs, perfectionistic tendencies are likely to interact with overestimation of the threat of not losing weight, or of not maintaining a low weight. This is likely to be pressured by a sense of responsibility to achieve a series of short-term goals as well as an overarching longer term goal or target weight. When responsibility beliefs are coupled with a desire for perfection, distress and anxiety associated with uncertainty is likely to trigger a chronic and persistent need to continually monitor weight, with frequent engagement in dietary restrictive behaviours that will ensure success. The nature of perfectionism further compounds this process since attainment of a goal typically results in the goal posts being shifted to incorporate a new, revised objective that is necessary to receive gratification or promote self-worth. These characteristics, united by an overestimation of the importance of thoughts about the risks of not maintaining a minimally acceptable weight, amalgamate to a cognitive set that would be difficult for treating teams to disentangle, or more importantly, for the individual with the disorder to withstand.

**Intolerance of Uncertainty.** The Intolerance of Uncertainty subscale of the OBQ-EDV provides a psychometric measure of beliefs that researchers and practitioners have often reported anecdotally, through clinical observation, or in studies that have speculated about links between anxiety symptoms and eating disorders (Shafran et al., 2004; The Victorian Centre for Excellence in Eating Disorders, 2004; Waller et al., 2007). By examining participants’ ability to tolerate certainty around food intake, calorie content, and the perceived consequences of eating certain foods, a measurement of intolerance of uncertainty, as it applies to an eating disorder, was obtained. The current study provides a starting point for the examination of intolerance of uncertainty among the eating disorder population and indicates that women with eating disorders experience a general intolerance of uncertainty (as measured by the
OBQ-44) as well as more severe intolerance of uncertainty around eating, shape, and weight. Whilst high intolerance of uncertainty beliefs have been reported elsewhere (Dugas et al., 2004; Tolin et al., 2006), very few studies have incorporated an eating disorder sample in examining this construct, despite well-established links between intolerance of uncertainty and anxiety, and the links between anxiety and eating disorders (Godart et al., 2002; Godart et al., 2003; Keel et al., 2005; Tolin et al., 2006; Godart et al., 2006b).

Research on intolerance of uncertainty has also shown that when confronted with ambiguous stimuli, high intolerance of uncertainty is associated with the interpretation of the stimuli as threatening (Dugas et al., 2005). Dugas and colleagues (2005) contend that intolerance of uncertainty may present a predisposition to worry, particularly in the absence of exactness and perfection. In the context of eating disorders, uncertainty about the consequences of eating certain foods, or the risks of not participating in an exercise regime is often addressed by engaging in body checking behaviours or dietary restraint (Grilo et al., 2005; Hasse et al., 2007; Mountford et al., 2006; Williamson, White, York-Crowe, & Stewart, 2004). As such, there is great scope for research and clinical work on eating disorders to incorporate a measure of intolerance of uncertainty, since calorie counting, or restrictions in diet are at the forefront of presenting symptoms for these disorders and are likely to represent attitudes, beliefs, and behaviours that underlie difficulty tolerating uncertainty.

**Inflated Responsibility.** Although the parameters underlying inflated responsibility with respect to eating disorders have not been clearly delineated, studies have demonstrated that eating disorder patients, particularly those with AN, maintain values that are consistent with a sense of responsibility and accountability (Vitousek & Manke, 1994). Women with AN are often conscientious, have a strong adherence to societal rules, and avoid situations perceived as potentially harmful (Casper et al., 1992; Vitousek & Manke, 1994). Compared with OCD, one difference in responsibility
beliefs in eating disorders lies in the beliefs being centred on events and outcomes that can often be controlled. Body shape and weight is one area where a degree of control can be exerted, with behaviours such as dietary restriction, self-induced vomiting, or excessive exercise (all controllable by the individual) having a strong impact on weight. However, outcomes are not always controllable in the context of eating disorders, since target weights are often unattainable, yet an inflated sense of responsibility to reach this goal is maintained. In these circumstances, the degree of control that can be exerted is limited, although the belief may be upheld that the individual is responsible for achieving it anyway. Many events feared by individuals with OCD are also controllable (e.g., ensuring that household appliances are turned off to prevent a fire), whilst other events cannot actually be controlled yet a sense of responsibility is maintained (e.g., engaging in a counting ritual to ensure that a plane does not crash). In effect, having a sense of inflated responsibility for preventable or unpreventable events appears common to both disorders, although the level of control possible in the context of eating disorders may be higher than that of OCD.

Whether an individual has control over an event extends to perceptions about whether the event is likely to occur if action is not taken to prevent it. For example, an individual with OCD who believes certain rituals safeguard the wellbeing of her children is validated each time the ritual is completed and her children are not harmed. Over time, a relationship strengthens whereby safety is associated with an otherwise unconditioned stimulus, that being engagement in the ritual. Similarly, an individual with an eating disorder who engages in thought or behaviourally-based rituals in order to avert the risks associated with weight gain is likely to receive positive reinforcement from weight maintenance or reductions in weight. By not engaging in regular eating, the hypothesis that eating will not result in catastrophic weight gain cannot be evaluated. This relationship validates the implementation of hypothesis-testing strategies in eating
disorder treatment programs, particularly those that challenge beliefs surrounding the risks associated with eating (Waller et al., 2007).

**Overestimation of Threat.** Overestimation of threat was found to be prominent among women with eating disorders. Beliefs such as “I must restrict my diet to avoid putting on weight” and “Even when I am careful, I often think I might gain weight” were endorsed by women with both AN and BN to a larger extent than obsessive beliefs about Perfectionism, Intolerance of Uncertainty, and Importance and Control of Thoughts. This study is not the first to document overestimation of threat beliefs among this clinical population (Cooper & Turner, 2000; Meyer et al., 2000; Shafran, 2002). Eating disorder patients have been reported to exaggerate the risks of not exercising, the risks of eating even small amounts of food, or the social consequences associated with weight gain (Cooper & Hunt, 1998; Cooper & Turner, 2000; Shafran, 2002).

The DSM-IV-TR criteria for AN and BN emphasise the role of body weight or shape on self-evaluation (American Psychiatric Association, 2000). Given that self-concept is dependent on shape and weight, the risks associated with body shape changes, increases in weight, or difficulty attaining weight loss goals are likely to be distressing for these women. Grilo and colleagues (1994) have speculated about overestimation of threat predating the existence of an eating disorder, whilst also contributing to the maintenance of the condition and resistance to treatment. Findings of the current study provide evidence for the presence of overestimation of threat beliefs among women with eating disorders, although further research is necessary to identify whether these beliefs predate an eating disorder. The current study has indicated that whilst overestimation of threat is not the most salient obsessive belief domain, women with eating disorders largely overemphasise the risks associated with changes in body shape and weight, or the threat of changing an eating pattern or engaging in regular eating. In this regard, it is apparent that overestimation of threat
believes have several overlapping features with overestimation of threat beliefs documented in clinical populations with OCD.

**Importance of Thoughts.** With respect to women with eating disorders, overemphasising the importance of thoughts was a less salient obsessive belief domain than responsibility, overestimation of threat, and perfectionism. Despite this, women with eating disorders had significantly higher scores in this domain than the other clinical groups and the community control group. This finding indicates that thoughts about eating, shape, and weight are, in and of themselves, associated with emotional distress (e.g., regret, remorse, anxiety about consequences) for this clinical population. Participants in the eating disorder group endorsed items such as “For me, having bad urges to eat is as bad as actually eating” and “Having an unwanted thought or image about eating is as bad as actually eating”. Whilst this is the first study to measure overvaluation of the importance of thoughts with respect to beliefs about eating, shape, and weight, other dimensions of overemphasising thoughts have been measured, with similar findings being reported. Thought-Shape Fusion (TSF) is one such dimension, with the moral and likelihood aspects of TSF being analogous to the beliefs measured by the Importance of Thoughts domain of the OBQ-EDV. As stated in Chapter 3, moral TSF refers to the belief that thinking about eating is morally equivalent to eating. Similarly, likelihood TSF refers to the belief that thinking about food increases the risk the individual has gained weight or has endured a change in body shape (Shafran, 2002). Irrespective of the cognitive construct that has been under investigation, women with eating disorders have been consistently found to exaggerate the importance of thoughts or misinterpret the consequences of thoughts, particularly when negative cognitions about eating, shape, and weight are present.

