The Role of Self-Objectification in the Development of Body Image Disturbance and Eating Disorder Symptomatology in Young Children

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Abstract

Eating disorders such as anorexia nervosa and bulimia nervosa are serious illnesses associated with severe psychological, physiological, and psychosocial impairments. Subclinical eating disorders and eating disorder symptoms affect a significant proportion of the female population and a smaller proportion of the male population. Recent evidence also supports the presence of clinically significant eating disorder symptoms in children (Madden, Morris, Zurynski, Kohn, & Elliot, 2009; Nicholls, Lynn, & Viner, 2011; Pinhas, Morris, Crosby, & Katzman, 2011). Given the pervasiveness of body image disturbance and the significant prevalence of eating disorder symptomatology among both males and females of all ages, there is a growing need to effectively prevent and treat eating disorders. Empirical studies identifying and delineating the risk and maintaining factors associated with eating disorders are therefore essential.

Researchers have identified a number of individual, interpersonal, biological, and sociocultural factors that appear to contribute to the development and maintenance of eating disorders. Of interest to this thesis was one specific individual factor, self-objectification, and how it interacts with other putative risk factors to predict eating disorder symptoms. Whilst this putative risk factor has received adequate attention in young adult populations, the etiological significance of self-objectification in the development of body surveillance, body image disturbance, and disordered eating in young children has not been clearly established. Accordingly, within the context of objectification theory, this thesis aimed to longitudinally examine the role of self-objectification in the development of eating disorder symptoms in 6- to 11-year-old boys and girls. This aim was accomplished in three broad studies.

The first study of this thesis (Chapter 3) modified currently available measures of self-objectification (Self-Objectification Questionnaire; SOQ) and objectified body
consciousness (Objectified Body Consciousness Scale for Youth; OBC-Y) in adults and adolescents for use with a child sample. The psychometric properties of these modified measures were then examined. Results suggest that scores on modified versions of the OBC-Y and SOQ may provide researchers with psychometrically sound measures of the key components of objectification theory in children (particularly girls), thereby facilitating the research conducted in Study 2.

The second study of this thesis (a) examined the degree to which children self-objectify and the prevalence of body image disturbance and eating disorder symptomatology in this population (Chapter 4, Study 2a); (b) cross-sectionally and longitudinally examined objectification theory as it pertains to the development of disordered eating (Chapter 5, Study 2b) and depressed mood (Chapter 6, Study 2c) in children; and (c) examined the possible protective role of self-esteem within the objectification theory framework (Chapter 7, Study 2d). Results from Study 2a suggest that young girls self-objectify to a similar degree as older females, supporting the proposition that young girls, like adults, are vulnerable to the messages of objectification that permeate Western societies. Boys were also found to self-objectify, and both boys and girls reported experiencing body image disturbance and eating disorder symptoms.

Results from Studies 2b and 2c provide support for the validity of objectification theory in children, with the overall framework of objectification theory as it pertains to the development of eating disorder symptoms and depressed mood receiving substantial cross-sectional support. Prospective support was found for the relationship between body shame and dietary restraint, and between body surveillance, body dissatisfaction, and dietary restraint. Although gender differences were observed, certain aspects of objectification theory as it pertains to the development of eating disorder symptoms
were applicable to both sexes, suggesting that objectification theory is not a framework that should be exclusively applied to females.

Self-esteem emerged as a significant protective factor within the relationships examined by Study 2d. Results revealed that several of the relationships posited by objectification theory were significant only among individuals with low self-esteem, suggesting that self-esteem may be a potential target for prevention and intervention programs.

The third study of this thesis used projective techniques to investigate whether young girls assimilate the objectification depicted in the images to which they may be exposed. Results of Study 3 (Chapter 8) suggest that girls, even those as young as 6 years of age, may have already assimilated objectification and developed some implicit attitudes towards objectifying content, with consistent differences observed in the way girls describe depictions of objectified and non-objectified peers.

Collectively, the six empirical studies provide insight into the validity of objectification theory in young boys and girls. These studies also add to the growing body of evidence that body image disturbance and eating disorder symptomatology are present in young children.
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Statement of Candidate Contribution

This thesis is my own work and all external sources have been acknowledged.

The research present in Appendix A was conducted in collaboration with other research groups and these groups have been outlined on the preceding Acknowledgements page.

For all other studies, I was involved in the design and planning of the research, data collection and entry, data analysis and interpretation, and the write-up of results.
Publications Arising From This Thesis


I have the permission of all co-authors to include this work in my thesis. For all papers, the first author (MJ) was responsible for the design and planning of the study, data entry, data analysis and interpretation, the write-up of results, and preparation of manuscripts for review. Co-authors provided supervision or advice regarding this process (SB and SP) and/or were involved in previous studies that facilitated the research (KA and FW).
Chapter 1. Introduction

1.1. Background to the Thesis

Eating disorders are the third most common chronic illness in teenage girls (Golden et al., 2003; Lucas, Beard, O'Fallon, & Kurland, 1991). In Australia, 1 in 5 teenage girls experiences some form of disordered eating (O'Dea, 2007), and eating disorder symptoms have been observed in children as young as 5 years of age (Davison, Markey, & Birch, 2003; Madden, Morris, Zurynski, Kohn, & Elliot, 2009). In a recent survey of almost 46,000 11- to 24-year-old Australians, 34% of respondents indicated that body image (i.e., the internalised representation of weight, shape, and appearance; Thompson, Roehrig, Cafri, & Heinberg, 2005) was the number one concern in their lives (Mission Australia, 2012). Given the pervasiveness of body image disturbance and the significant prevalence of eating disorder symptomatology among both males and females, investigating the predictors and psychological mechanisms that underpin the development of eating disorder symptoms is imperative.

Researchers have identified a number of individual, interpersonal, biological, and sociocultural factors that appear to contribute to the development and maintenance of eating disorders. Of interest to this thesis was one specific individual factor, self-objectification, and how it interacts with other factors to predict the development and maintenance of eating disorder symptoms. Self-objectification occurs when individuals internalise a critical observer’s perspective of their physical selves, and adopt a view of themselves as objects whose value is dependent on their appearance (Fredrickson & Roberts, 1997). Fredrickson and Roberts (1997) conceptualised self-objectification as both a state and a trait. State self-objectification is contextually enhanced self-objectification that fluctuates depending on one’s situation. It is heightened in situations that increase one’s awareness of an outside observer’s perspective of the body. By contrast, trait self-objectification is determined by the extent to which the critical
observer’s perspective has been internalised (Harper & Tiggemann, 2008). According to objectification theory, self-objectification as an individual trait manifests as a habitual monitoring of appearance and has several negative psychological consequences (Fredrickson & Roberts, 1997). Whilst theoretical models that account for self-objectification and its association with eating disorder symptomatology have been proposed and investigated in older populations, few investigations of self-objectification have been conducted in children. As such, the role of self-objectification in the development of cognitive and behavioural eating disorder symptoms, and potential gender differences in the experience of self-objectification, are poorly understood in this population.

Accordingly, this thesis aimed to extend and integrate previous research on self-objectification and the role it plays in the development of eating disorder symptoms. Specifically, this thesis examined the consequences of self-objectification, as proposed by objectification theory, in a sample of young boys and girls through the longitudinal testing and evaluation of proposed theoretical models. This thesis focused on trait self-objectification as opposed to state self-objectification given the ethical implications of exposing young children to situations that may increase preoccupation with their body’s physical appearance. Additionally, the framework of objectification theory focuses on self-objectification as a trait and the role that it plays in the development of negative psychological consequences. Given this thesis aimed to examine the consequences of self-objectification as proposed by objectification theory, the theory’s conceptualisation of self-objectification as a trait was respected.

Central to this thesis were the following overarching propositions, discussed in greater detail in Chapter 2:

1. Self-objectification is a risk factor in the development of body image disturbance and eating disorder symptoms in children.
2. Interactions between the consequences of self-objectification, such as habitual body monitoring, body shame, and weight and shape concern, form complex models that explain the relationship between self-objectification and eating disorder symptomatology in children.

1.2. Structure of the Thesis

This thesis is comprised of three main sections: two introductory chapters, six empirical chapters, and one general discussion chapter. The remainder of the present chapter provides a general introduction to eating disorders and eating disorder symptomatology. Subsequently, Chapter 2 provides a thorough review of the objectification theory literature, and presents a developmental framework for the potential role of self-objectification in the development and maintenance of body image disturbance and eating disorder symptoms in children.

The second section presents Chapters 3 through 8 which comprise the three major studies that were conducted for this thesis. Specifically, Chapter 3 comprises Study 1 which examined the psychometric properties of two modified measures of self-objectification in a sample of 6- to 11-year-old children. In this study, the validity, reliability, and factor structure of the Objectified Body Consciousness Scale for Youth (Lindberg, Hyde, & McKinley, 2006) and the Self-Objectification Questionnaire (Noll & Fredrickson, 1998) were investigated to examine the utility of these measures in a child sample. Using these two measures, this study also cross-sectionally examined the relationship of gender, age, and body mass index (BMI) with self-objectification, body surveillance, and body shame in the same sample of children.

Broadly, Study 2 cross-sectionally and longitudinally examined objectification theory in a sample of children. Study 2 comprised four substudies. Study 2a (Chapter 4) examined the degree to which Australian children self-objectify and the prevalence of body image disturbance and eating disorder symptoms in this population. Study 2b
(Chapter 5) utilised structural equation modelling techniques to cross-sectionally and longitudinally test two theoretical models of objectification theory that account for the role of self-objectification in the development of eating disorder symptoms. Study 2c (Chapter 6) evaluated an extended theoretical model of objectification theory that accounts for the role of self-objectification in the development of both eating disorder and depressive symptoms. Finally, as previous research has not adequately examined the influence of self-objectification on general psychological well-being, and the potential protective function of self-esteem within the objectification theory framework, Study 2d (Chapter 7) examined the moderating effect of self-esteem on the associations posited by objectification theory.

The third major study of this thesis, Study 3 (Chapter 8), took the form of a mixed-method qualitative and quantitative study that allowed for an in-depth understanding of how the concept of objectification is assimilated in young girls. Specifically, this study utilised projective techniques to explore young girls’ assimilation of the objectification depicted in the images they may encounter and the meaning they may subconsciously attach to these images.

A general discussion of the findings from all studies is presented in Chapter 9. Implications of the findings for prevention programs and treatment protocols are presented and conclusions drawn.

The remainder of the present chapter focuses on the key features of eating disorders, their prevalence and epidemiology, and their course and outcome. An examination of the prevalence of eating disorder symptoms in young children is also provided.

1.3. Background to Eating Disorders

1.3.1. Key features and diagnostic categories. According to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV; American Psychiatric Association
Eating disorders can be classified into three main categories: anorexia nervosa (AN), bulimia nervosa (BN), and eating disorder not otherwise specified (EDNOS). AN is characterised by: (a) a refusal to maintain body weight at or above a minimally normal weight for age and height; (b) an intense fear of gaining weight or becoming fat; and (c) disturbance in the way body weight or shape is experienced, with self-evaluation influenced primarily by body weight and shape. In postmenarcheal females, the presence of amenorrhea is also a criterion. AN is categorised into two subtypes: restricting type, if there are no episodes of binge eating or purging behaviour, and binge eating/purging type, if the individual regularly engages in binge eating or purging behaviour during the current episode of AN (APA, 1994).

BN is characterised by (a) recurrent episodes of binge eating and (b) recurrent, inappropriate compensatory behaviours intended to prevent weight gain, such as self-induced vomiting and/or excessive and compulsive exercise (APA, 1994). As with AN, self-evaluation is overly influenced by body weight and shape. BN is categorised into two subtypes: purging type, if the recurrent compensatory behaviours include self-induced vomiting or the misuse of laxative and diuretics, and nonpurging type, if the compensatory behaviours are characterised by fasting or excessive exercise (APA, 1994).

EDNOS is given as a diagnosis to any eating disorder of clinical severity that does not meet the full diagnostic criteria for AN or BN (Fairburn & Bohn, 2005). Included in the EDNOS category is binge eating disorder (BED), described in the DSM-IV as recurrent episodes of binge eating with the absence of inappropriate compensatory behaviours (APA, 1994). Although individuals diagnosed with EDNOS do not meet full criteria for AN or BN, studies comparing full-syndrome AN and BN with EDNOS have found few clinical and psychosocial differences (Kendler et al., 1991; Lewinsohn, Striegel-Moore, & Seeley, 2000). This suggests that individuals with
EDNOS experience significant and debilitating cognitive psychopathology and psychosocial impairment that is comparable to those individuals diagnosed with AN or BN (Fairburn & Bohn, 2005; Turner & Bryant-Waugh, 2004).