Although causal relationships could not be demonstrated between overestimating the importance of thoughts and engaging in disordered eating behaviours in the current study, two studies have demonstrated links of this nature to
date (Radomsky et al., 2002; Shafran, 2002). In an experimental study, Shafran (2002) reported that asking 30 students to attend to thoughts about eating a forbidden food increased feelings of guilt, feelings about the risk of weight gain, and feelings about being overweight. Elevated anxiety symptoms and a desire to engage in body checking were reported as means of neutralising feelings of distress (Shafran, 2002). In a study by Radomsky and colleagues (2002), 75% of a sample of female inpatients with AN engaged in neutralising behaviours to reduce anxiety, fears of overweight, and fears associated with weight gain. Lower scores on TSF were related to less urge to neutralise, and fewer feelings of guilt about eating and weight gain (Radomsky et al., 2002). Based on these findings, it appears that women with eating disorders overemphasise thoughts in a similar way to individuals with OCD. However, women with eating disorders were found to overestimate the importance of thoughts with more intensity when thought content was related to an eating, shape, and weight domain.

Control of Thoughts. In the context of eating, shape, and weight concerns, results of the current research have indicated that thought control is a salient obsessive belief domain for women with eating disorders. This finding builds on past literature, which has highlighted that behavioural control (e.g., portion size, body checking, exercise) is a central feature of eating disorders (American Psychiatric Association, 2000; Harnden et al., 1997; Rothernberg, 1986). The current findings suggest that control extends to cognitive processes, whereby women with an eating disorder reported apprehension, distress, anxiety and a fear of losing control in relation to thought content about food, body shape, and weight. Specifically, participants endorsed items such as “Having intrusive thoughts about the look of my body and my weight means I’m out of control” and “I should be able to stop myself from having unwanted thoughts about food”. Given that these findings are preliminary, the biopsychosocial factors and predisposing, precipitating, and perpetuating influences that contribute to a desire to control thoughts remain unclear. Theorists contend that
obsessions and preoccupations stem from an attempt to control or suppress thoughts, since processes of thought suppression instigate a rebound effect, and heightened intensity of the thought (Wegner, 1989). Preliminary research has shown that among dieters, thought control strategies are utilised to manage anxiety surrounding eating, shape, and weight concerns (Harnden et al., 1997). Findings of the current study provide support for this, whereby women with eating disorders overestimated the importance of thoughts and expressed a desire to control thoughts associated with food-related stimuli (e.g., “If I let myself think about food, I worry I might lose control”). As such, the control of thoughts domain appears to interact with an overvaluation of the importance of thoughts and an overestimation of the threat associated with thoughts.

Mediational Analysis of Eating, Shape, and Weight Specific Obsessive Beliefs

Regression analyses were conducted to determine whether eating, shape, and weight specific obsessive beliefs mediate the relationship between general obsessive beliefs and eating disorder symptoms. A significant proportion of variability in the relationship between general obsessive beliefs and eating disorder symptoms was accounted for by domain specific obsessive beliefs on the OBQ-EDV. This finding was largely consistent across each subscale of the EDE-Q, with significant mediation found for the Restraint, Weight Concern, Shape Concern, and Eating Concern subscales, as well as the EDE-Q global score. In Step 1 of each regression analysis, general obsessive beliefs on the OBQ-44 were a significant predictor of eating disorder symptoms on the EDE-Q, with Beta coefficients ranging from .46 to .57 and accounting for between 21% and 33% of the variance in scores. Following the introduction of obsessive beliefs on the OBQ-EDV, Beta coefficients for the OBQ-44 fell to between -.06 and -.10, indicating that much of the variability in general obsessive beliefs was accounted for by obsessions about eating, shape, and weight. The greatest predictor of the EDE-Q global score was Responsibility/Threat Estimation, followed by Perfectionism. This is consistent with the earlier finding that women with an eating
disorder had the greatest average item score on the Responsibility/Threat Estimation subscale of the OBQ-EDV.

The Responsibility/Threat Estimation subscale was also the greatest predictor of Restraint, Weight Concern, and Shape Concern. As these three subscales constitute the global score on the EDE-Q, which is currently the most well-established self report measure of eating disorder symptomatology (Mond et al., 2006), this finding emphasises the potential for women with eating disorders to overestimate threat in critical eating disorder domains, namely shape, weight, and dietary restraint. It is plausible that overestimating the risks associated with regular eating triggers a divergence from normal eating patterns, which interacts with a sense of inflated responsibility to ensure the risk is averted.

Other predictors of Weight and Shape Concern included Importance/Control of Thoughts and Perfectionism, which each accounted for a similar amount of variability. All four OBQ-EDV subscales were found to account for a significant proportion of unique variance in predicting Eating Concern, with Importance/Control of Thoughts being the greatest predictor. Restraint and Eating Concern were the only EDE-Q subscales significantly predicted by Intolerance of Uncertainty. This finding further validates the conceptualisation of Perfectionism and Intolerance of Uncertainty as separate factors, since Perfectionism was found to be a significant predictor of all EDE-Q subscales aside from Restraint. The finding that Perfectionism was not a significant predictor of Restraint is surprising given that studies have advocated that perfectionistic traits are associated with dietary restrictive behaviours among eating disorder patients (Hewitt et al., 1995; Shafran et al., 2002).

Conclusion

In conclusion, the current study has revealed that when obsessive beliefs are measured in the domain of eating, shape, and weight, group-based differences emerge across clinical populations. Specifically, women with an eating disorder were found to
score higher on the OBQ-EDV total score than the OCD, depression, and community control groups. The current study has indicated that women with AN have mildly higher scores on the OBQ-EDV when compared with their BN counterparts, however a lack of statistical power due to small sample size precluded emergence of any statistically significant findings. It appears that perfectionism is the most salient obsessive belief domain in the context of eating disorders, followed closely by an intolerance of uncertainty. Furthermore, eating, shape, and weight specific obsessive beliefs mediate the relationship between general obsessive beliefs and eating disorder symptoms. A general discussion of the findings of the four studies presented in this research will be provided in the following chapter.
Chapter 11

General Discussion

Summary of Findings

Symptoms of OCD are a common occurrence in women with eating disorders (Godart et al., 2000; Shafran, 2002). Previous research has reported that between 20% and 28.6% of women with AN and between 0% and 42.9% of women with BN meet diagnostic criteria for OCD (Brewerton et al., 1995; Fornari et al., 1992; Godart et al., 2000; Halmi et al., 1991; Hudson et al., 1987; Kaye et al., 2004; Laessle et al., 1989; Lilenfield et al., 1998; Milos et al., 2002; Powers et al., 1988; Schwalberg et al., 1992; Skodol et al., 1993; Thornton & Russell, 1997), whilst between 6% and 12% of women with OCD are diagnosed with an eating disorder at some point in their lifetime (Fahy et al., 1993; Kasvikis et al., 1986; Rubenstein et al., 1992). In the current research, 46% of women with an eating disorder were found to score in the clinical range of OCD symptoms, whilst 23.8% of women with OCD fell in the clinical range of symptoms of disordered eating (global EDE-Q item average > 4.0). OCD symptoms were associated with engagement in a greater frequency of disordered eating behaviours, with SBEs, OBEs, and extreme dietary restraint being the most commonly reported disordered eating behaviours by women with an eating disorder or OCD. No significant differences were found when comparing OCD symptoms across eating disorder diagnostic categories, with women with AN reporting only mildly higher scores when compared with women with BN.

The current research was able to build on past literature by evaluating obsessive beliefs in an eating disorder population, and comparing the intensity of obsessive beliefs across clinical groups and a community control group. Obsessive beliefs were found to be a common occurrence in women with eating disorders, with the severity of these beliefs being equivalent to women with OCD or depression. This finding is consistent with past research that has revealed that clinical groups often have
scores of equal severity on the OBQ-44 (Tolin et al., 2006). For women with OCD, scores on the OBQ-44 were partially accounted for by general obsessive-compulsive symptoms on the OCI-R. However, this was not the case for women with eating disorders, which indicates that obsessive beliefs are largely independent of obsessive-compulsive symptoms for this clinical group. This finding was also evident for women with depression, which adds to speculation by other researchers (Tolin et al., 2006) that beliefs regarding an overestimation of threat, a sense of inflated responsibility, perfectionism, intolerance of uncertainty, and overestimation of the importance of thoughts are common to various clinical disorders, and may be at least partially independent of the symptoms of OCD. In effect, although a subsample of women with eating disorders who maintain high scores of obsessive beliefs are at risk of developing OCD, these beliefs can be retained in the absence an OCD clinical presentation.

Perfectionism and an intolerance of uncertainty were the most salient obsessive compulsive cognitions on the OBQ-44 reported by women with an eating disorder, followed by beliefs about inflated responsibility and overestimation of threat. Marginally higher obsessive belief scores were evident for women with AN when compared with women with BN. This is consistent with the characteristics of the AN, given the rigidly perfectionistic, ritualistic, and obsessive nature that is often exhibited by this eating disorder subset (Thiel et al., 1995; von Ranson et al., 1999). The strength of association between BN and obsessive beliefs, as well as the aforementioned relationship between BN and general obsessive-compulsive symptoms, provides further empirical evidence for the relationship between BN and OCD, despite the presence of symptoms such as loss of control and impulsive behaviours being contrary to OCD yet commonly evident in BN patients (Matsunaga et al., 2000; Wiederman & Pryor, 1996). In effect, more in depth analysis of the subtypes of BN may further tease out this relationship, given that Godart and colleagues (2003) reported that the
prevalence rates of OCD were 5.9% for women with BN-Purging, and 16.7% for BN-Non-Purging.

Development of the OBQ-EDV enabled measurement of obsessive beliefs (as measured by the OCCWG) in the domain of eating, shape, and weight for the first time known to the author. Factor analysis of the newly developed measure indicated that eating, shape, and weight specific obsessive beliefs cluster into the same domains as the original OBQ-44, with Responsibility/Threat Estimation and Importance/Control of Thoughts subscales emerging. Of note, Perfectionism and Intolerance of Uncertainty were found to load on independent factors. It may be theorised that this result stems from the relationship between these two cognitive dimensions, since intolerance of uncertainty is typically associated with worry (Dugas et al., 2004; Myers et al., 2008), whilst perfectionistic obsessions are related to a drive towards attainment of a goal, with coinciding fears and anxiety relating to the possibility of failure (Franco-Paredes et al., 2005).

Psychometric analysis of the OBQ-EDV was encouraging, with high internal consistency and strong content and criterion-related validity being evident across the OBQ-EDV subscales and total score. Whilst few significant differences emerged between the clinical groups on the OBQ-44, women with an eating disorder scored significantly higher than women with OCD on the Importance/Control of Thoughts and Perfectionism subscales of the OBQ-EDV, and higher than women with depression on the Intolerance of Uncertainty subscale. The finding that no significant differences were evident across the eating disorder, OCD, and depression groups for the Responsibility/Threat Estimation subscale suggests that women across all three clinical groups have a sense of inflated responsibility and a tendency to overestimate threat across domains. No significant differences emerged when comparing women with AN and women with BN on the OBQ-EDV, suggesting that domain specific obsessive beliefs are, at least for the current sample, equivalent across these diagnostic groups.
Theoretical Implications

The current research is the first to examine the prevalence and severity of obsessive beliefs among an eating disorder sample within Australia. Findings provide support for the notion that obsessive beliefs are present in clinical groups aside from those with OCD. Specifically, participants with other anxiety disorders, eating disorders, and depression have equivalent scores on several subscales of the OBQ-44 when compared with individuals with OCD (Tolin et al., 2006). With respect to women with eating disorders, it appears that obsessive beliefs are at least partially independent of obsessive-compulsive symptoms. Nonetheless, findings of the current research indicate moderate to strong correlations between obsessive-compulsive symptoms and obsessive beliefs, and thus further research is necessary to establish causal links between these variables as they pertain to eating disorders.

Findings support previous theoretical models proposing that eating disorders and OCD share several overlapping features with obsessive-compulsive symptoms, obsessive beliefs, and negative affect (Humphreys et al., 2007; Lavender et al., 2006; Tykra et al., 2002). Despite this, a range of distinguishable characteristics are also evident, with obsessive-compulsive symptoms accounting for considerably more variation in obsessive beliefs among women with OCD when compared with women with eating disorders. For women with an eating disorder, it is plausible that obsessive beliefs are precipitated by concerns over body shape and weight, rather than a series of obsessions and compulsive rituals. This notion has not always been articulated within the literature, with Rothernberg (1986) contending that eating disorders represent a “modern obsessive-compulsive syndrome” (p. 45), highlighting the obsessional focus on eating habits, body shape and weight, a definite desire for control, and fears that are both irrational and overestimate the likelihood of catastrophic consequences. It has also been suggested by von Ranson and colleagues (1999) that shape and weight preoccupations are phenomenologically similar to an obsession
whilst binge eating and purging behaviours represent compulsions. Research over the past two decades has suggested that the overlap between eating disorders and OCD is not likely to be as straightforward or unambiguous as this. Whilst it is evident that women with eating disorders present with a series of obsessions and obsessive beliefs, with rituals and compulsive behaviours also being common, the predisposing, precipitating, and perpetuating factors of these symptoms may differ across the two conditions. In the case of eating disorders, beliefs and behaviours of this nature are driven by body dissatisfaction, low self-esteem, a desire for perfection and control, and in many cases, negative affect. The interaction of these psychological elements with biological and social factors lends itself to a highly complex set of disorders which are difficult to treat. Theoretical models to date have had difficulty incorporating these constructs into a single model. It is hoped that the current research sheds light on the role of obsessive beliefs within an eating disorder framework, although it is acknowledged that further work is needed to examine the relationships between obsessive beliefs as they pertain to eating disorders and other biopsychosocial factors.

Recent cognitive-behavioural models advocate that dietary control and restraint, fears of weight gain, ideas about remaining thin, and weight loss goals stem from an underlying core psychopathology, that being concerns over shape and weight (Fairburn, Shafran, & Cooper, 1998). One feature that has been difficult to explain within this model is binge eating. Hay, Darby, and Quirk (2009) contend that under a cognitive-behavioural umbrella, binge eating represents an extreme reaction to dietary rules being broken, with even minor slip-ups being appraised as a loss of control. The resultant abandonment (albeit temporary) of dietary rules often includes a binge eating episode. Whilst it is acknowledged that this pattern of restriction and loss of control interacts with daily stressors, stressful life events, and affective disturbances, this model provides a formulation of eating disorder symptoms that is clearly distinguishable from a symptom pattern that would be typical of an individual with OCD.
Despite this, findings of the current study indicate that several cognitive styles that are associated with OCD are also present in women with eating disorders. Further research is necessary to identify whether such overlap predisposes women to develop a form of eating pathology or perpetuates the condition over time.

**Implications for Clinical Practice**

**Assessment and Diagnosis.** Findings of the current research provide further evidence for the inclusion of an OCD assessment or an evaluation of obsessive beliefs as part of an overall clinical assessment for eating disorders. Clinicians need to be mindful of the domains of obsessive beliefs, based on their presence and incidence in disorders such as OCD, eating disorders, other anxiety disorders, and depression. As has been highlighted throughout this research, a dearth of literature exists on the cognitive domains of OCD in the context of eating disorders. Considerable research is available in regards to perfectionism, and importance of thoughts has gained some attention through studies on TSF. However, very few researchers have examined inflated responsibility, overestimation of threat, intolerance of uncertainty, and control of thoughts. As a consequence, inclusion of these cognitive dimensions is not currently a priority in assessing the nature and severity of eating disorders, and thus these domains are seldom included in a clinical evaluation. In the absence of this type of assessment, important causal or maintaining factors may be missed by the assessing clinician, which is likely to result in an incomplete formulation.

This research has also introduced an exciting new measure that will be available to clinicians when an assessment of obsessive-compulsive cognitions is necessary in the context of an eating disorder assessment. The OBQ-EDV provides clinicians with a short yet comprehensive measure of obsessive-compulsive cognitions in the domain that is most salient to eating disorders. Administering this measure during the assessment phase or at the outset of treatment will provide treating teams with an understanding of the obsessive beliefs that are most severe for the individual,
as it can be expected that different obsessive belief profiles will emerge across patients. Information gathered from this self-report assessment will provide the treating team with information that may guide intervention choices, particularly when a comorbid OCD diagnosis is present in the context of an eating disorder. This measure can also be utilised in association with the EDE-Q, OCI-R, and the OBQ-44. An assessment battery comprising these measures is likely to provide clinicians with detailed information regarding overlapping symptomatology between eating disorders and OCD.