The DSM-5 psychiatric classificatory system, released in 2013, recognises three eating disorders: AN, BN, and BED (APA, 2013). Residual categories of other specified feeding or eating disorder and unspecified feeding or eating disorder are also recognised. These categories will not be described in any further detail as the DSM-5 is yet to be widely implemented.

The following sections review the literature examining the prevalence and incidence of eating disorders, their course and outcome, and epidemiology. For each section, the general literature is reviewed, followed by specific references to child samples where relevant. For the purposes of clarity, the use of the term ‘children’ throughout this thesis refers to those in middle childhood, approximately 6 to 12 years of age.

1.3.2. Prevalence and incidence of eating disorders.

1.3.2.1. Prevalence. It is difficult to accurately estimate the prevalence of eating disorders as many individuals conceal their illness and avoid seeking professional help (Fairburn & Harrison, 2003; Hoek, 2006). As a result, rates based on detected cases in clinical samples are likely to underestimate the prevalence of these disorders. By contrast, population-based studies relying on self-report data in anonymous conditions are thought to overestimate the prevalence of eating disorder traits (Kortegaard, Hoerder, Joergensen, Gillberg, & Kyvik, 2001). As such, a two-stage screening approach is the current standard for the assessment of eating disorder prevalence (Hoek & van Hoeken, 2003). The first stage involves screening a large population for the likelihood of an eating disorder. In the second stage, those believed to be cases of eating disorders based on their responses in the screening are clinically interviewed.
Studies using the two-stage screening methodology or that assess for eating disorders using standardised clinical interviews have found prevalence estimates for full-syndrome AN that range between 0% and 1.9% in females and 0% and 0.30% in males (Bulik et al., 2006; Cotrufo, Gnisci, & Caputo, 2005; Hudson, Hiripi, Pope Jr, & Kessler, 2007; Machado, Machado, Gonçalves, & Hoek, 2007; Preti et al., 2009; Rojo et al., 2003; Stice, Marti, Shaw, & Jaconis, 2009; Striegel-Moore et al., 2003; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011; Wade, Bergin, Tiggemann, Bulik, & Fairburn, 2006). Prevalence estimates for full-syndrome BN range between 0.30% and 2.3% in females and 0% and 1.0% in males (Cotrufo et al., 2005; Hudson et al., 2007; Keski-Rahkonen et al., 2009; Machado et al., 2007; Preti et al., 2009; Rojo et al., 2003; Stice et al., 2009; Striegel-Moore et al., 2003; Swanson et al., 2011).

Most individuals who seek help for an eating disorder do not meet the full diagnostic criteria for AN or BN (Machado et al., 2007). As such, EDNOS is the most common category of eating disorder in outpatient settings, with prevalence estimates of around 2.6% in both males and females (Beato-Fernández, Rodríguez-Cano, Belmonte-Llario, & Martínez-Delgado, 2004; Machado et al., 2007). Reported rates for BED range between 0.10% and 2.30% in females and 0.26% and 0.8% in males (Cotrufo et al., 2005; Hudson et al., 2007; Machado et al., 2007; Preti et al., 2009; Stice et al., 2009; Swanson et al., 2011). In a population-based study examining changes in eating disorder prevalence in Australia over the decade from 1995 to 2005, eating disorders (particularly BED) were found to be increasing in point prevalence (Hay, Mond, Buttner, & Darby, 2008). This finding was consistent among both genders, with a two-fold increase in the prevalence of binge eating, purging, and strict dieting or fasting for weight and shape control noted in males and females.

Few prevalence studies have been conducted in children. As such, overall prevalence rates of eating disorders are difficult to estimate in this population, although
recent studies on 12-month eating disorder prevalence in boys and girls have reported rates between 0% and 0.15% (Ford, Goodman, & Meltzer, 2003; Merikangas et al., 2010).

1.3.2.2. Incidence. Average incidence rates for AN and BN have been estimated at 8 per 100 000 and 13 per 100 000 respectively (Hoek, 2006). A significant increase in the incidence of AN has been observed among 10- to 14-year-old and 15- to 19-year-old girls for each decade since the 1950s (Hoek & van Hoeken, 2003; Smink, van Hoeken, & Hoek, 2012). In studies on children, early-onset eating disorders were found to affect 1.4 to 3.01 cases per 100 000 (Madden et al., 2009; Nicholls, Lynn, & Viner, 2011; Pinhas, Morris, Crosby, & Katzman, 2011). Incidence increases substantially with age, with an estimated overall incidence of 0.21 per 100 000 for 6- to 7-year-olds and 7- to 8-year-olds, increasing to 0.92 per 100 000 for 8- to 9-year-olds, 1.64 per 100 000 for 9- to 10-year-olds, 3.56 per 100 000 for 10- to 11-year-olds, 4.46 per 100 000 for 11- to 12-year-olds, and 9.51 per 100 00 for 12- to 13-year-olds (Nicholls et al., 2011). As in adult populations, the incidence of EDNOS in children is higher than the incidence of AN or BN (1.22 per 100 000 for EDNOS compared to 1.09 per 100 000 for AN and 0.04 per 100 000 for BN; Nicholls et al., 2011).

1.3.3. Course and outcome. Eating disorders are serious and persistent psychiatric illnesses associated with considerable morbidity and mortality (Golden et al., 2003; Steinhausen, 2009). Crude mortality rates range from 0% to 18.2% for AN (Clausen, 2008; Fichter, Quadflieg, & Hedlund, 2006; Herzog et al., 2000; Keel et al., 2003; Lee, Chan, & Hsu, 2003; Löwe et al., 2001; Tanaka, Kiriike, Nagata, & Riku, 2001) and 0.9% to 2.0% for BN (Fichter & Quadflieg, 2004; Keel et al., 2003). Mortality risk is significantly lower in BN and EDNOS compared to AN (Arcelus, Mitchell, Wales, & Nielsen, 2011; Keel & Brown, 2010; Quadflieg & Fichter, 2003).
Studies of the long-term course and outcome of individuals with eating disorders suggest that a significant minority of these individuals will still meet diagnostic criteria for an eating disorder of some type more than 12 years after initial diagnosis (Fichter et al., 2006; Keel & Brown, 2010). There is a considerable degree of cross-diagnostic shift, with individuals frequently moving from one diagnosis to another (Fairburn & Bohn, 2005).

Results from prospective cohort and case series studies have shown that 30% to 59% of individuals with AN and 51% to 74% of individuals with BN will no longer meet criteria for any eating disorder 4 to 12 years post-treatment (Ben Tovim et al., 2001; Bulik, Sullivan, Fear, & Pickering, 2000; Fairburn, Cooper, Doll, Norman, & O’Connor, 2000; Fichter & Quadflieg, 2004; Fichter et al., 2006; Jäger, Liedtke, Lamprecht, & Freyberger, 2004; Lee et al., 2003). It must be noted, however, that these individuals still exhibit certain pathological attitudes and differ significantly from healthy controls on measures of body image, general psychopathology, social integration, and psychosocial difficulties (Fichter et al., 2006). Furthermore, comorbid psychiatric disorders, most notably depressive disorders, anxiety disorders, and obsessive-compulsive disorder, are seen in a large proportion of individuals with AN and BN at follow-up (Herpertz-Dahlmann et al., 2001; Holtkamp, Müller, Heussen, Remschmidt, & Herpertz-Dahlmann, 2005).

In children, studies examining the course and outcome of BN are limited. For AN, recovery has been observed in 65% of children at 6-year follow-up and 91% of children at 12-year follow-up (Theander, 1996). In determining outcome, the Morgan-Russell General Scale is typically used. This scale assesses five areas of a patient's state: nutritional status, menstrual status, mental state, psychosexual status, and socioeconomic status (which examines a patient’s relationships with their families, capacity to confide, capacity for group leisure, and capacity to study full time). Global
Morgan-Russell scores for children with AN suggest a good outcome in 30% to 65% of cases, an intermediate outcome in 13% to 35% of cases, and a poor outcome in 20% to 39% of cases (Bryant-Waugh, Knibbs, Fosson, Kaminski, & Lask, 1988; Higgs, Goodyer, & Birch, 1989; Walford & McCune, 1991).

In children, mortality rates of 0% to 5% have been observed (Bryant-Waugh et al., 1988; Hawley, 1985; Higgs et al., 1989; Pla & Toro, 1999; Theander, 1996). Prepubertal onset of eating disorders has also been found to significantly affect childhood development, elevating the risk of significant and often long-term psychological, physiological, and physical problems in the form of stunted growth, delayed puberty, osteopenia, osteoporosis, menstrual irregularities, chemical imbalances, malnutrition, and impaired social functioning (Gowers, Crisp, Joughin, & Bhat, 1991; Higgs et al., 1989; Mallick, 1983; Pugliese, Lifshitz, Grad, Fort, & Marks-Katz, 1983; Zipfel et al., 2001). These findings, combined with the consistent observation that prepubertal age of onset is an unfavourable prognostic indicator of AN (Berkman, Lohr, & Bulik, 2007; Keel & Brown, 2010; Steinhausen, 2009), suggest that the identification of potential eating disorder cases in children is important.

1.3.4. Eating disorder symptomatology. Eating disorder symptoms refer to a variety of attitudes, cognitions, emotions, and behaviours that are characteristic of eating disorders, such as body dissatisfaction (the subjective negative evaluation of one’s body or body parts; Stice & Shaw, 2002), fear of fatness, overconcern with the control of weight and shape (preoccupation with issues relating to weight and shape and the evaluation of self-worth largely in terms of weight and shape or the control of weight and shape; Fairburn, Cooper, & Shafran, 2003), preoccupation with food, restrained eating, excessive and compulsive exercise, binge eating, and purging (Cooper & Fairburn, 1993; Franko & George, 2009; D. M. Garner & Garfinkel, 1979). Given the considerable overlap that exists between individuals diagnosed with an eating disorder...
and those who do not meet the full clinical criteria for an eating disorder but experience eating disorder symptoms, it is argued that eating pathology and disturbances can be conceptualised along a continuum, with unrestrained eating at one end, full-syndrome clinical eating disorders at the other end, and other forms of disturbed eating and eating disorder cognitions of varying intensities in between (Nasser & Katzman, 2003; Stice, Ziemba, Margolis, & Flick, 1996; Tylka & Subich, 1999).

The significant prevalence of subthreshold levels of body image disturbance and eating disorder symptoms in adults, adolescents, and children highlights the importance of research that focuses on the full continuum of eating disorder symptoms, rather than the diagnostic categories. This is particularly the case with children, where 3% to 14% achieve scores on eating disorder measures such as the Children’s Eating Attitudes Test (ChEAT; Maloney, McGuire, & Daniels, 1988) that are indicative of an individual being at an increased risk for the development of an eating disorder (Halvarsson & Sjödèn, 1998; McVey, Tweed, & Blackmore, 2004; Schur, Sanders, & Steiner, 2000; Thomas, Ricciardelli, & Williams, 2000). Subclinical weight concerns and body dissatisfaction at ages 5 to 7 also predict the development of maladaptive eating attitudes, dieting, and other forms of restrained eating in later childhood, independent of weight status (Davison et al., 2003). This suggests that if children are set on a trajectory of body dissatisfaction and body image concerns prior to adolescence, it is probable that their susceptibility to precipitating factors in adolescence will be increased. They may also be at increased risk of experiencing negative affect and disordered eating in preadolescence, that is, prior to the expected increases in adolescence (Ohring, Graber, & Brooks-Gunn, 2002). Studies of children have therefore focused primarily on the prevalence of unhealthy eating behaviours and body image disturbance because (a) it is likely these precede the onset of full-syndrome eating disorders and (b) it is presumed...
that these behaviours are more common in children than the more extreme behaviours associated with AN and BN (Littleton & Ollendick, 2003).

Various studies examining subthreshold levels of body image disturbance and disordered eating in children have indeed concluded that these behaviours are fairly common. Body dissatisfaction, for example, is reported by 32% to 55% of girls and 15% to 44% of boys (Berger, Schilke, & Strauss, 2005; Clark & Tiggemann, 2008; Dohnt & Tiggemann, 2006; McVey, Tweed, et al., 2004; Olvera, Suminski, & Power, 2005; Ricciardelli & McCabe, 2001a; Ricciardelli, McCabe, Holt, & Finemore, 2003). Body dissatisfaction associated with muscularity is also common, with approximately 38% of girls and 60% of boys rating their muscles as important (Ricciardelli et al., 2003), and 14% of girls and 29% of boys worrying about the size of their muscles (Holt & Ricciardelli, 2002).

Consistent with research linking body image concerns to weight-loss or muscle-building strategies (Ricciardelli et al., 2003), a significant proportion of boys and girls report engaging in the behavioural components of eating disorders. For example, between 18% and 25% of boys and girls are trying, or have tried, to lose weight (Berger et al., 2005; McVey, Tweed, et al., 2004). Approximately 44% try to lose weight by dieting or restricting their food intake (Ricciardelli et al., 2003), whilst 43% to 59% try to lose weight or change their body shape and size by exercising (Ricciardelli, McCabe, & Banfield, 2000). Between 53% and 72% of children report exercising to increase muscularity (Ricciardelli et al., 2000; Ricciardelli et al., 2003).

A significant minority of children also engage in more extreme body change strategies. Between 20% and 50% of boys and girls report skipping meals to lose weight, and approximately 21% starve themselves at least sometimes (Koff & Rierdan, 1991; Shapiro, Newcomb, & Loeb, 1997; Shisslak et al., 1998). Using the gold-standard Children’s Eating Disorder Examination (Bryant-Waugh, Cooper, Taylor, & Lask,
Tanofsky-Kraff et al. (2004) found that 6.2% of boys and girls reported engaging in objective binge eating episodes, 3.1% reported engaging in subjective binge eating episodes, and 20.4% reported engaging in objective overeating. Self-induced vomiting is reported by approximately 1% to 7% of girls (Combs, Pearson, & Smith, 2011; McVey, Tweed, et al., 2004). Self-induced vomiting has also been observed in boys (Madden et al., 2009; Pinhas et al., 2011); however, estimates are limited by the clinical nature of these studies. Population-based studies, such as those conducted in girls, are lacking.

Unfortunately it is difficult to generalise on the above findings as the studies cited use widely varying sample sizes (\( N = 39 \) to \( N = 2279 \)), with smaller studies potentially inflating statistics. Additionally, it appears that researchers have yet to agree on a standardised method for assessing the cognitions and behaviours of interest and, as such, use a variety of measures in their assessments. For example, with respect to the assessment of body dissatisfaction, some researchers have used a variety of figure rating scales whilst others have used clinical interviews. With respect to the assessment of disordered eating behaviours, such as dieting, different definitions of the term dieting are used across studies, resulting in the use of different assessment techniques. Finally, researchers have yet to develop a validated assessment of body dissatisfaction associated with muscularity. A problem with figure rating scales is that they do not distinguish between increased size due to muscle and increased size due to fat (Cohane & Pope, 2001). As such, a desire to be larger does not necessarily equate to a desire to be more muscular (Ricciardelli & McCabe, 2001a, 2004).

Despite these limitations, the above findings suggest that a sizable percentage of children experience body dissatisfaction and actively engage in unhealthy eating behaviours. Young children also appear to be aware of dieting as a means to lose weight, and a significant minority engage in anorexic and bulimic behaviours. Another
finding to emerge from research into eating disorder symptoms in young children relates
to the proportion of healthy-weight children who perceive themselves as being
overweight and engage in weight-loss behaviours. Although overweight children
typically report significantly higher weight concerns, shape concerns, eating concerns,
and dietary restraint than healthy-weight children (Burrows & Cooper, 2002), multiple
studies have found that a significant minority of healthy-weight and underweight
children think they are too fat, desire a figure thinner than their own, report a drive for
thinness, are preoccupied with food, feel guilty after eating, and engage in maladaptive
weight-loss behaviours, such as skipping meals, fasting, counting calories, and
exercising (Berger et al., 2005; M. E. Collins, 1991; Davison et al., 2003; Field,
Rierdan, 1991; Kostanski & Gullone, 1999; O'Dea & Caputi, 2001; Rolland, Farnill, &
Griffiths, 1997; Roncolato, Huon, Braganza, & Ritchie, 1998). This suggests that even
children within the healthy weight range may desire and strive for a thinner body weight
and shape, putting them at risk for the development of malnutrition and other physical
problems (Gowers et al., 1991; Higgs et al., 1989; Mallick, 1983; Pugliese et al., 1983;
Zipfel et al., 2001).

1.3.5. Epidemiology: Effects of gender, age, and ethnicity. Although all
individuals can be affected by an eating disorder, higher rates of eating disorders and
eating disorder symptoms have been observed in certain groups that appear to be
particularly vulnerable. Influencing vulnerability is an individual’s gender, age, and
ethnicity.

1.3.5.1. Gender. Eating disorders affect a significantly higher number of females
than males, with current estimates suggesting that approximately 90% of individuals
with AN or BN are female (Fairburn & Harrison, 2003; Hoek & van Hoeken, 2003). In
early-onset eating disorders, the gender distribution is less skewed, with various studies
reporting that 19% to 30% of their early-onset eating disorder sample is male (Fosson, Knibbs, Bryant-Waugh, & Lask, 1987; Hawley, 1985; Higgs et al., 1989).

Despite the marked gender differences in the prevalence of AN and BN in adults, studies comparing the clinical presentations of males and females have found that males and females are strikingly similar in terms of psychiatric comorbidity, and do not differ significantly on psychometric measures and behavioural criteria for weight, binge frequency, and vomiting frequency (Woodside et al., 2001; Woodside & Kaplan, 1994). Research findings do, however, suggest a significant difference in drive for thinness and body shape; males, including boys, are more likely than females to desire a muscular and toned physique as opposed to thinness (Bryant-Waugh & Lask, 2013; Jones, Bain, & King, 2008; Weltzin et al., 2005). Males are also more likely to engage in excessive exercise as a means of weight control, whereas females are more likely to engage in caloric restriction and laxative misuse (Bayes & Madden, 2011; Sharp, Clark, Dunan, Blackwood-Douglas, & Shapiro, 1994; Weltzin et al., 2005).

1.3.5.2. Age. Eating disorders are considered to be disorders of adolescence and early adulthood, with epidemiological studies revealing that onset commonly occurs between the ages of 10 and 20 (Preti et al., 2009). For AN specifically, mean age of onset occurs between 16.8 and 18.9 years (Favaro, Caregaro, Tenconi, Bosello, & Santonastaso, 2009; Hudson et al., 2007). Risk for BN extends into early adulthood, with a characteristic peak of onset between 19.0 and 19.7 years (Favaro et al., 2009; Hudson et al., 2007).

Whilst onset of AN and BN occurs almost exclusively during adolescence and early adulthood, onset can (and does) occur at any time throughout the lifespan. Recent studies have reported the development of AN in children as young as 5 years of age (Madden et al., 2009; Pinhas et al., 2011), and case studies have reported the onset of AN in adults over the age of 30 (D. Beck, Casper, & Andersen, 1996; Joughin, Crisp,
Gowers, & Bhat, 1991). Cases of BN onset occurring in prepubertal children have also been reported, though these are rare (Bryant-Waugh & Lask, 2013; Cooper, Watkins, Bryant-Waugh, & Lask, 2002).

A growing body of literature on early-onset eating disorders suggests that the phenomenological form of AN and BN and the core behavioural, psychological, and physical features of these disorders in prepubertal children are similar in nature to those observed in older adolescents and adults. The symptoms of weight loss and low weight, food avoidance, preoccupation with food and weight, fear of weight gain and fatness, misperception of body shape and size, overexercising, and self-induced vomiting have all been identified in children with eating disorders (Cooper et al., 2002; Madden et al., 2009; Nicholls et al., 2011; Pinhas et al., 2011; Watkins & Lask, 2009).

1.3.5.3. Ethnicity. Although it has been suggested that eating disorders occur with greater frequency among Caucasians than among other populations (Striegel-Moore et al., 2003), this view has recently been challenged. Evidence suggests that the prevalence of eating disorder attitudes and behaviour (such as restrictive eating, binge eating, and self-induced vomiting) in groups such as African Americans, Hispanics, Asian Americans, and Native Americans, is comparable to, and in some studies significantly greater than, prevalence rates of these symptoms in Caucasians (Barry & Grilo, 2002; Bisaga et al., 2005; Crago & Shisslak, 2003; W. G. Johnson, Rohan, & Kirk, 2002; Neumark-Sztainer et al., 2002; Robinson, Chang, Haydel, & Killen, 2001; Striegel-Moore et al., 2000). These findings are supported in a meta-analysis by O'Neill (2003), who found that Black (specifically, African American) females did not differ significantly from White females in their risk of BN and BED, suggesting that African American females may be at greater risk of developing eating disorders than previously recognised.
Eating disorders are, however, diagnosed more frequently in individuals from Western and industrialised societies where thinness is idealised and valued (Fairburn & Harrison, 2003; Fairburn, Shafran, & Cooper, 1999). It has been suggested that the emergence of eating disorders in adults and children from African, Asian, and Chinese populations may be due to the migration of these individuals to Westernised societies and cultures (Fairburn & Cooper, 1982) or the increasing Westernisation of societies where Western ideals were not previously endorsed (Lai, 2000; Lee & Lee, 2000; Striegel-Moore & Franko, 2002).

1.4. Summary

There is evidence to suggest that the incidence of eating disorders, specifically AN, is increasing in adolescents and children. In addition, clinically significant levels of cognitive and behavioural eating disorder symptoms have been observed in a significant minority of girls and boys. For young children, the physical, psychological, and social consequences associated with early-onset eating disorders and eating disorder symptomatology are particularly severe as, if undetected and untreated, they may face a lifelong struggle to manage their symptoms (Lask, Waugh, & Gordon, 1997). The investigation and early detection of eating disorder cognitions and behaviours in children, and the development of intervention and prevention programs that target negative body image at a young age, is of vital importance if subthreshold cognitive and behavioural eating disorder symptoms are to be prevented from developing into full syndromes. Research on the risk factors associated with eating disorder symptoms in children is crucial to informing these prevention and treatment programs and identifying those individuals who may be particularly at risk for the development of an eating disorder. In the following chapter, factors identified as playing a role in the development of eating disorders and eating disorder symptomatology are discussed, with particular attention given to one such risk factor, self-objectification.
2.1. Overview

As noted in Chapter 1, eating disorders are a source of significant mortality and morbidity and have been linked to a range of psychosocial, psychological, and physiological problems (Fichter et al., 2006; Golden et al., 2003; Steinhausen, 2009). Subthreshold eating disorder symptoms and body image disturbance have also been linked to a range of psychological problems and are proximal risk factors for the development of eating disorders (Taylor et al., 1998). As this thesis aimed to examine the potential risk factor of self-objectification and how it contributes to the development of these subthreshold eating disorder symptoms and body image disturbance in children, this chapter begins by introducing the general principles of risk factor research, before briefly reporting on specific putative risk factors that have been examined by previous research studies. A detailed account of objectification theory is also provided. To extend this body of work to children, a theoretical framework is introduced that includes an account of how developmental and social-cognitive theories may explain the influence of objectification and the applicability of objectification theory in children. This chapter culminates in a description of the gaps in the literature and how they were addressed in this thesis.

2.2. Risk Factor Research: General Principles

A risk factor is a measurable characteristic of each subject in a specified population that is associated with a particular outcome statistically and clinically, precedes the outcome of interest, and divides said population into groups: high-risk and low-risk (Kraemer et al., 1997). In samples characterised by the occurrence of a particular risk factor or by a combination of risk factors, the probability of a particular
outcome developing should be significantly higher than in samples that are not
characterised by those risk factors.

Whilst the identification of factors associated with a particular disorder is
straightforward, the determination of whether these factors are causally related to the
disorder is more difficult. In eating disorders, it is especially difficult to differentiate
between risk factors, early symptoms, correlates, and consequences, particularly if
research is cross-sectional in nature. Although cross-sectional studies are useful for
identifying putative risk factors that can be definitively examined in subsequent
longitudinal or experimental studies (Jacobi, Hayward, de Zwaan, Kraemer, & Stewart,
2004), they do not attempt to identify whether the putative risk factor or the outcome
occurred first, violating the crucial temporal precedence criterion. Furthermore, cross-
sectional studies fail to take into account the impact of initial levels of the outcome of
interest, and as such, the predictive utility of the putative risk factors may be
overestimated (Eack & Newhill, 2007). By contrast, prospective studies allow for a
demonstration of precedence, making them superior to cross-sectional studies in their
ability to determine the risk factors associated with the pathogenesis of a disorder and
ideal methodological designs for examining the specific mechanisms by which a risk
factor leads to a given disorder (Jacobi et al., 2004; Kraemer et al., 1997).

2.3. Variables Linked to the Development of Eating Disorders

The causes of eating disorders and eating disorder symptoms are complex and
multifactorial. No single etiological variable can fully explain the emergence of eating
disorders. Rather, it is an interaction of genetic, biological, familial, psychological,
individual, and sociocultural factors that are linked to eating disorder development and
maintenance (Pearson, Goldklang, & Striegel-Moore, 2002).