**Clinical Training and Intervention.** In cases where it has not been provided already, an argument could be mounted for clinicians who work in the eating disorder field to be provided with specific training in the diagnosis and treatment of OCD, given that cognitive and behavioural strategies employed in this area may have utility in the treatment of eating disorders. Current treatment models for eating disorders emphasise cognitive assessment of body concept, body dissatisfaction, body perception, and fear of weight gain, with these being perpetuated by views about threat and a sense of responsibility to ensure that a feared consequence does not occur. Cognitive elements are addressed in the context of psychoeducation about the overvaluation over eating, shape, and weight, and the automatic thoughts, assumptions, and core beliefs that coincide with these concerns. Psychoeducation is also provided in relation to food and eating (e.g., basic nutrients, protein, carbohydrates, fats), food groups (e.g., bread, cereals, meat, fish, milk and dairy), the pros and cons of calorie counting, myths about eating, and set point theory. Whilst this model has been shown to be efficacious (Waller et al., 2007), it is well-accepted that resistance to treatment and relapse following a period of successful treatment is common among eating disorder patients. In communicating cognitive tendencies to the client, acknowledging these barriers to treatment may be helpful. This may involve engaging the client in discussion about perfectionistic tendencies, the difficulty encountered when confronted with uncertainty,
or the sense of inflated responsibility to prevent feared consequences. Discussing these constructs is likely to validate the fears and anxieties experienced by the client whilst preparing the client for potential difficulties that may be endured over the course of treatment.

Addressing obsessive-compulsive symptomatology directly may also facilitate successful treatment for the eating disorder. Individuals with eating disorders regularly present with compulsive tendencies, with obsessions around food, eating, body shape, and weight being present in the majority of cases. Utilisation of evidence-based treatment strategies for OCD may be appropriate in some cases, even if a select number of strategies are implemented as part of a more traditional treatment plan for eating disorders. For example, using exposure trials or response prevention strategies may be appropriate, particularly when clinical judgement suggests that exposing the patient to feared stimuli is likely to act as an opportunity for the patient to test a belief, seek evidence for and against the belief, and potentially disprove the belief and its associated consequences.

In summary, findings of the current research present a series of theoretical and clinical implications for the study and treatment of eating disorders. Although several strategies that have been highlighted may already be practiced by mental health clinicians, the current findings provide evidence for the implementation of more widespread assessment of OCD and utilisation of strategies that have proven effective in the treatment of this condition.

Methodological Issues and Limitations

Recruitment Issues and Generalisability of Findings

Recruitment of a representative sample is a methodological constraint confronting all research, with the current study being no exception. Although a sample exceeding 1200 women was recruited, several limitations are evident and should be considered. Firstly, it was not possible to recruit a sample of anxious controls (e.g.,
women presenting with GAD, PTSD, or social phobia). Whilst a small number of participants reported a diagnostic history of these conditions, inclusion in a comparison group was not possible due to the small sample size and the consequential limitations on the power of the analysis. This issue was also evident for the eating disorder diagnostic categories, with adequate subsamples available to only group participants into AN, BN, EDNOS, and unspecified eating disorder groups. Sufficient samples were not available to divide the AN and BN groups into subtypes, nor was it possible to include the EDNOS and unspecified eating disorder groups in any significance testing. Findings of the current research can also not be generalised to males since they were not incorporated into the current sample. This was due to the exploratory nature of the current research and past research highlighting that skewed scores are often provided on measures of eating disorders by males recruited in community-based samples (American Psychiatric Association, 2000; Barlow & Durand, 2005; Wilson, 2005).

Utilisation of an online measure for recruitment of the community sample also constitutes a limitation to the current research. Research has been equivocal in regards to whether online questionnaires result in amplified scores on clinical measures, with authors advocating that interview based data is most reliable when working with clinically-based variables (Mond et al., 2004b). A counterargument is that administering the questionnaire online enabled participation of women from all Australian states, thus promoting the representativeness of the sample at a national level. It is possible that advertising the research via eating and anxiety disorder associations resulted in a skewed distribution of scores towards women with a clinical presentation, however analysis of data for the current sample is similar to that obtained in previous research that has utilised interview-based data collection procedures or hardcopy questionnaires (Shafran et al., 2004).

Due to a series of self-report questionnaires being utilised, and the sample being recruited in a voluntary and anonymous capacity, it was not possible to conduct
any qualitative assessments with participants. It is likely that interviews would have
provided some fruitful information, both diagnostically and in regards to symptoms of
OCD and obsessive beliefs. This is particularly the case for the measurement of more
complex symptoms of eating disorders such as subjective and objective binge eating
episodes, which can be unreliable when based on self-report measures alone. One
limitation of the use of self-report measures is that diagnostic history could not be
verified using a semi-structured clinical interview, particularly in diagnosing participants
with an eating disorder. Several interview schedules are available for this purpose
(e.g., Structured Clinical Interview for DSM-IV, EDE), however the nature of the study
precluded the use of these assessments. Reliance on self-report assessments of
height and weight to measure BMI is also less than ideal given the tendency for self-
report measures of height and weight to be at times inaccurate. Based on this
methodological limitation, categorisation of clinical-group status was based on self-
reported diagnostic history with convergent evidence for current symptomatology being
provided by clinically-based self-report measures. Whilst only diagnostic measures that
are considered the gold standard were utilised (e.g., EDE-Q, OCI-R), limitations to this
research design should be considered when interpreting findings of the current
research.

Another limitation of the current study relates to the inability to compare
participants recruited from the community with those recruited from clinical centres.
Given that participants in both the clinical and community sample had the option of
completing a hardcopy or online version of the questionnaire, it was not possible to
identify the total number of participants who were recruited from community-based
outpatient centres (e.g., The Bronte Centre at St Vincent’s) as opposed to those who
were recruited from the general community. Whilst it would have been ideal if
comparative data on age and severity of illness could be obtained for the clinical and
community-based samples, this was not possible given that ethics approval was based on all participants completing the questionnaire package anonymously and voluntarily.

Given the significant differences in age and BMI across the diagnostic groups, consideration should be given to the mediational or moderating effect of age or BMI in the differences in eating disorder, OCD, and depressive symptomatology across the four groups. Whilst additional analyses were completed to control for the effect of differences that were due to age or BMI (e.g., entering these variables as co-variates), further research is necessary to replicate findings of the current studies that incorporate groups that are matched on these characteristics.

**Quantitative Measures**

A combination of well-established and newly developed measures were used in the current research. Preliminary investigation of the psychometric properties of measures that were designed for the purposes of the current research (e.g., OBQ-EDV) has yielded some positive results. Nonetheless, further assessment of the psychometric properties of these measures, particularly the OBQ-EDV, is necessary with other clinical groups as well as male participants. A more thorough assessment of the construct validity of this measure would be ideal, whilst use with other clinical populations will add to the criterion-related validity of this measure.

A final limitation of the measures utilised in this research pertains to measures that, whilst relevant to the research, were not incorporated due to limitations on the length and scope of the investigation. For example, it would have been useful to incorporate a measure of TSF, given the relationship between TSF and the obsessive belief importance of thoughts. It would also have been valuable if a measure of body avoidance was utilised, given the relationship between body checking and body avoidance, and the possibility of examining relationships between body avoidance and obsessive-compulsive symptomatology.
Recommendations for Future Research

There is scope to expand on the findings of the current research in several areas. Only a small handful of studies to date have examined obsessive beliefs in the context of disordered eating symptoms, with even fewer incorporating a clinical sample. Research is yet to examine differences in obsessive beliefs across the subtypes of AN and BN, and obsessive beliefs have not been examined in comparison groups incorporating Binge Eating Disorder. More importantly, clinical groups comprising OCD, eating disorders, and comorbid OCD and disordered eating have not been compared in relation to obsessive beliefs, with investigations into the similarities and differences across the core obsessive belief domains being necessary.