A burgeoning scientific interest in eating disorders in recent years has resulted in
important conceptual and empirical advances in the understanding of the variables
associated with body image disturbance and disordered eating. Whilst the variables of
gender (specifically, being female), weight concerns, negative body image, and dieting
are well-established risk factors for eating disorders (Jacobi et al., 2004), many more
variables have been proposed as putative risk factors that await further examination. In
addition to genetic factors (Bulik et al., 2006; Grice et al., 2002; Javaras et al., 2008;
Klump, Miller, Keel, McGue, & Iacono, 2001), biological factors implicating the
serotonergic systems and body weight or body mass index (BMI) have been proposed to
result in eating disorders (Jacobi et al., 2004; Kaye et al., 2005; Kotler, Cohen, Davies,
Pine, & Walsh, 2001; Steiger, 2004; Striegel-Moore & Bulik, 2007). Researchers have
also examined certain familial factors such as family eating behaviours, early feeding
problems, family functioning, familial psychiatric history, parental comments and
teasing about weight and shape, and parental modelling of weight concerns and
disturbed eating (Fairburn, Welch, Doll, Davies, & O'Connor, 1997; Field et al., 2008;
Fulkerson, Strauss, Neumark-Sztainer, Story, & Boutelle, 2007; Hodes & Le Grange,
1993; Kotler et al., 2001; Latzer, Hochdorf, Bachar, & Canetti, 2002; Smolak, Levine,
& Schermer, 1999; Stice, 1998; Strober, Freeman, Lampert, Diamond, & Kaye, 2000).

Other factors linked to the development and maintenance of eating disorders and
eating disorder symptoms include psychological factors such as low self-esteem, low
body esteem, depression, ineffectiveness, mood intolerance, anxiety, obsessive-
compulsive personality features, clinical perfectionism, overconcern and preoccupation
with weight and shape, and need for control (Cooley & Toray, 2001; Fairburn et al.,
1997; Field et al., 2008; R. M. Gardner, Stark, Friedman, & Jackson, 2000; Jacobi et al.,
2004). Individual factors include age, history of sexual abuse, internalisation of media
ideals, and self-objectification (Field et al., 2003; Field et al., 2008; Neumark-Sztainer,
Paxton, Hannan, Haines, & Story, 2006; Neumark-Sztainer, Story, Hannan, Beuhring,
& Resnick, 2000; Slater & Tiggemann, 2010; Stice, Cameron, Killen, Hayward,
Sociocultural factors, such as peer conversations about appearance, appearance-related teasing, societal pressure to be thin, and objectification, have also been proposed (Dohnt & Tiggemann, 2006; R. M. Gardner et al., 2000; Haines, Neumark-Sztainer, Eisenberg, & Hannan, 2006; Harrison & Hefner, 2006; Jones, Vigfusdottir, & Lee, 2004; Moradi, Dirks, & Matteson, 2005).

Of interest to this thesis was objectification theory which posits that sociocultural variables interact with individual and psychological variables to predict disordered eating. Sociocultural factors emphasise the importance of social pressures as the drive behind an individual’s need to meet cultural standards of beauty and body shape (Cusumano & Thompson, 1997). They are considered central to the development and maintenance of eating disorders (Anderson-Fye, 2009; Harper & Tiggemann, 2008; Stice & Whitenton, 2002).

2.4. Objectification Theory

In their seminal paper, Fredrickson and Roberts (1997) proposed objectification theory as a comprehensive framework for understanding how females’ experiences of living in a cultural milieu that is permeated by sexual objectification can lead to a variety of psychopathology, including eating disorders. The constructs forming objectification theory as originally proposed by Fredrickson and Roberts are depicted in Figure 1. Although objectification theory was originally applied exclusively to females, recent research has begun to focus on the applicability of objectification theory to males. As such, this literature review will focus on objectification theory as it relates to both males and females. In addition, given the primary focus of this thesis is on body image and eating disorders, this review will focus predominantly on how objectification theory pertains to the development of eating disorders. Each of the pathways outlined in Figure 1 will now be described.
2.4.1. Sexual objectification. Objectification occurs whenever an individual’s body or body parts are regarded as being capable of representing the person as a whole (Bartky, 1990; Fredrickson & Roberts, 1997). Although sexual objectification comes in several forms, including sexual violence, sexual advances, inappropriate sexual comments, and sexualised evaluation (also referred to as “gaze” or visual inspection of the body; Fredrickson & Roberts, 1997; Moradi et al., 2005), Fredrickson and Roberts (1997) noted that at the core of all forms of sexual objectification is the experience of being treated as an object that exists solely for the use and pleasure of others.

Although objectification is reinforced by a number of social and cultural influences, including parents and peers, Fredrickson and Roberts (1997) cited the powerful and central role of the mass media in broadly disseminating images that promote visual inspection of the body and that focus on unrealistic bodies or body parts. The media has long been considered one of the most important factors for the emergence of negative body image, dieting and, ultimately, eating disorders (Levine, Piran, & Stoddard, 1999). Multiple studies, including three meta-analyses, have
highlighted the deleterious role of the visual media in contributing to the development of internalisation of societal ideals of physical appearance, negative body image, negative affect, poor self-concept, drive for thinness, drive for muscularity, and eating disturbances in adults, adolescents, and children (Agliata & Tantleff-Dunn, 2004; Blond, 2008; Durkin & Paxton, 2002; Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002; Hargreaves & Tiggemann, 2003; Harrison & Cantor, 1997; Heinberg & Thompson, 1995; L. M. Irving, 1990; McCabe & Ricciardelli, 2005; Morrison, Morrison, & Hopkins, 2003; Morry & Staska, 2001; Stice, Spangler, & Agras, 2001).

Fredrickson and Roberts (1997) further argued that the pervasive proliferation of objectified images in the media has permeated the cultural milieu. They proposed that females, in particular, live in a culture in which their bodies are socially constructed as objects to be looked at and evaluated and that, given the pervasiveness of this objectification, females of all ages are vulnerable to the experiences of objectification, albeit to varying degrees. A significant body of evidence supports this argument and further suggests that the objectification of both males and females occurs widely in Western society and in the mediums of television (e.g., sports programming, music videos, music lyrics, and situation comedies; Arnett, 2002; Aubrey & Frisby, 2011; Emerson, 2002; Lampman et al., 2002; Messner, Dunbar, & Hunt, 2000; Seidman, 1992; Sommers-Flanagan, Sommers-Flanagan, & Davis, 1993; Ward, 1995; Weitzer & Kubrin, 2009), adult, teen, and children’s magazines (Durham, 1998; A. Garner, Sterk, & Adams, 1998; Krassas, Blauwkamp, & Wesselink, 2001; Reichert, Lambiase, Morgan, Carstarphen, & Zavoina, 1999; Rohlinger, 2002), advertising (Baker, 2005; Lindner, 2004; Messner et al., 2000; H. G. Pope, Olivardia, Borowiecki, & Cohane, 2001; Reichert, LaTour, Lambiase, & Adkins, 2007; Stankiewicz & Rosselli, 2008; Zimmerman & Dahlberg, 2008), video games (Beasley & Standley, 2002; Haninger & Thompson, 2004), and new technologies (e.g., Internet and social networking sites;
Although research suggests that females are more likely to be objectified than males (e.g., Andsager & Roe, 2003; Aubrey & Frisby, 2011; Burgess, Stermer, & Burgess, 2007; Plous & Neptune, 1997; Reichert et al., 1999; Sommers-Flanagan et al., 1993), the objectification of both sexes appears to be increasing over time (P. J. Johnson, McCreary, & Mills, 2007; Krassas et al., 2001; H. G. Pope et al., 2001; Reichert & Carpenter, 2004; Reichert et al., 1999).

**2.4.2. Self-objectification.** Central to objectification theory is the proposition that in the process of being viewed by others in an objectifying way, individuals are acculturated to internalise a critical observer’s perspective of their physical self, a psychological process termed *self-objectification* (Fredrickson & Roberts, 1997). Drawing on social psychological theories, Fredrickson and Roberts (1997) argued that an individual’s sense of self is a social construction, and that the way society and other people view and treat individuals will be reflected in the way they view and treat themselves. In an objectifying environment, individuals are therefore socialised to adopt a third-person view of themselves as objects whose value is dependent on their physical appearance rather than their abilities. In the process they internalise societal values of physical appearance (Morry & Staska, 2001; Pesa, Syre, & Jones, 2000). However, as individuals identify differently with the multiple, widely disseminated discourses that exist socially and culturally (Piran & Cormier, 2005), the degree to which individuals self-objectify will also vary (Fredrickson & Roberts, 1997). This explains why vulnerability to objectification may not exist in all individuals (Williams, Thomsen, & McCoy, 2003).

As described in Section 1.1, self-objectification has been conceptualised as both a state and a trait (Fredrickson & Roberts, 1997). Several correlational, longitudinal, and experimental studies have supported the significant positive relationship between various types of sexual objectification experiences and both state and trait self-
objectification in males and females (M. S. Hill & Fischer, 2008; Kozee, Tylka, Augustus-Horvath, & Denchik, 2007; Moradi et al., 2005; Morry & Staska, 2001; Rolnik, Engeln-Maddox, & Miller, 2010; Sinclair, 2006). In a longitudinal analysis of undergraduates by Aubrey (2006), exposure to sexually objectifying television content in the first wave of the study significantly predicted an increase in trait self-objectification in the second wave of the study (1 year later) in males and females. In an experimental manipulation of objectification by Harper and Tiggemann (2008), Australian female undergraduates were randomly assigned to view one of three image sets: a control set, a thin-idealised female set, or a thin-idealised female with male set (the latter featuring a thin-idealised female depicted as being the subject of attention by at least one male). Results revealed that state self-objectification, appearance anxiety, negative mood, and body dissatisfaction were significantly higher in the thin-idealised conditions than in the control condition. A significant difference between the two idealised image conditions was not found, suggesting that magazine images featuring thin female models can encourage females to consider themselves as objects without needing to explicitly include a depiction of objectification (Harper & Tiggemann, 2008).

2.4.3. Habitual body monitoring. Fredrickson and Roberts (1997) further postulated that as individuals become aware of external evaluation, they may engage in habitual body monitoring (also referred to as body surveillance). This involves constantly scrutinising and assessing their physical appearance in an effort to compare their body to an internalised standard. In the process, they become preoccupied with their physical appearance. Habitual body monitoring is further conceptualised by Fredrickson and Roberts (1997) as a strategy used by individuals who self-objectify to anticipate and control how they will be treated. If the daily interactions and the economic and social prospects of females are determined by other people’s evaluations
of their physical appearance, then it is advantageous and adaptive for them to attend to and assess their own bodies regularly and anticipate any social consequences of their appearance (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998). Whilst acknowledging that males may not experience objectification to the same degree as females, Strelan and Hargreaves (2005) argued that the recent proliferation of objectifying images of males may also foster a belief that in order to be valued, males must also attain the idealised male body that is valued by society.

2.4.4. Negative psychological consequences. The habitual body monitoring resulting from self-objectification is, in turn, postulated by Fredrickson and Roberts (1997) to result in a variety of negative psychological consequences in the form of body shame, anxiety, a reduction in peak motivational states, and reduced awareness of internal states. Although all of these consequences are now described, the stronger body of evidence for the role of body shame in the objectification theory framework means this consequence is reviewed in greater detail.

2.4.4.1. Body shame. As described, habitual body monitoring involves a process of comparison whereby individuals compare their bodies to an internalised ideal that encompasses social norms. However, in today’s Western society there is a strong preoccupation with, and cultural emphasis on, body shape and appearance. The images that females are continually exposed to in Western societies are idealised images that persistently promote, value, and glorify thinness, attractiveness, and sexiness as well as other difficult (or impossible) to achieve, and often contradictory, standards of beauty such as large breasts, youth, height, toned body shape, and Caucasian features (Buote, Wilson, Strahan, Gazzola, & Papps, 2011; Heinberg, 1996; Levine & Smolak, 2002; Murnen & Seabrook, 2012; Striegel-Moore, Silberstein, & Rodin, 1986; Thompson & Tantleff, 1992). The media is a strong proponent of these standards, insidiously promoting thinness as being not only desirable, but also the prevailing norm for females
(Harper & Tiggemann, 2008). For males, it is a mesomorphic muscular body build that is of growing importance (H. G. Pope et al., 2001; H. G. Pope, Olivardia, Gruber, & Borowiecki, 1999; Tylka, 2011), with an ideal body defined by leanness, narrow hips, and a flat stomach, yet muscular with broad shoulders and a well-developed upper body (Tiggemann, 2005b). Although there is an emphasis on muscularity in males, Jones et al. (2008) have cautioned that a singular focus on muscularity could distort the importance of this one aspect of body image, leading to an inadequate exploration and understanding of other important factors in males, such as weight concerns.

The promotion of physical attractiveness occurs in a context where complex cultural scripts equate thinness, beauty, and attractiveness with success, desirability, status, popularity, superiority, and happiness (Harrison, 2000; C. Johnson, Connors, & Tobin, 1987; Levine et al., 1999; Paxton et al., 1991; Striegel-Moore et al., 1986; Tiggemann, 2005b). This is reinforced by the negative societal attitudes and stigma directed towards overweight and obese individuals, including children (Puhl & Brownell, 2001; Puhl & Latner, 2007), where “fatness” is seen as signalling weakness and failure (Levine & Murnen, 2009).