Other pertinent variables also warrant inclusion in future work on eating disorders and obsessive beliefs. As previously alluded to, it would be useful to examine the relationship between TSF and the obsessive belief domain importance of thoughts, since both constructs appear to tap into similar underlying cognitive content. A relationship between intolerance of uncertainty and worry has been documented in previous literature (Dugas et al., 2004; Myers et al., 2008), however this relationship has not been comprehensively evaluated with a clinical sample of women with eating disorders. A thorough assessment of the relationship between these cognitive styles may clarify distinguishable characteristics between perfectionism and intolerance of uncertainty, based on the finding that these two obsessive belief domains load on a single factor on the OBQ-44 and separate factors on the OBQ-EDV. Other constructs worthy of examination include the relationship between shape and weight specific obsessive beliefs and the incidence of thought suppression and neutralising behaviours. Whilst thought suppression has gained some attention within the eating disorders literature (Harnden et al., 1997), few studies have incorporated a clinical sample. Furthermore, the OBQ-EDV enables researchers to examine the strength of
association between thought suppression and obsessions that are specific to eating, shape, and weight domains.

Based on the strong relationship between intrusive thoughts and obsessive beliefs among individuals with OCD, it would be fruitful to identify whether a similar relationship exists between intrusive thoughts and the eating, shape, and weight specific obsessive beliefs that are encountered by women with eating disorders. It could be hypothesised that the frequency and severity of intrusive thoughts is low in this clinical population, given the presence of ego-syntonic beliefs and the finding in the current research that obsessive-compulsive symptoms do not account for the elevated obsessive belief scores reported by women with eating disorders.

Despite the strong psychometric properties of the OBQ-EDV, further validation of this newly developed measure is needed. Utilising this measure with other clinical populations would be a positive step, particularly those that incorporate subtypes of AN and BN, and larger samples of women with EDNOS. Further examination of the factor structure of this measure is also necessary, in order to replicate the factor structure reported in the current research, and identify whether Perfectionism and Intolerance of Uncertainty cluster into independent factors with other samples.

Replication of the current findings is also likely to promote inclusion of empirical work on obsessive beliefs into clinical treatment models. Treatment manuals for eating disorders have been improving steadily, particularly over the past 10 to 15 years, with evidence accumulating for the efficacy of the Maudsley model of family therapy, CBT for eating disorders, and interpersonal psychotherapeutic approaches to treating disordered eating (Hay et al., 2009; Paxton, Shelton, & McLean, 2009; Rhodes & Wallis, 2009; Rieger, 2009). Community and internet-based interventions have also gained some recent attention (Hay et al., 2007; Paxton, McLean, Gollings, Faulkner, & Wertheim, 2007). It is hoped that findings of the current research shed further light on the cognitive dimensions associated with eating disorders, however further research is
necessary to provide a more concrete rationale for the acknowledgment of obsessive-compulsive cognitions in treatment manuals.

Conclusions

The current research aimed to examine the overlapping and distinguishable cognitive dimensions of eating disorders and OCD. The results of the four studies provide valuable information regarding the relationship between eating disorder and OCD symptomatology, and the nature and severity of obsessive beliefs among an eating disorder sample. It was determined that eating disorder symptoms are associated with various obsessive-compulsive symptom domains, including washing, checking, ordering, obsession, hoarding, and mental neutralisation, with women with an eating disorder reporting scores on a measure of OCD that were statistically equivalent to their counterparts with OCD. Frequent engagement in disordered eating behaviours such as objective and subjective binge eating, purging, and extreme dietary restraint were found to be associated with elevated symptoms of OCD. Scores on a measure of general obsessive beliefs, the OBQ-44, were similar across OCD, eating disorder, and depression groups, although a greater proportion of variability in scores was accounted for by obsessive-compulsive symptoms for the OCD group, when compared with the eating disorder and depression groups.

It is hoped that development of an eating, shape, and weight specific measure of obsessive beliefs, the OBQ-EDV, will provide a valuable contribution to the eating disorder and OCD literature. This measure has a similar factor structure to the OBQ-44, and has the potential to be utilised in both research and clinical settings. The psychometric properties of this measure are encouraging, however additional research with larger clinical samples is necessary to further validate this measure. Preliminary investigation suggests that women with an eating disorder maintain more severe obsessive beliefs in the domain of eating, shape, and weight when compared with women with OCD and depression. It is noteworthy however that all clinical groups
scored higher than community controls on the OBQ-EDV. Few significant differences were found across the eating disorder diagnostic categories on either the OBQ-44 or the OBQ-EDV, however future research that examines subtypes of eating disorders may yield different results.

This research provides a positive step regarding the incidence and severity of obsessive beliefs among women with eating disorders. Whilst initial investigation of domain specific obsessive beliefs has yielded some promising findings, further research is necessary. It is hoped that future research will build on findings of the current research and utilise obsessive belief dimensions in treatment models and broader clinical practice. Greater acknowledgment of the overlapping features of eating disorders and OCD, whilst remaining cognisant of the distinguishable factors, is likely to be constructive for mental health clinicians working with individuals with eating disorders, with the long-term goal being to improve treatment outcomes for this clinical population.
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Appendix A

DSM-IV-TR Diagnostic Criteria for Anorexia Nervosa

A. Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).

B. Intense fear of gaining weight or becoming fat, even though underweight.

C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.

D. In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles. (A woman is considered to have amenorrhea if her periods occur only following hormone, e.g., estrogen, administration.)

Specify type:

Restricting Type: During the current episode of Anorexia Nervosa, the person has not regularly engaged in binge-eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

Binge-Eating/Purging Type: During the current episode of Anorexia Nervosa, the person has regularly engaged in binge-eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas).
Appendix B
DSM-IV-TR Diagnostic Criteria for Bulimia Nervosa

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:

(1) 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 during a similar period of time and under similar circumstances.

(2) A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).

B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.

C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months.

D. Self-evaluation is unduly influenced by body shape and weight.

E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Specify type:

Purging Type: During the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Nonpurging Type: During the current episode of Bulimia Nervosa, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.
Appendix C

DSM-IV-TR Diagnostic Criteria for Eating Disorder Not Otherwise Specified

The Eating Disorder Not Otherwise Specified category is for disorders of eating that do not meet the criteria for any specific Eating Disorder. Examples include:

1. For females, all of the criteria for Anorexia Nervosa are met except that the individual has regular menses.

2. All of the criteria for Anorexia Nervosa are met except that, despite significant weight loss, the individual’s current weight is in the normal range.

3. All of the criteria for Bulimia Nervosa are met except that the binge eating and inappropriate compensatory mechanisms occur at a frequency of less than twice a week or for a duration of less than 3 months.

4. The regular use of inappropriate compensatory behavior by an individual of normal body weight after eating small amounts of food (e.g., self-induced vomiting after the consumption of two cookies).

5. Repeatedly chewing and spitting out, but not swallowing, large amounts of food.
Appendix D

DSM-IV-TR Diagnostic Criteria for Obsessive-Compulsive Disorder

A. Either obsessions or compulsions:

Obsessions as defined by (1), (2), (3), and (4):

(1) recurrent and persistent thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety or distress
(2) the thoughts, impulses, or images are not simply excessive worries about real-life problems
(3) the person attempts to ignore or suppress such thoughts, impulses, or images, or to neutralize them with some other thought or action
(4) the person recognizes that the obsessional thoughts, impulses, or images are a product of his or her own mind (not imposed from without as in thought insertion)

Compulsions as defined by (1) and (2):

(1) repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession, or according to rules that must be applied rigidly
(2) the behaviors or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviors or mental acts either are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive

B. At some point during the course of the disorder, the person has recognized that the obsessions or compulsions are excessive or unreasonable. Note: This does not apply to children.
C. The obsessions or compulsions cause marked distress, are time consuming (take more than 1 hour a day), or significantly interfere with the person's normal routine, occupational (or academic) functioning, or usual social activities or relationships.

D. If another Axis I disorder is present, the content of the obsessions or compulsions is not restricted to it (e.g., preoccupation with food in the presence of an Eating Disorder; hair pulling in the presence of Trichotillomania; concern with appearance in the presence of Body Dysmorphic Disorder; preoccupation with drugs in the presence of a Substance Use Disorder; preoccupation with having a serious illness in the presence of Hypochondriasis; preoccupation with sexual urges or fantasies in the presence of a Paraphilia; or guilty ruminations in the presence of Major Depressive Disorder).