These messages on the importance of physical attractiveness contribute to the creation of an environment where narrow ideals of attractiveness and body shape are highly valued (Tiggemann & Lynch, 2001). However, cultural expectations for the male and female body do not reflect population norms. For females, although the average woman has become heavier (Spitzer, Henderson, & Zivian, 1999), the ideal figure has become progressively thinner (D. M. Garner, Garfinkel, Schwartz, & Thompson, 1980; Katzmarzyk & Davis, 2001; Seifert, 2005; Swami et al., 2010; Sypeck, Gray, & Ahrens, 2004; Wiseman, Gray, Mosimann, & Ahrens, 1992). Although males encounter more varied body shapes when compared to the stringent body ideal that females encounter (Buote et al., 2011), many of the males depicted in media images also represent a
virtually unattainable physical ideal (Leit, Pope, & Gray, 2001; Olivardia, Pope, Borowiecki, & Cohane, 2004). Due to genetics and the physiology of weight regulation, few individuals can mould their bodies into the idealised shapes (Buote et al., 2011; Groesz et al., 2002), and the discrepancy between population norms and these ideals means both sexes will typically fail to conform to socioculturally-determined expectations of beauty and thinness (Buote et al., 2011; Katzmarzyk & Davis, 2001).

With continual comparisons to an internalised ideal through body monitoring, males and females may come to experience body shame. Correlational research supports this proposition, consistently finding a significant, strong, positive relationship between body surveillance and body shame in women (Augustus-Horvath & Tylka, 2009; McKinley, 2006), in undergraduate males and females (Calogero, 2009; Greenleaf, 2005; McKinley, 1998; Mercurio & Landry, 2008; Moradi et al., 2005), and in adolescent boys and girls (Slater & Tiggemann, 2010). This finding has also been supported prospectively in early adolescent boys and girls (Grabe, Hyde, & Lindberg, 2007).

Although it has been suggested that self-objectification can affect all individuals (Fredrickson & Roberts, 1997), it seems likely that the consequences of self-objectification will affect those with a larger body size to a greater extent. Those with a larger body size or greater adiposity are likely to perceive a greater discrepancy between their body size and the internalised ideal (Knauss, Paxton, & Alsaker, 2008). Consequently, body shame is likely to be heightened in individuals with increased body mass. Empirical research has indeed found a positive association between body mass and body shame in adults, adolescents, and preadolescents, both cross-sectionally and longitudinally (e.g., Blowers, Loxton, Grady-Flesser, Occhipinti, & Dawe, 2003; Jones et al., 2004; Knauss et al., 2008; Lawler & Nixon, 2011; McCabe & Ricciardelli, 2005;
McBabe, Ricciardelli, Waqa, Goundar, & Fotu, 2009; Sands & Wardle, 2003; Sinclair, 2006; Sinton & Birch, 2006; van den Berg, Wertheim, Thompson, & Paxton, 2002).

2.4.4.2. Anxiety, reduction in peak motivational states, and reduced awareness of internal states. Anxiety, a reduction in peak motivational states, and reduced awareness of internal states are the three additional negative psychological consequences referred to in the original proposal of objectification theory by Fredrickson and Roberts (1997). Two forms of anxiety were highlighted in this proposal: appearance anxiety and safety anxiety. According to Fredrickson and Roberts (1997), being in a culture that objectifies females creates appearance anxiety as females are never fully certain of when and how their body will be evaluated. Furthermore, in a culture that views females as merely bodies to be used and consumed by others, Fredrickson and Roberts (1997) argued that females are at greater risk of sexual violence. According to Levine and Smolak (2002), females as a group experience more threatening sexual harassment and abuse. This risk requires them to attend to and be vigilant of their physical safety, creating safety anxiety (Fredrickson & Roberts, 1997). Although both these forms of anxiety can apply to males, they have not yet been explored in this population. Indeed, the role of safety anxiety within the objectification theory framework does not appear to have been examined in any studies to date (Moradi & Huang, 2008; Szymanski, Moffitt, & Carr, 2011). Support for the role of appearance anxiety has been found, with self-objectification found to be positively related to appearance anxiety in both males and females (Calogero, 2004; T. A. Roberts & Gettman, 2004).

Peak motivational states, or flow experiences, refer to being fully absorbed in a mental or physical activity such that one’s body or mind is completely involved in an effort to accomplish something worthwhile (Csikszentmihalyi, 1990). According to Fredrickson and Roberts (1997), objectification of the body interrupts peak motivational
states by creating an environment in which individuals are made to feel self-conscious and self-objectify, and therefore cannot fully immerse themselves in physical and mental activities. This may result in reduced quality of life. In a similar vein, awareness of internal states can also be interrupted by self-objectification and body monitoring. In being hypervigilant of their physical appearance, individuals may have fewer cognitive resources to attend to their inner experiences, influencing their ability to detect and accurately interpret physiological sensations (Fredrickson & Roberts, 1997). In a review of the literature by Moradi and Huang (2008), self-objectification was found to be related to reduced internal bodily awareness, a disconnect from bodily functions, reduced peak motivational states, and difficulty in task performance in females.

2.4.5. Mental health risks. Finally, according to objectification theory, the aforementioned negative psychological consequences accumulate, resulting in psychopathology such as eating disorders, depression, and sexual dysfunction (Fredrickson & Roberts, 1997). Whilst these mental health risks can occur directly from extreme sexual objectification experiences such as sexual victimisation, it is the indirect and more insidious route shown in Figure 1 that is of interest in this thesis.

2.4.5.1. Eating disorders. Of primary interest to this thesis is how self-objectification may contribute to the development and maintenance of eating disorders and eating disorder symptomatology. When individuals recognise that their bodies are subject to external evaluation, internalise this external evaluation of the self, and compare their bodies to internalised cultural ideals, they may come to experience body shame and appearance anxiety when they fail to conform to these unattainable internalised body ideals. These experiences may put pressure on both healthy-weight and overweight individuals to become thin or maintain a thin physique, thereby motivating them to meet this internalised ideal (Fredrickson & Roberts, 1997).
Attempts to meet this internalised ideal and reduce body weight will typically involve dietary restraint and exercise. However, body weight is not as amenable to change as the mass media suggests (McKinley & Hyde, 1996), and a failure to achieve satisfactory weight loss or muscularity (or both) may result in males and females resorting to more extreme behaviours characteristic of eating disorders, such as self-induced vomiting, excessive and compulsive exercise, laxative misuse, anabolic steroid use, and food supplements (Cafri et al., 2005; Leit et al., 2001; Ricciardelli & McCabe, 2003; Ricciardelli et al., 2003). Disordered eating in the form of binge eating may also result from feelings of negative affect associated with the failure to meet cultural standards (Noll & Fredrickson, 1998) and from the restriction of caloric intake associated with dieting (Stice et al., 2002). That is, whilst body shame may be a motivating factor to conform (resulting in dieting), the negative affect associated with body shame and perceptions of failure, and the caloric deprivation associated with dieting, may also trigger binge eating.

Anticipated body shame may also play a role in the development of disordered eating (Noll & Fredrickson, 1998). Noll and Fredrickson (1998) argued that although individuals who self-objectify are preoccupied with their appearance, they may not necessarily be ashamed of their appearance. However, given the power of anticipated shame in influencing conformity to social norms (Scheff, 1988), these individuals may anticipate the experience of body shame should they fail to meet body ideals, and may therefore engage in disordered eating to maintain their current level of body satisfaction (Noll & Fredrickson, 1998). In this argument, disordered eating is both a response to body shame as a result of failing to meet cultural standards and a preventative strategy driven by the anticipation and avoidance of body shame.

Various correlational studies have indeed found self-objectification and its negative psychological consequences of body monitoring and body shame to be
significantly associated with body image disturbance (such as poor body esteem, appearance anxiety, weight dissatisfaction, and body dissatisfaction) and eating disorder symptomatology (such as binge eating, purging, dietary restraint, fear of fatness, and preoccupation with food) in community-based samples of males and females (Calogero, 2009; Greenleaf & McGreer, 2006; Kozee et al., 2007; McKinley, 1998, 2006; Noll & Fredrickson, 1998; Rolnik et al., 2010; Strelan, Mehaffey, & Tiggemann, 2003; Tiggemann & Kuring, 2004). Empirical evidence for the link between self-objectification and eating disorder symptoms has also been found in a clinical sample of females with eating disorders (Calogero et al., 2005).

Experimental studies have reported similar findings. A study by Fredrickson et al. (1998) experimentally manipulated self-objectification and examined the effects of this manipulation on body shame and disordered eating. As objectification theory predicts that self-objectification can be triggered or exacerbated in situations that intensify individuals’ awareness of an observer’s perspective of their bodies, Fredrickson et al. (1998) reasoned that self-objectification may be more salient in situations that heighten a person’s awareness of his or her body size and concern for judgement. In their sample of 82 undergraduate students (40 males, 42 females), they assigned 50% of participants to a condition where they were required to try on a one-piece swimsuit, whilst the remaining half were required to try on a crew neck sweater. Whilst wearing the items of clothing, participants were required to complete various questionnaires, including a body shame measure developed specifically for the study, the Self-Objectification Questionnaire (Noll & Fredrickson, 1998), and a math test. After changing back into their original clothes, participants completed a taste test where they were asked to eat as many Twix chocolate bars as they desired and complete the accompanying opinion questionnaire.
Fredrickson et al. (1998) found that for females, those in the swimsuit condition experienced higher levels of body shame than those in the sweater condition. For males the experimental manipulation was not significant, although trait self-objectification did predict body shame regardless of condition assignment. Females and males in the swimsuit condition reported feeling ashamed, humiliated, disgraced, guilty, and blameworthy. Although the experimental condition did not predict restrained eating, those high on trait self-objectification were more likely be in the restraint group (those who ate less than one Twix bar) than the no restraint group (those who ate one or more Twix bars), suggesting that trait self-objectification may increase risk for restrained eating. Finally, controlling for past math test performance, females in the swimsuit condition performed significantly worse than females in the sweater condition on the math test, whereas performance in males was unaffected by experimental condition. This latter result supports the proposition that self-objectification consumes mental resources and that circumstances magnifying state self-objectification could lead to diminished performance on a cognitive task. These findings have been replicated more recently by Hebl, King, and Lin (2004) and Quinn, Kallen, and Cathey (2006).

Comprehensive tests of objectification theory as it pertains to the development of eating disorders have also been conducted using path analysis or structural equation modelling techniques that have the added advantage of examining the validity of the theory overall in addition to the proposed individual pathways. Whilst several of these tests have been conducted (e.g., Moradi et al., 2005; Tylka & Hill, 2004), a study on a diverse sample of 20- to 84-year-old Australian women by Tiggemann and Lynch (2001) was conducted with the most methodological rigour. In this study, both self-objectification and body surveillance were explicitly incorporated within their model and directly assessed (a distinction lacking in other examinations). Additionally, Tiggemann and Lynch focused specifically on the consequences of self-objectification
and did not measure objectification, taking as a given the link between objectification experiences and self-objectification overwhelmingly found in previous research.

In accordance with objectification theory, Tiggemann and Lynch (2001) constructed a path diagram in which self-objectification was theorised to lead to habitual body monitoring, which was theorised to lead to body shame and appearance anxiety, which in turn were theorised to lead to disordered eating (operationalised as high drive for thinness, body dissatisfaction, and bulimia scores on the Eating Disorder Inventory created by D. M. Garner, Olmsted, & Polivy, 1983). The model of objectification theory as it pertains to eating disorders was well supported, with almost 59% of the variance in eating disorder symptoms accounted for by this model. The significant pathways found by Tiggemann and Lynch are depicted by the solid lines displayed in Figure 2. As can be seen in this figure, self-objectification was associated with body surveillance (or habitual body monitoring), which in turn was associated with body shame and appearance anxiety. Body surveillance, body shame, and appearance anxiety were, in turn, all found to be associated with disordered eating. Tiggemann and Lynch observed a stronger pathway to disordered eating via appearance anxiety than via body shame and they suggested that this important variable be included in future research on objectification theory and eating disorders.
Figure 2. Path diagram of significant pathways found in Tiggemann and Lynch’s (2001) test of objectification theory in women. The significant pathways found in their first test of objectification theory are depicted by the solid lines. The significant pathways found in their second, more comprehensive, examination of objectification theory are depicted by both the solid and broken lines.