E. The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition.

Specify if:

With Poor Insight: if, for most of the time during the current episode, the person does not recognize that the obsessions and compulsions are excessive or unreasonable.
Appendix E

Obsessive Beliefs Questionnaire – Disordered Eating Version

For each of the statements, choose the number matching the answer that best describes how you think most of the time.

1 – Disagree very much
2 – Disagree moderately
3 – Disagree a little
4 – Neither agree nor disagree
5 – Agree a little
6 – Agree moderately
7 – Agree very much

1. I often think eating small amounts of food will cause me to gain weight. 1 2 3 4 5 6 7
2. For me, having bad urges to eat is as bad as actually eating. 1 2 3 4 5 6 7
3. I must restrict my diet to avoid putting on weight. 1 2 3 4 5 6 7
4. My weight will shoot up if I am not careful. 1 2 3 4 5 6 7
5. I must keep working at my weight until it is just right. 1 2 3 4 5 6 7
6. The more I think about weight gain, the greater the risk that I will gain weight. 1 2 3 4 5 6 7
7. If I’m not absolutely sure of what I eat, I’m bound to put on weight. 1 2 3 4 5 6 7
8. Avoiding changes in my body shape and weight requires constant effort on my part. 1 2 3 4 5 6 7
9. It is essential for me to consider all possible outcomes of what I eat. 1 2 3 4 5 6 7
10. My body shape should be perfect according to my own standards. 1 2 3 4 5 6 7
11. I should be able to stop myself from having unwanted thoughts about food. 1 2 3 4 5 6 7
12. Even when I am careful, I often think I might gain weight. 1 2 3 4 5 6 7
13. Having a thought about eating large amounts of food is as bad as actually eating the food. 1 2 3 4 5 6 7
14. Failing to prevent gaining weight is just as bad as deliberately gaining weight. 1 2 3 4 5 6 7
15. In order to be a worthwhile person, every aspect of my body must be perfect. 1 2 3 4 5 6 7
16. Not having nutritional information about food I am about to eat upsets me greatly. 1 2 3 4 5 6 7
17. When I see an opportunity to do so, I must act to prevent weight gain. 1 2 3 4 5 6 7
<p>| | | | | | | |</p>
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<tr>
<td>18. Even if gaining weight is very unlikely, I should try to prevent it at any cost.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>19. To me, failing to prevent putting on weight is as bad as causing weight gain.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>20. Even eating small amounts of food increases the risk of weight gain.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>21. If I don’t restrict my diet or exercise, then I am to blame for any consequences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>22. Having an unwanted thought or image about eating is as bad as actually eating.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>23. I must be certain of what is contained in the food that I consume (e.g., calories, fat content etc).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>24. No matter how I look, it won’t be good enough.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>25. If I let myself think about food, I worry I might lose control.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>26. If I don’t look perfect, people won’t respect me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>27. For me, gaining a little bit of weight is as bad as gaining a lot of weight.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>28. Not preventing weight gain is as bad as gaining weight.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>29. Having intrusive thoughts about the look of my body and my weight means I’m out of control.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>30. I must not eat a certain food if I am unsure of the effect it will have on my weight.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>31. I am not happy with my body unless it is perfect.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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</tbody>
</table>
Dear Adrian

SETAPP 78 – 07 SHEMBRI The Overlapping and Distinguishable Cognitive Constructs Associated with Eating Disorders and Obsessive-Compulsive Disorder

Thank you for submitting your amended application for review.

I am pleased to inform you that the committee has approved your application for a period of **3 Years** to **February 2011** and your research may now proceed.

The committee would like to remind you that:

All data should be stored on University Network systems. These systems provide high levels of manageable security and data integrity, can provide secure remote access, are backed up on a regular basis and can provide Disaster Recover processes should a large scale incident occur.

The use of portable devices such as CDs and memory sticks is valid for archiving, data transport where necessary and for some works in progress;

The authoritative copy of all current data should reside on appropriate network systems; and the Principal Investigator is responsible for the retention and storage of the original data pertaining to the project for a minimum period of five years.

Annual reports are due during December for all research projects that have been approved by the Human Research Ethics Sub-Committee.

The necessary form can be found at:
http://www.rmit.edu.au/rd/hrec

Yours faithfully,

**Associate Professor Dr Barbara Polus**
Chair, Science Engineering & Technology Portfolio
Human Research Ethics Sub-Committee ‘B’

Cc   HRE-SC Member: Diane Niblo School of Health Sciences
     HRE-SC Member: Diana Donohue School of Medical Science
     Supervisor: David Smith School of Health Sciences
MEMORANDUM

TO:  Professor S Paxton, School of Psychological Science/Mr A Schembri, School of Health Sciences, RMIT

FROM:  Ms K Collins, Secretary (Research Ethics), Faculty of Science, Technology and Engineering

SUBJECT:  Ethics application: Cognitive constructs associated with eating disorders and obsessive-compulsive disorder

DATE:  2 April 2008

Your application has been granted provisional approval but the following should be noted:

1. The re-written 2 sentence, 50 word Lay Summary still exceeds the word limit, but is accepted by FHEC.

2. Final approval requires evidence of approvals from RMIT University Ethics Committee (for non-clinical participants), and from the ethics committees responsible for the "local hospitals and clinics" (for clinical participants). FHEC can grant Provisional Approval for the non-clinical sampling, subject to RMIT approval, and Provisional Approval for clinical sampling subject to RMIT and the other approvals.

3. Participant Information Sheets should be amended to include, under the heading "Who is involved..." the fact that the FSTE FHEC at La Trobe University has also approved the project, since it is inconsistent to state that RMIT ethics committee has approved, but direct complaints to the LTU ethics committee. A copy of amended forms to be lodged with FHEC for records.

Kaye Collins
Appendix G

Plain Language Statement – Online Questionnaire
**INVITATION TO PARTICIPATE IN A RESEARCH PROJECT**

**PROJECT INFORMATION STATEMENT**

**Project Title:**
What’s Really Eating You? Providing some Food for Thought

**Investigators:**
Primary investigator: Adrian Schembri  
Division of Psychology, RMIT University  
adrian.schembri@student.rmit.edu.au

Project Supervisor: Associate Professor David Smith  
Division of Psychology, RMIT University  
david.smith@rmit.edu.au, 9925 7523

Secondary Project Supervisor:  
Professor Susan Paxton  
School of Psychological Science  
La Trobe University  
susan.paxton@latrobe.edu.au, 9479 1736

Dear Participant,

You are invited to participate in a research project being jointly conducted by RMIT University and La Trobe University. This information sheet describes the project in straightforward language, or ‘plain English’. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators.

**Who is involved in this research project? Why is it being conducted?**
The current research is being conducted by Adrian Schembri as partial fulfilment of the Doctor of Psychology degree at RMIT University, under the supervision of Associate Professor David Smith, Professor Susan Paxton, and Ms Trish Altieri. This research has been approved by the RMIT University Human Research Ethics Committee and the Faculty of Science, Technology and Engineering Faculty Human Ethics Committee at La Trobe University. This study is being conducted collaboratively with the Division of Psychology at RMIT University and the School of Psychological Science at La Trobe University.

**Why have you been approached?**
We are interested in investigating the eating behaviours and psychological health of females aged 18 years and above. Individuals who meet these criteria have been approached and invited to participate.

**What is the project about? What are the questions being addressed?**
The present study aims to examine relationships that are associated with stress, eating, and anxiety, and identify various aspects of an individual’s lifestyle that are associated with eating behaviours, dietary restraint, and exercise. In particular, the thoughts, feelings, and behaviours that are associated with perceptions of body shape
and weight will be investigated as well as the personality characteristics that relate to different coping styles.

**If I agree to participate, what will I be required to do?**

As a participant in this study, you will be asked to fill in an online questionnaire that will require approximately 20 minutes to complete. The questionnaire contains several demographic questions regarding your age, living arrangements, and level of education. The questions also address eating and exercise behaviours, and thoughts about shape and weight. Finally, the survey enquires about your individual way of coping with stress and worry and some of the thoughts you may have in relation to this.

You are encouraged to examine or browse through the questionnaire as it may aide in your decision to participate in the study. If you agree to participate, you may complete the questionnaire by clicking on the link below.

**What are the risks associated with participation?**

Whilst there are no direct risks or disadvantages involved in your participation in the present study, if you feel concerned about your responses to any of the questionnaire items or if you find participating in the project distressing in any way, you should contact Dr David Smith as soon as convenient on 9925 7523. Dr Smith will discuss your concerns with you confidentially and suggest appropriate follow-up, if necessary. Alternatively, you can contact the RMIT University Psychology Clinic on 9925 7603 or 9925 7376.

**What are the benefits associated with participation?**

Whilst there are no direct benefits for participating in this study, your input will provide vital information regarding the relationships between our thoughts and feelings, and how these are associated with behaviour, particularly eating and dietary behaviours.

**What will happen to the information I provide?**

*Security of the website*

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user’s transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects.

*Security of the data*

This project will use an external site to create, collect and analyse data collected in a survey format. The site we are using is SurveyMonkey. If you agree to participate in this survey, the responses you provide to the survey will be stored on a host server that is used by SurveyMonkey. No personal information will be collected in the survey so none will be stored as data. Once we have completed our data collection and analysis, we will import the data we collect to the RMIT University server where it will be stored securely for a period of five (5) years. The data on the SurveyMonkey host server will then be deleted and expunged.

All information will remain strictly confidential. Only the project investigators will have access to the data. Any information that you provide can be disclosed only if (1) it is to protect you or others from harm, (2) there is a legal requirement to do so, or (3) you provide the researchers with written permission. The results obtained from within the questionnaire booklets will be used in the compilation of a research report.
and may appear in a journal publication in the future. However, only group data will be included and under no circumstances will individual scores be reported.

**What are my rights as a participant?**
As a participant in this research, you have the right to have any questions answered at any time. You also have the right to withdraw from the study prior to completion of the questionnaire, without prejudice. You are welcome to read through this information sheet and have a browse through the questionnaire prior to deciding whether you would like to participate. Since this research is completely anonymous, there will not be any identifying information located on your submitted questionnaire. As such, it will not be possible to withdraw your data from the study once your questionnaire has been submitted.

**Who should I contact if I have any questions?**
If you have any questions regarding this study, please feel free to contact Adrian Schembri via email at adrian.schembri@student.rmit.edu.au. Alternatively, you are welcome to contact Dr David Smith on 9925 7523 or via email at david.smith@rmit.edu.au.

If you have any complaints or queries that the researcher has not been able to answer to your satisfaction, you may contact the Ethics Liaison Officer, Faculty Human Ethics Committee, Faculty of Science, Technology and Engineering, La Trobe University, Victoria, 3086, (Ph: 9479 3698, e-mail: k.collins@latrobe.edu.au).

Yours sincerely,

Adrian Schembri
B.App.Sci (Psych)(Hons)

David Smith
B.B.Sc (Hons), MPsych., PhD

Susan Paxton
BA (Hons), MPsych., PhD

Trish Altieri
BA (Hons), MPsych.
October 10, 2008

Dear Adrian Schembri and David Smith,

Thank you for your interest in SurveyMonkey.com.

As stated in our privacy policy, we will not use your data for our own purposes. The data you collect is kept private and confidential. You are the owner of all data collected or uploaded into the survey.

In regards to the security of our infrastructure, here is an overview of our setup.

🌟 We do offer SSL encryption for the survey link and survey pages during transmission. The cost is an additional $9.95 per month.

We are located in the US and all surveys and data are stored on our servers. The servers are kept at Sungard - www.sungard.com.

**Physical**

- Servers kept in locked cage
- Entry requires a passcard and biometric recognition
- Digital surveillance equipment
- Controls for temperature, humidity and smoke/fire detection
- Staffed 24/7

**Network**

- Multiple independent connections to Tier 1 Internet access providers
- Fully redundant OC-48 SONET Rings
- Uptime monitored every 5 minutes, with escalation to SurveyMonkey staff
- Firewall restricts access to all ports except 80 (http) and 443 (https)
• QualysGuard network security audits performed weekly. Hackersafe scans performed daily.

Hardware

• Servers have redundant internal power supplies
• Data is on RAID 10, operating system on RAID 1
• Database is log-shipped to standby server and can failover in less than one hour

Software

• Code in ASP.NET 2.0, running on SQL Server 2005 and Windows 2003 Server
• Latest patches applied to all operating system and application files
• SSL encryption of all billing data and passwords
• Data backed up every hour internally
• Data backed up every night to centralized backup system, with offsite backups in event of catastrophe

Please let me know if you have any additional questions.

Thanks,

Chris Finley
SurveyMonkey.com
Appendix I
Sources of Recruitment

Each of the following services promoted awareness of this research through by including a brief advertisement on a website, newsletter, or email to members. Several organisations provided hardcopy information to members and also invited that a drop box to be placed on location within the centre where questionnaires could be returned.

- Anorexia and Bulimia Support Resource Centre – Queensland
- Anxiety Disorders Association of Victoria (ADAVIC)
- Anxiety Resource Centre (ARCVic) – Victoria
- Bridges Association Incorporated – Western Australia
- Centre or Clinical Interventions (CCI) – Western Australia
- Centre for Eating and Dieting Disorders (CEDD) – New South Wales
- Eating Disorder Association (EDA) – South Australia
- Eating Disorder Association (EDA) – Queensland
- Eating Disorders Foundation Incorporated – New South Wales
- Eating Disorders Foundation of Victoria (EDFV)
- ISIS – Queensland
- Reconnexion – Victoria
- Recovery Is Possible for Everyone (RIPE)
- The Bronte Foundation at St. Vincent’s – Victoria
- The Butterfly Foundation – Victoria
- The Oak House – Victoria
- Women’s Healthworks – Western Australia
Appendix J

Recruitment Flyer
Appendix K

Recruitment Bookmark
PARTICIPANTS NEEDED

What’s Really Eating You?

If you are a woman aged 18 years or older, we would like to hear from you as we are examining stress and anxiety, as well as aspects of your lifestyle that are associated with eating behaviours, dietary restraint, and exercise.

To access the questionnaire, go to the website, or have a hardcopy sent out to you by emailing Adlien Schenberat adlien.schenberat@student.rmit.edu.au:

http://www.rmit.edu.au/psychology/whatsreallyeatingyou/
Appendix L

Copy of the September, 2008 Media Release
Eating disorder study examines women’s food fears

A national study by RMIT University researchers is examining female fears about food, fat and weight to find out how many Australian women could be at risk of developing eating disorders.

The research, conducted by RMIT and La Trobe University, will look at whether a woman’s dissatisfaction with her body, shape and size contributes to risky behaviours and thought patterns associated with disorders such as anorexia, bulimia and binge eating.

Principal investigator Adrian Schembri said researchers needed volunteers from across Australia to take part in the What’s Really Eating You project by filling out an online questionnaire.

“We are hoping to identify how often women struggle with fears of gaining weight or becoming overweight, and what factors contribute to these fears,” Mr Schembri said.

“The behaviours being examined include how often women try to avoid eating certain foods and whether they feel uncomfortable or distressed about other people seeing their bodies.”

“We’re also looking at body avoidance, where people actively avoid looking at their body in mirrors or reflections, often as a result of distress associated with body image dissatisfaction.”

Researchers hope to determine how these behaviours relate to the development of belief patterns that influence how women view themselves or how they perceive others may view them.

“It’s hoped that by examining these beliefs and associated behaviours, we will obtain a measure of the prevalence of women who may be susceptible to developing an eating disorder,” Mr Schembri said.

The online questionnaire is available at: www.rmit.edu.au/psychology/whatsreallyeatingyou

For more information about the study, email: adrian.schembri@student.rmit.edu.au
For interviews: Adrian Schembri, 0422 133 625.

For general media enquiries: RMIT University Media and Communications, Gosia Kaszubska, (03) 9925 3176 or 0417 510 735.
Appendix M

Copy of the May, 2009 Media Release
Body and weight issues burden Australian women: study

Australian women are struggling with their weight and body image, with an RMIT University survey showing 92 per cent experience ‘fat days’ and one in five regularly starve themselves to try and lose weight.