Given that considerable research documents body dissatisfaction as a risk factor for dieting and disordered eating (Polivy & Herman, 2002; Stice, 2002; Stice, Mazotti, Krebs, & Martin, 1998; Stice et al., 2002; Stice & Shaw, 2002; Thompson, Coover, Richards, Johnson, & Cattarin, 1995), Tiggemann and Lynch (2001) also conducted a more comprehensive analysis that examined an extended model of objectification theory. This extended model integrated age, BMI, and body dissatisfaction into the objectification theory framework. This model accounted for 67% of the variance in eating disorder symptoms. In addition to the significant pathways depicted by the solid lines in Figure 2, a significant negative pathway was found between age and self-objectification. Additionally, significant positive pathways were found between body
surveillance and body dissatisfaction; between body dissatisfaction and disordered eating; and between BMI and appearance anxiety, body shame, and body dissatisfaction. The results obtained with the inclusion of body dissatisfaction in the model suggest that body dissatisfaction is an important variable that should be incorporated in models of objectification theory.

These findings have been replicated more recently in another comprehensive test of objectification theory conducted by Tiggemann and Williams (2012). This study of Australian female undergraduates did not just apply objectification theory to eating disorders, but rather tested the entire model of objectification theory depicted in Figure 1. The model was very successful in predicting disordered eating, accounting for 93% of the variance in this variable. Self-objectification was positively associated with body surveillance, body surveillance was positively associated with body shame and appearance anxiety, and body shame and appearance anxiety were positively associated with disordered eating. In support of earlier findings, the path from appearance anxiety to disordered eating was stronger than the path from body shame to disordered eating. In contrast to previous findings, however, a direct path from body surveillance to disordered eating was not indicated and a significant path from body shame to appearance anxiety was found.

A significant advantage of this overall test of objectification theory was that the other two proposed mediators (reduction in peak motivational states and reduced awareness of internal states) were also tested. Reduction in peak motivational states was not associated with either eating disorders or depressed mood, and reduced awareness of internal states was associated with depressed mood only, suggesting that these mediators do not have a unique effect on disordered eating. These results mirror the findings of a literature review by Szymanski et al. (2011), in which they concluded that whilst consistent support has been found for the mediating role of body shame and
appearance anxiety in the link between self-objectification and disordered eating, mixed or limited support has been found for the mediating role of awareness of internal states and no support has been found for the mediating role of flow experiences.

Finally, comprehensive tests of objectification theory as it pertains to eating disorder symptoms in adolescent girls have also been conducted. In one such study of 83 Australian adolescent girls by Slater and Tiggemann (2002), the entire model of objectification theory received substantial support: self-objectification was associated with body surveillance as well as body shame and appearance anxiety; body surveillance was associated with body shame; and body shame was associated with disordered eating. In contrast to the results of Tiggemann and Lynch (2001) and Tiggemann and Williams (2012), the pathway from appearance anxiety to disordered eating failed to reach significance. Of particular interest in this study, however, was the finding that self-objectification and its consequences were already evident in girls as young as 12 years of age.

**2.4.5.1.1. Gender differences.** Females receive more messages to be slim and stay in shape than do males, either indirectly, by viewing images of thin women, or directly, through verbal evaluation and gaze (Tylka & Hill, 2004). In a study by Buote et al. (2011), the appearance norms encountered by females in daily life were found to be more rigid, homogenous, and pervasive than those for males. Buote et al. (2011) therefore argued that although appearance ideals exist for both genders, these ideals are not equivalent in prevalence or impact: females are bombarded with media images that frequently present a fairly rigid standard of appearance and a single body ideal. By contrast, males are exposed to fewer (and less frequent) depictions of idealised male media images, and images of males overall present a more heterogeneous, flexible, and attainable set of ideals. It has been suggested that females are more sensitive to these messages regarding the ideal because they are more likely than males to be socialised to
adopt the traditionally feminine behaviour of pursuing physical attractiveness (Striegel-Moore & Smolak, 2002) and because beauty is a central component of the female gender role stereotype (Striegel-Moore & Franko, 2002).

Gender differences in the various constructs that form objectification theory are frequently found, with females reporting higher levels of self-objectification, body surveillance, body shame, body esteem, appearance anxiety, weight and body dissatisfaction, and disordered eating, as well as stronger relationships between these variables (Aubrey, 2006; Calogero, 2009; Choma et al., 2010; Grabe et al., 2007; Knauss et al., 2008; McKinley, 1998; Presnell, Bearman, & Stice, 2004; Slater & Tiggemann, 2010; Tiggemann & Kuring, 2004). In an examination of objectification theory as it pertains to eating disorders in undergraduates by Choma et al. (2010), however, gender did not moderate the relationship between the various constructs. That is, although levels of self-objectification and its associated negative psychological experiences were more severe among females compared to males, the pattern of relationships among the constructs of body surveillance, body shame, and appearance anxiety was similar. Slater and Tiggemann (2010) reported similar findings in their examination of objectification theory in adolescents. Despite observed gender differences in levels of body surveillance, body shame, appearance anxiety, and disordered eating, the proposed model of objectification theory was supported in both adolescent girls and boys, suggesting that the mediational tenets of objectification theory may be applicable to both genders. This supports research on appearance ideals that has found that although sociocultural influences and body image disturbance differ in intensity between the genders, the nature of sociocultural influences affecting body shape and size change strategies are similar across genders (Lawler & Nixon, 2011; Ricciardelli et al., 2000).
2.4.5.2. Depression. Although the primary interest of this thesis is objectification theory as it pertains to eating disorders, the applicability of the theory to depression and sexual dysfunction warrants brief review. According to objectification theory, depression may result from a consistent failure to achieve the unattainable ideal body, and from a sense of helplessness that individuals may feel when they cannot conform to the ideal nor control the evaluation of their physical appearance (Fredrickson & Roberts, 1997). As described above, the ideal body presented in today’s Western visual media is virtually impossible to achieve. People of all ages are bombarded with unrealistic, unobtainable, and highly stylised images of males and females and are led to believe that the body is infinitely malleable (Adams, Katz, Beauchamp, Cohen, & Zavis, 1993; Striegel-Moore & Franko, 2002). As described in Section 2.4.5.1, however, body weight is not as amenable to change as the media suggests (McKinley & Hyde, 1996). Feelings of ineffectiveness and failure may therefore be prompted by a repeated inability to achieve or sustain weight loss (F. Johnson & Wardle, 2005; Neumark-Sztainer et al., 2006). Additionally, as described in Section 2.4.4.2, a reduction in peak motivational states can reduce opportunities for pleasure, resulting in reduced quality of life. Combined with experiences of body shame, appearance anxiety, and learned helplessness, depression may be a resulting pathology (Fredrickson & Roberts, 1997).

Comparatively little research has been conducted examining objectification theory as it pertains to the development of depression. Of the studies that have been conducted (e.g., Grabe et al., 2007; Harrison & Fredrickson, 2003; Muehlenkamp, Swanson, & Brausch, 2005; Szymanski & Henning, 2007; Tiggemann & Kuring, 2004; Tiggemann & Williams, 2012), support for the role of self-objectification and body surveillance in the development of depression has been found. In one study of female undergraduates by Muehlenkamp et al. (2005), the relationship between self-
objectification and depression was mediated by negative body regard, suggesting that self-objectification is significantly associated with depression, but only to the extent to which self-objectification results in body shame and negative attitudes to the body. This finding reflects the results of other studies of male and female undergraduates by Tiggemann and Kuring (2004) and Tiggemann and Williams (2012). In these comprehensive tests of objectification theory, the relationship between self-objectification and depression was mediated by body surveillance, body shame, and appearance anxiety, supporting the propositions made by objectification theory.

2.4.5.3. Sexual dysfunction. According to Fredrickson and Roberts (1997), the self-objectification, body monitoring, body shame, appearance anxiety, and reduced awareness of internal states that may result from a culture of objectification, consume mental resources that might otherwise be used on a more satisfying and rewarding activity. One activity they highlighted specifically was sexual intercourse. They argued that attentiveness to physical appearance reduces attentiveness towards internal body signals of arousal resulting in sexual dysfunction and a reduction of sexual satisfaction.

The applicability of objectification theory to sexual dysfunction has recently been examined in females by Tiggemann and Williams (2012), A. Steer and Tiggemann (2008) and Calogero and Thompson (2009). In all studies, the propositions made by objectification theory in relation to sexual dysfunction received some support, with body shame and appearance anxiety mediating the relationship between body surveillance and sexual dysfunction. In the Tiggemann and Williams (2012) study, however, the model of objectification theory was considerably less successful in predicting sexual functioning than it was in predicting disordered eating and depressed mood. Additionally, in the A. Steer and Tiggemann (2008) study, women’s satisfaction with their relationship was a stronger cross-sectional predictor of sexual functioning than the constructs posited by objectification theory. Finally, in the Calogero and
Thompson (2009) study, only 30% of the variance in sexual satisfaction was accounted for by body shame, sexual self-esteem, self-surveillance, and media internalisation.

2.4.6. Summary. Objectification theory is a comprehensive framework that emphasises objectification as a social construction that encourages specific attitudes, cognitions, and behaviours that may lead to the development of eating disorders. A core tenet of this theory is that learned cultural practices of objectification routinely encountered in Western society socialise individuals to self-objectify. In doing so they internalise an outside observer’s perspective of their physical selves and they learn to view their own bodies as an object that must be constantly monitored and scrutinised to ensure it conforms to internalised cultural standards, fostering an unhealthy preoccupation with physical attractiveness. This habitual body monitoring can result in a host of deleterious psychological experiences as individuals strive, and typically fail, to reach unrealistic and virtually unattainable cultural standards of beauty and thinness (Noll & Fredrickson, 1998). These psychological experiences are emotional, motivational, and attentional in nature, and include body shame, anxiety, reduced peak motivational states, and reduced awareness of internal states. These adverse psychological experiences may serve as antecedents to psychological disorders such as eating disorders, depression, and sexual dysfunction.

2.5. Objectification Theory and Children

Whilst objectification theory as it applies to eating disorders has been investigated extensively in undergraduates and other adults, there has been very little empirical research that has explored objectification theory as it pertains to disordered eating in children. This is despite the fact that although eating disorders typically manifest during adolescence and young adulthood, the critical antecedent conditions, putative risk factors, and psychological processes that lead to the development of poor body image and eating disorder symptoms may be established or acquired in childhood.
(Dohnt & Tiggemann, 2006; R. M. Gardner et al., 2000; Kostanski & Gullone, 1998; Sands & Wardle, 2003; Schur et al., 2000).

Anecdotal evidence suggests that objectifying images of children are being increasingly used in the mass media (Carmody, 2010, March 21; Farr, 2011, May 6; Hunter, 2009, November 11; M. Irving, 2008, August 2; McKimmie, 2012; McPhee, 2010, March 18). However, to date, little research has been conducted on the nature of objectification in media sources targeting children directly. Several reviews have, however, reported on child exposure to objectification in the form of children’s clothing, dolls, and action figures (American Psychological Association Task Force on the Sexualization of Girls, 2007; Goodin, Van Denburg, Murnen, & Smolak, 2011). According to Goodin et al. (2011), clothing has become closely tied to attractiveness and popularity. Girls in particular are led to believe that clothes are important to being noticed and fitting in (Lamb & Brown, 2006). It has also been suggested that in young girls who have yet to develop a stable identity, clothing may provide an opportunity to experiment with their newly forming identities by trying on various social masks and fulfilling various roles (Strasburger & Wilson, 2002). Clothing choice is therefore likely to be important to young girls (Graff, Murnen, & Smolak, 2012). However, given the finding of a recent content analysis that nearly 30% of the young girls’ clothing items examined had objectifying characteristics (Goodin et al., 2011), objectified clothing made available to children may promote an objectified ideal and influence body image.

Similarly, developmental psychologists and anthropologists have recognised the vital importance of play in child development for many years (e.g., Huizinga, 1949; Sutton-Smith, 1986). Play has acquired an important socialising role (Sutton-Smith, 1986), and interaction with toys is a particularly salient way in which children engage with their sociocultural environment. Play conveys and reinforces powerful cultural messages that help children organise their world and internalise the norms, social
standards, and values within it (Singer, 1995; Sutton-Smith, 1986). It has therefore been suggested that toys that unrealistically represent the body (such as Barbie dolls, Bratz dolls, and action figures) may be internalised by children as part of their developing body image and identity, influencing the way they relate to their bodies and promoting an objectified and unrealistic body ideal (Dittmar, Halliwell, & Ive, 2006; Kuther & McDonald, 2004; Norton, Olds, Olive, & Dank, 1996; H. G. Pope et al., 1999).

It is also important to recognise that children are not only subject to the influence of images aimed specifically at them, but to images seen in wider society. Children are avid consumers of the media (D. F. Roberts, Foehr, & Rideout, 2005) and have increased access to the Internet, mobile phones, television, and other media sources. They are also spending large amounts of time engaging with media aimed at other (and older) age demographics (Department of Children Schools and Families, 2009; Harrison & Hefner, 2006; Social Issues Research Centre, 2008). Given the accessibility and the proliferation of objectifying images, it is likely that children will be exposed to content that is intended for adults and may not be age appropriate. However, as with adults, the mass media has an overwhelming influence on the lives of children and is becoming an increasingly important and powerful agent of socialisation, creating and reinforcing cultural values and providing pervasive modelling of gender roles and conduct (J. D. Brown, Halpern, & L’Engle, 2005; Bussey & Bandura, 1999). Media depictions of objectification in wider society may therefore result in children, particularly those from westernised societies where objectification is heavily promoted, seeing objectification as both normative and ideal (Smolak & Murnen, 2011). This is likely to encourage them to adopt objectified appearances and behaviours.