Preliminary findings from the *What’s Really Eating You* project, a nation-wide study by RMIT and La Trobe University, reveal Australian women have high levels of dissatisfaction with their body shape and weight.

Principal investigator Adrian Schembri said the initial results from the project’s online questionnaire indicated a disturbing number of women were at risk of developing eating disorders.

“We found that the women who are generally dissatisfied with their bodies actually check their bodies more often, creating a vicious cycle of repetitive checking rituals that fuel their feelings of anxiety and distress,” Mr Schembri said.

“While almost all the women surveyed said they felt fat on at least a few days in the past month, 43 per cent reported feeling fat every single day.

“About 21 per cent regularly ate nothing for eight hours or more in order to influence their weight, which is particularly alarming given research has shown that extended periods of fasting typically increase the risk of binge eating.”

The *What’s Really Eating You* project is examining whether a woman’s dissatisfaction with her body, shape and size contributes to risky behaviours and thought patterns associated with eating disorders such as anorexia, bulimia and binging.

More women are needed to take part in the research, by completing the anonymous questionnaire at: [www.rmit.edu.au/psychology/whatsreallyeatingyou](http://www.rmit.edu.au/psychology/whatsreallyeatingyou)

The 407 women who have so far participated in the survey range in age from 18 to 61, with 82 per cent aged 18 to 35. Other preliminary results include:

- 48 per cent of the women surveyed felt a strong desire to lose weight each day.
- 67 per cent were at least moderately uncomfortable about seeing their body in the mirror and shop reflections or while undressing, bathing or taking a shower.
• About one-third regularly used body checking techniques to help them to decide how much they could eat the following day. The most frequently checked body parts were the stomach, thighs and bottom.
• Just 12 per cent had no desire to lose weight and only 9 per cent reported that they were not at all dissatisfied with their weight.

For interviews: Adrian Schembri, 0422 133 625.

For general media enquiries: RMIT University Media and Communications, Gosia Kaszubska, (03) 9925 3176 or 0417 510 735.
Appendix N

Plain Language Statement – Clinical Sample
INVITATION TO PARTICIPATE IN A RESEARCH PROJECT
PROJECT INFORMATION STATEMENT

Project Title:
What's Really Eating You? Providing some Food for Thought

Investigators:
Primary investigator: Adrian Schembri
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Project Supervisor:
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Secondary Project Supervisor: Ms Trish Altieri
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Dear Participant,

You are invited to participate in a research project being jointly conducted by RMIT University and La Trobe University. This information sheet describes the project in straightforward language, or ‘plain English’. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators.

Who is involved in this research project? Why is it being conducted?
The current research is being conducted by Adrian Schembri as partial fulfilment of the Doctor of Psychology degree at RMIT University, under the supervision of Associate Professor David Smith, Professor Susan Paxton, and Ms Trish Altieri. This research has been approved by the RMIT University Human Research Ethics Committee and the Faculty of Science, Technology and Engineering Faculty Human Ethics Committee at La Trobe University. This study is being conducted collaboratively with the Division of Psychology at RMIT University and the School of Psychological Science at La Trobe University.

Why have you been approached?
We are interested in investigating the eating behaviours and psychological health of females aged 18 years and above. Individuals who meet these criteria have been approached and invited to participate.

What is the project about? What are the questions being addressed?
The present study aims to examine relationships that are associated with stress, eating, and anxiety, and identify various aspects of an individual’s lifestyle that are associated with eating behaviours, dietary restraint, and exercise. In particular, the thoughts, feelings, and behaviours that are associated with perceptions of body shape and weight will be investigated as well as the personality characteristics that relate to different coping styles.

If I agree to participate, what will I be required to do?
As a participant in this study, you will be asked to fill in a questionnaire booklet that will require approximately 20 minutes to complete. The questionnaire package contains
several demographic questions regarding your age, living arrangements, and level of
education. The questions also address eating and exercise behaviours, and thoughts
about shape and weight. Finally, the package enquires about your individual way of
cooping with stress and worry and some of the thoughts you may have in relation to
this.

You are encouraged to examine or browse through the questionnaire booklet as
it may aide in your decision to participate in the study. If you agree to participate, you
may complete the questionnaire online at http://www.rmit.edu.au/psychology/
whatsreallyeatingyou. Alternatively, you are welcome to complete the booklet via a pen
and paper questionnaire, which can be returned in the provided reply paid envelope.

**What are the risks associated with participation?**
Your decision to participate in the study or not will in no way affect your ongoing
treatment. Whilst there are no direct risks or disadvantages involved in your
participation in the present study, if you feel concerned about your responses to any of
the questionnaire items or if you find participating in the project distressing in any way,
you should contact Dr David Smith as soon as convenient on 9925 7523. Dr Smith will
discuss your concerns with you confidentially and suggest appropriate follow-up, if
necessary. Alternatively, you can contact the RMIT University Psychology Clinic on
9925 7603 or 9925 7376.

**What are the benefits associated with participation?**
Whilst there are no direct benefits for participating in this study, your input will provide
vital information regarding the relationships between our thoughts and feelings, and
how these are associated with behaviour, particularly eating and dietary behaviours.

**What will happen to the information I provide?**
The information that you provide will be kept at the RMIT University Bundoora West
campus in a locked filing cabinet for a period of five years. All information will remain
strictly confidential. Only the project investigators will have access to the questionnaire
packages. Any information that you provide can be disclosed only if (1) it is to protect
you or others from harm, (2) there is a legal requirement to do so, or (3) you provide
the researchers with written permission. The results obtained from within the
questionnaire booklets will be used in the compilation of a research report and may
appear in a journal publication in the future. However, only group data will be included
and under no circumstances will individual scores be reported.

**What are my rights as a participant?**
As a participant in this research, you have the right to have any questions answered at
any time. You also have the right to withdraw from the study prior to completion of the
questionnaire, without prejudice. You are welcome to read through this information
sheet and have a browse through the questionnaire prior to deciding whether you
would like to participate. Since this research is completely anonymous, there will not
be any identifying information located on your completed questionnaire package. As
such, it will not be possible to withdraw your questionnaire from the study once it has
been returned in the supplied reply paid envelope.

**Who should I contact if I have any questions?**
If you have any questions regarding this study, please feel free to contact Adrian
Schembri via email at adrian.schembri@student.rmit.edu.au. Alternatively, you are
welcome to contact Dr David Smith on 9925 7523 or via email at david.smith@rmit.edu.au.

If you have any complaints or queries that the researcher has not been able to answer to your satisfaction, you may contact the Ethics Liaison Officer, Faculty Human Ethics Committee, Faculty of Science, Technology and Engineering, La Trobe University, Victoria, 3086, (Ph: 9479 3698, e-mail: k.collins@latrobe.edu.au).

Yours sincerely,

Adrian Schembri
B.App.Sci (Psych)(Hons)

Susan Paxton
BA (Hons), MPsych., PhD

David Smith
B.B.Sc (Hons), MPsys., PhD

Trish Altieri
BA (Hons), MPsys.

Any complaints about your participation in this project may be directed to the Secretary, RMIT Human Research Ethics Committee, University Secretariat, RMIT, GPO Box 2476V, Melbourne, 3001. The telephone number is (03) 9925 1745. Details of the complaints procedure are available from the above address.
Appendix O

Online Questionnaire Informed Consent Statements

1. I have read the statements above, explaining the survey involved in this project.

2. I consent to participate in the survey titled the ‘What's Really Eating You?’, the particulars of which I have read about.

3. Having read the Plain Language Statement, I agree to the general purpose, methods and demands of the study.

4. I am aware that I am free to withdraw from the project at any time up until I submit my responses to the survey.

5. I understand that the project is for the purpose of research and may not be of direct benefit to me.

6. I understand that the confidentiality of the information I provide will be safeguarded and only disclosed where I have consented to the disclosure or as required by law.

7. I am aware that the security of the data is assured during and after completion of the study. The data of the study may be published, and a report of project outcomes will be provided to the School of Health Sciences (Division of Psychology), RMIT University. Any information which will identify me will not be used.

8. I understand that the group data collected during the study may be published.

9. I am aware that I will not be able to be identified from my responses.

10. I am 18 years of age or older.