Social learning mechanisms can help explain the way children are influenced by depictions of objectification. The understanding of gender and appropriate femininity and masculinity is not innate, but acquired through developmental processes whereby
girls and boys draw information from the adults and peers, real and fictional, around them (Bussey & Bandura, 1999). As such, the various social learning theories, specifically cognitive developmental theory (Kohlberg, 1966), gender schema theory (Bem, 1981), and social cognitive theory (Bussey & Bandura, 1999), emphasise the importance of a child’s environment in his or her acquisition of information related to his or her gender. According to Kohlberg (1966), at approximately ages 6 to 7 years, children begin to develop gender constancy; they consider themselves either male or female, and they believe that their gender is stable and irreversible. Once gender constancy is achieved, children begin organising their world on the basis of their gender and seek to behave in ways that are congruent with their gender (Bussey & Bandura, 1999). This involves selecting same-sex models to imitate (and model). Modelling is one of the most pervasive and powerful means of conveying gender-based information. Through modelling, children learn the prototypic behaviours associated with each of the sexes, encoding and organising this information into a global representation of what is considered typical for their gender. As children interact with their environment and learn society’s expectations regarding gender, their gender schema develops to include information and knowledge about gender scripts, activities, interests, and social attributes (Bussey & Bandura, 1999).

With this information acquired, children appraise their own behaviours and personal attributes against the prototypes of their gender. Guided by an internal motivation to conform to the gender role requirements of their culture, children become intrinsically motivated to behave in ways viewed as appropriate and socially desirable for their sex (Bem, 1981). As being consistent with expectations is rewarding and the eagerness to adopt certain behaviours is influenced by the value society places on them, the depiction of objectification as a trait that increases popularity may result in young children assimilating and imitating the objectifying ways models are represented.
Specifically, if children are exposed to environments where objectified individuals are valued and come to represent their gender whilst negative attitudes are displayed towards those individuals who do not conform to societal expectations (such as overweight or obese individuals), this may communicate to children an expectation that they should emulate the appearances and behaviours that are typified by the objectified adults represented in the media. Indeed, according to Graff et al. (2012), exposure to objectifying messages may lead to the development of a cognitive schema that biases children towards the rewards associated with appearing sexy. Once these objectifying messages are internalised, a shift from external direction and modelling to self-endorsements governed by one’s personal standards takes place (Bussey & Bandura, 1999). In other words, self-objectification may occur, placing children at risk for the psychological consequences highlighted by objectification theory.

The proposition that children may be more vulnerable to the objectifying messages conveyed by society during this developmental stage is further supported by the suggestion that, compared to adults, children are intrinsically less critical and more passive consumers of the media (Social Issues Research Centre, 2008). Recent research suggests that children lack the cognitive skills, knowledge, and abilities of adults to comprehend the nature and purpose of commercial messages (Kunkel et al., 2004). They tend to see magazines as informative and helpful (Mallalieu, Palan, & Laczniak, 2005) and are unaware that digital enhancement and manipulation frequently occurs to portray the ideal female and male body (Morris & Katzman, 2003). As such, they are limited in their ability to scrutinise what they see and lack the ability to assimilate information from advertisers and the media in a critical way.

Despite the potential for children to be influenced by objectification, only two empirical studies investigating objectification theory in children appear to have been published. In a study by Lindberg et al. (2006), several of the assumptions of
objectification theory were examined in 10- to 12-year-old boys and girls. In both boys and girls, appearance-related teasing and peer sexual harassment (both forms of objectifying experiences) were strongly associated with body surveillance and body shame. Additionally, body shame was positively associated with current and past dieting behaviour in girls, and past dieting behaviour in boys. Results also revealed that gender differences in body surveillance had already emerged by age 10, with girls reporting significantly more body surveillance than boys. There were no gender differences in body shame, with the authors suggesting that perhaps gender differences in body shame had not yet emerged.

This study was limited, however, in that the data were correlational in nature. As such, a direct test of causal hypotheses could not be conducted and questions about the timing and underlying nature of body surveillance and body shame development could not be answered. In a prospective study by Grabe et al. (2007) on 11- to 13-year-old boys and girls, results indicated that self-objectification and its consequences were already evident in girls as young as 11 years of age, with girls reporting significantly more body surveillance and body shame than boys. The nature of the relationship between body surveillance and body shame was similar between the sexes, however, with body surveillance prospectively predicting body shame in both boys and girls. Although the longitudinal nature of the study provided greater confidence in the directional hypotheses, this study and the Lindberg et al. (2006) study did not explicitly examine self-objectification. Rather, its manifest (body surveillance) was used as a measure of self-objectification. Objectification theory clearly posits that self-objectification and body surveillance are distinct constructs. As such, prospective studies that explicitly assess the role of both these constructs are needed to help elucidate the processes involved in the development of body image disturbance and eating disorder symptomatology, particularly in younger age groups.
2.5.1. Summary. Children are embedded in a sociocultural environment that places undue emphasis on physical appearance (Dohnt & Tiggemann, 2006). From early childhood, children are exposed to messages about physical appearance (Jung & Peterson, 2007; Myers & Crowther, 2007). These messages teach them that appearance and beauty are especially important, and that weight is critical to body image, body esteem, self-concept, and self-esteem (Mendelson & White, 1982; Striegel-Moore et al., 1986). Through social learning mechanisms, the mass media has the power to influence how children perceive themselves, with the ideal body image held by children constructed from social and cultural factors (Jung & Peterson, 2007). However, children may not be cognitively equipped to understand and process the images and messages to which they are exposed (Borzekowski & Robinson, 1999; Kunkel et al., 2004). Additionally, it has been suggested that as physical appearance is one of the most concrete means by which one can describe themselves and others, body image may be one of the first characteristics children perceive as part of their developing self-concept (Wood, Becker, & Thompson, 1996). The importance of body image to self-concept, combined with their level of cognitive development, may make children particularly vulnerable to, and more easily accepting of, the messages conveyed by society during this developmental period (Borzekowski & Robinson, 1999). It is therefore possible that children at early developmental stages are being negatively influenced by the proliferation of objectifying images. These images have the potential to shape children’s preferences for an objectified ideal, which may influence perceptions of body shape and size and increase risk for body image disturbance and eating disorder symptoms.

These body image concerns during childhood can have important implications for current levels of psychological functioning and also for the development of body image disturbance and disordered eating in later life (Clark & Tiggemann, 2008). Although children may only experience subthreshold levels of body image disturbance,
these disturbances are psychologically maladaptive at any level. In addition, longitudinal studies of adults and children have identified body image disturbance as a strong and significant risk factor in the pathogenesis of more severe eating disorder symptoms and in the subsequent onset of full-syndrome eating disorders (Davison et al., 2003; Field et al., 2003; Jacobi et al., 2004; Killen et al., 1994; Neumark-Sztainer et al., 2006; Polivy & Herman, 2002; Ricciardelli & McCabe, 2001a; Stice et al., 2002; Wertheim, Koerner, & Paxton, 2001). Longitudinal analyses have also implicated body dissatisfaction in the development of mental distress in the form of low self-esteem, depressive symptoms, and anxiety (Holsen, Kraft, & Røysamb, 2001; F. Johnson & Wardle, 2005; Stice & Bearman, 2001). An empirical examination of objectification theory in relation to body image disturbance and disordered eating in children is therefore crucial in determining the attitudes and beliefs that may contribute to future body image concerns and maladaptive weight-loss behaviours.

2.6. Gaps in the Literature

There is considerable empirical support for the validity of objectification theory as it applies to eating disorders in adults, undergraduates, and older adolescents. However, several gaps exist in the current literature.

First, there is a lack of empirical data in relation to the role of self-objectification in the development of eating disorders in children. Although there has been a great deal of public discourse regarding the objectification of children, this debate tends to be sensationalised and highly moralistic in nature. As such, there is a need to continue building upon the small body of empirical research that explores the relationship between self-objectification, body surveillance, body shame, appearance anxiety, body dissatisfaction, and disordered eating among boys and girls. By extending or adapting the objectification theory framework to younger samples, it may be possible to identify the applicability of the theory in children and to clearly identify the various pathways
leading to body image disturbance and disordered eating in this population. This is an aim of this thesis.

Second, much of the empirical research to date has focused predominantly on females to the exclusion of males. As such, important questions regarding the consequences of self-objectification in boys remain unanswered. This area merits further investigation and debate as an examination of the role of self-objectification in the development of eating disorder symptomatology in boys is an important step in understanding the aetiology of eating disorders in males.

Third, the majority of studies have only examined the relationships among the set of variables specifically posited by objectification theory. However, not all individuals who experience self-objectification and its negative psychological consequences report increased eating disorder symptomatology. Other variables, such as self-esteem, may act as moderators of the relationship between self-objectification, body image disturbance, and disordered eating. As such, an exploration of potential moderating variables, particularly those that may act as protective factors within the objectification theory framework, should be conducted. This research is critical to informing future prevention and treatment programs that not only modify the critical risk factors, but also intervene in the specific mechanisms by which these risk factors lead to a given disorder.

Finally, objectification theory as it applies to eating disorders has not been examined extensively within the context of large-scale prospective designs. It is important that studies focus not only on verifying the predictive validity of the individual factors proposed by objectification theory, but also apply sophisticated multivariate longitudinal designs that address the underlying causal mechanisms among these factors and potential moderator variables. A prospective design would allow for greater confidence in the directional hypotheses proposed by objectification theory.
Additionally, a prospective design would allow for a greater understanding of the development of body surveillance, body shame, appearance anxiety, body dissatisfaction, and eating disorder symptomatology over time, and is essential in determining whether self-objectification is a causal risk factor of eating disturbances. Conceptualisations such as these may then allow for an improved understanding of the developmental and underlying psychological processes of eating disorders, enhancing efforts to prevent and ameliorate these conditions.

2.7. Aims of This Thesis

The primary aim of this thesis was to prospectively investigate the hypothesised contribution and etiological significance of self-objectification in the development of body image disturbance and eating disorder symptoms in children. There were three specific research aims. The first was to examine objectification theory in boys and girls and determine whether it follows the same mediational models observed in older populations. Specifically, this thesis aimed to test the models of objectification theory displayed in Figure 2 using structural equation modelling techniques to examine whether the negative psychological consequences of body surveillance, body shame, appearance anxiety, and body dissatisfaction mediate the relationship between self-objectification and disordered eating in children. By examining both self-objectification and body surveillance (rather than equating self-objectification with body surveillance) in a multiple-wave, prospective study, a more comprehensive test of objectification theory in boys and girls was provided.

Given the importance of exploring possible protective factors that may serve to decrease the associations between the pathways posited by objectification theory and, ultimately, decrease the incidence of dietary restraint and depressed mood, the second aim of this thesis was to examine whether self-esteem acts as a protective factor within the objectification theory framework. The third research aim was to quantitatively and
qualitatively explore how young girls process objectifying images. Specifically, the assimilation of objectification and the meaning girls may subconsciously attach to objectifying content was explored.

The following chapter begins the empirical research conducted for this thesis. It describes the process by which measures were validated for use in the main studies forming this thesis.
Chapter 3. Study 1: A Psychometric Evaluation of Measures of Self-Objectification and Objectified Body Consciousness in Young Children

3.1. Overview

As described in Chapter 2 (Section 2.4.5.1), objectification theory suggests that self-objectification and its negative psychological consequences of body surveillance, body shame, and appearance anxiety may be factors that contribute to the development and persistence of eating disorder symptoms in adults and adolescents. The role of these constructs in the development of eating disorder symptoms in young children, however, has not been extensively examined. This is likely due to the paucity of comprehensive and psychometrically sound measures of self-objectification, body surveillance, and body shame available for use in young children. The present study therefore sought to modify currently available measures of self-objectification and objectified body consciousness in adults and adolescents for use with a child sample, and psychometrically evaluate the utility of these modified measures in children so that research applying objectification theory to children could be conducted.

3.2. Introduction

Objectification theory posits that cultural practices of objectification socialise individuals to view themselves as objects whose value is dependent on their physical appearance (Fredrickson & Roberts, 1997). As described in detail in Chapter 2, this process of self-objectification is argued to result in several negative psychological consequences such as habitual body monitoring and body shame (termed objectified body consciousness by McKinley & Hyde, 1996), body dissatisfaction, and appearance anxiety (Tiggemann & Lynch, 2001). These psychological consequences are thought to serve as antecedents to eating disorders and depression.

Whilst the role of self-objectification in the development of eating disorder symptoms has been investigated extensively in adults, and less extensively in
adolescents, little research has been conducted in children. However, as described in
Chapter 2 (Section 2.5), children living in Western societies are embedded in an
environment that promotes objectification and places undue emphasis on appearance
(Dohnt & Tiggemann, 2006). Given the propositions made by various social learning
theories (see Section 2.5), it follows that children may also be influenced by the
objectifying images that are a part of Western society’s cultural milieu. It is therefore
important to examine the etiological significance of self-objectification in the
development of eating disorder symptoms in children. To do so, however, it is first
necessary to develop an appropriate measure of self-objectification in children.

Validated self-objectification scales for use with children are lacking and the
development of these measures is an important precursor to future work in this area.

At present, there are two measures of self-objectification and objectified body
consciousness widely used in objectification theory research: the Objectified Body
Consciousness Scale (OBCS) and the Self-Objectification Questionnaire (SOQ). The
OBCS (McKinley & Hyde, 1996) is a 24-item measure designed to assess the three
aspects of objectified body consciousness: body surveillance, body shame, and
appearance control beliefs. Given the vocabulary level and complex sentence structure
of this measure, Lindberg et al. (2006) developed an age-appropriate measure of
objectified body consciousness for adolescents. The Objectified Body Consciousness
Scale for Youth (OBC-Y; Lindberg et al., 2006) is a 14-item measure designed to assess
the degree to which adolescent youth view themselves as objects to be looked at and
evaluated by others. Like the OBCS, the youth version consists of three subscales: Body
Surveillance, Body Shame, and Control Beliefs. The Body Surveillance subscale
examines the extent to which individuals scrutinise their appearance from an outside
observer perspective (e.g., I often worry about how I look to other people). The Body
Shame subscale examines how ashamed individuals are of their bodies when it does not
conform to cultural standards (e.g., *When I’m not the size I think I should be, I feel ashamed*). The Control Beliefs subscale examines how responsible individuals feel for how their bodies look (e.g., *I think I could look as good as I wanted to if I worked at it*).

In a pilot study of the OBC-Y in a community-based sample of US 10- to 12-year-olds by Lindberg et al. (2006), adequate internal consistency of scores on the Body Surveillance and Body Shame subscales was observed (α = .88 and .79 respectively). However, adequate reliability was not obtained for scores on the Control Beliefs subscale (α = .44). A confirmatory factor analysis (CFA) conducted in the same study found that a two-factor model of the OBC-Y (with Body Shame and Body Surveillance as the two factors) provided a significantly better fit to the data than a three-factor model (with Control Beliefs as the third factor). As such, Lindberg et al. recommended using only the Body Surveillance and Body Shame subscales in preadolescents. A significant intercorrelation was observed between the Body Surveillance and Body Shame subscales, supporting research on the OBCS by McKinley and Hyde (1996) and providing initial support for the validity of the youth version of this scale.

In the same sample of 10- to 12-year-olds, Lindberg et al. (2006) examined variables theorised to be related to body surveillance and body shame, in particular gender and body mass index (BMI). Some gender differences were evident, with girls reporting significantly more body surveillance, \( r(289) = 4.10, p < .01 \), but not body shame, than boys. Consistent with previous research (e.g., Knauss et al., 2008; Tiggemann & Lynch, 2001), a significant relationship between BMI and body surveillance was not observed. The relationship between BMI and body shame also failed to reach significance in Lindberg et al.’s study. This finding stands in contrast to previous research in adults that has consistently found a significant positive relationship between BMI and body shame (e.g., Calogero, 2004; Sinclair, 2006; Tiggemann & Lynch, 2001).
The SOQ (Noll & Fredrickson, 1998) assesses the extent to which individuals view their bodies in observable, appearance-based terms as opposed to nonobservable, competence-based terms. Participants are asked to rank a list of 10 body attributes from 0 (least important) to 9 (most important) according to how important these attributes are to their own physical self-concept. Five of the body attributes are appearance-based (physical attractiveness, weight, sex appeal, measurements, muscle tone) and five are competence-based (strength, physical coordination, health, physical fitness, energy level). An assumption is made that individuals who place greater emphasis on the appearance-based attributes have a more self-objectified view of their bodies.

Given the ipsative, ordinal nature of rank-ordered data, the internal reliability of scores on the SOQ cannot be calculated. However, as self-objectification and objectified body consciousness are related constructs, measures assessing these constructs are expected to be positively related and studies have used this relationship as an indication of the validity and reliability of SOQ scores. For example, in a community-based sample of two hundred 12- to 61-year-old US females, T. A. Roberts (2004) observed significant and positive correlations between the two subscales of the OBC and the SOQ ($r = .27, p < .001$ for Body Shame; $r = .56, p < .001$ for Body Surveillance), and concluded that this provided support for the validity of SOQ scores. The large correlation observed between the Body Surveillance subscale and the SOQ is consistent with objectification theory, which states that self-objectification manifests behaviourally as body surveillance (Fredrickson & Roberts, 1997) and is therefore proximal to body surveillance.

Few studies have examined gender and BMI differences on the SOQ, and these have been conducted in young adults only. With respect to gender differences, it has been fairly consistently reported that females report significantly higher levels of self-objectification than males (Aubrey, 2006; Calogero, 2009; Tiggemann & Kuring, 2004).
With respect to BMI, research conducted to date has consistently found SOQ scores to be uncorrelated with BMI in undergraduates and other adult samples (Calogero et al., 2005; Fredrickson et al., 1998; Myers & Crowther, 2007; Tiggemann & Lynch, 2001).

### 3.2.1. Present study

Given the possibility that children may be particularly vulnerable to, and accepting of, the objectifying messages conveyed by Western society, an examination of objectification theory in this population is important. However, this research requires that child-appropriate measures of self-objectification be developed. Accordingly, the present study aimed to modify and pilot the OBC-Y and SOQ in an Australian sample of 6- to 11-year-old children, and psychometrically evaluate the utility of these modified measures in both boys and girls. Specifically, this study sought to: (a) confirm the factor structure of the modified OBC-Y; (b) examine estimations of internal reliability and convergent validity for scores obtained from modified versions of the OBC-Y and SOQ; and (c) examine the relationship between these two measures and gender and BMI \( z \)-score. The present study also sought to examine the relationship between age and the OBC-Y and SOQ constructs given that few investigations of this relationship have been conducted. A recent review by Hyde, Mezulis, and Abramson (2008), however, posited that the social and biological aspects of the transition into adolescence places girls at an increased risk for self-objectification. It has also been suggested that as they approach adolescence, children (and girls in particular) are presented with a number of challenges that increase the likelihood of engaging in self-objectification and experiencing its negative psychological consequences (Impett, Henson, Breines, Schooler, & Tolman, 2011). It was hypothesised that:

1. The two-factor structure of Body Surveillance and Body Shame observed by Lindberg et al. (2006) for the OBC-Y would be replicated.

2. Girls would experience higher levels of body surveillance, but not body shame, than boys.
3. BMI z-score would be positively related to body shame, but not body surveillance and self-objectification.

4. Older children approaching adolescence would experience higher levels of self-objectification, body shame, and body surveillance than younger children.

3.3. Method

3.3.1. Design. This community-based study involved cross-sectional data collected from five primary schools in Perth, Western Australia. Data collection occurred between November 2009 and November 2010.

3.3.2. Participants and recruitment procedures. Following ethical approval from the University of Western Australia’s Human Research Ethics Committee and the ethics committees for private and state schools in Western Australia (Catholic Education Office and Department of Education and Training respectively), 218 children (108 boys, 110 girls) were recruited from five randomly selected metropolitan primary schools in Perth, Western Australia. The schools, three private and two state, were drawn from a broad geographical area (three schools located north of Perth and two schools located south of Perth) and represented a range of socioeconomic status categories (one school drawing on a lower socioeconomic status area, two schools drawing on middle socioeconomic status areas, and two schools drawing higher socioeconomic status areas). Socioeconomic status was estimated using the Australian Bureau of Statistics' (2008) Socioeconomic Indexes for Areas 2006 rankings for the suburb where each school was located. After written approval from school principals was granted, a comprehensive letter of introduction describing the purpose and procedures of the study was sent to the parents of all children in Grades 1 to 5 (aged 6 to 11 years), inviting their children into the study and requesting parental approval. Assent forms for children were attached to this invitation.
Children who received parental consent and provided assent forms were recruited into the study. The consent rate from this process was approximately 14%, with response rates across the primary schools ranging from 9% to 19%. Information on those who did not provide active consent was not obtained. An additional 10 children had consented to participate but were absent on the scheduled assessment days. Participants ranged in age from 6 to 11 years, with a mean age of 8.68 years ($SD = 1.53$). Participants were in Grades 1 ($n = 59; 27\%$), 2 ($n = 44; 20\%$), 3 ($n = 38; 18\%$), 4 ($n = 33; 15\%$), and 5 ($n = 44; 20\%$). Mean BMI $z$-score was 0.33 ($SD = 0.84$) overall, 0.44 ($SD = 0.89$) for girls, and 0.23 ($SD = 0.77$) for boys.

3.3.3. Measures. Given the greater distractibility of children and the difficulties they may have understanding some of the questions, the assessment of body image in children poses more difficulties than it does in adults (Ricciardelli & McCabe, 2001a). Issues of suggestibility and the use of leading questions have been highlighted as particularly important factors to be considered when assessing body image in this population (Huon, Godden, & Brown, 1997). As such, measures for the present study were modified (described in detail below) to ensure response options were made as simple as possible. Careful consideration was also paid to the wording of the measures to avoid making suggestions to participants.

3.3.3.1. Weight and height. Participants were weighed (to the nearest 0.01kg) and measured (to the nearest millimetre) with a regularly calibrated set of Tanita Digital Medical Scales and a regularly calibrated portable Harpenden stadiometer. Participants were measured in light clothing and without shoes, and with their bodies positioned so that their heels and buttocks were against the vertical support of the stadiometer and their heads aligned so that the auditory canal and the lower rim of the orbit of the eye socket were in a horizontal plane.
BMI, a valid reflection of adiposity (Garrow & Webster, 1985), was calculated from height and weight using the formula:

\[
\text{BMI} = \frac{\text{Weight (in kilograms)}}{\text{Height (in metres)}^2}
\]

As the proportion of fat and lean body mass varies during childhood growth and development, BMI must be interpreted according to appropriate age- and gender-specific reference data (Rolland, Farnill, & Griffiths, 1996). As such, age- and gender-specific BMI z-scores were calculated using the Center for Disease Control 2000 reference data (Ogden et al., 2002).

### 3.3.3.2. OBC-Y

The OBC-Y, as described in the introduction, was modified for the purposes of this study to make the measure more appropriate for a child sample. Given that reliable results have not been obtained for the Control Beliefs subscale in preadolescents (Lindberg et al., 2006), the modified version of the OBC-Y given to participants in the present study consisted of only two subscales: Body Surveillance and Body Shame. In addition, as children are unable to meaningfully distinguish between response scales with several options and tend to forget large sets of response options (Scott, 2008), participants indicated their agreement to each of the items by responding on a 4-point scale of 2 (yes), 1 (sometimes), 0 (no), or not sure (rated as missing) rather than using the complex 7-point rating scale of 1 (strongly disagree) to 7 (strongly agree). This modification was made to simplify the measure for younger children and those with limited vocabularies, thereby making responses less prone to measurement error. The not sure response option was included as researchers suggest that allowing for this response significantly reduces the child's vulnerability to perceiving that there is a right answer (Huon et al., 1997).

The modified OBC-Y comprised nine items; four items on the Body Surveillance subscale and five items on the Body Shame subscale. Scores ranged from 0
to 8 for the Body Surveillance subscale and 0 to 10 for the Body Shame subscale. Higher scores were indicative of increased body surveillance and body shame respectively.

3.3.3.3. SOQ. The SOQ, as described in the introduction, also underwent a series of modifications. First, as a result of ethical concerns with respect to using the term *sex appeal* with young children, this body attribute was substituted with *height*, another appearance-based attribute. The appropriateness of this substitution is supported by research stating that height is a salient beauty standard present in contemporary Western culture and the media (Buote et al., 2011; Carney & Louw, 2006; Forbes, Jobe, & Revak, 2006; Tiggemann & McGill, 2004).

Second, the complex wording used for some of the attributes was changed. *Physical attractiveness* was changed to *good-looking*, *muscle tone* was changed to *muscles*, *physical coordination* was changed to *coordination*, *physical fitness* was changed to *fitness*, and *energy level* was changed to *energy*.

Finally, the presentation of attributes as words only, and the task of mentally ordering the attributes and assigning them a number, was deemed too abstract and difficult for young children. By contrast, visual stimuli are useful for children because pictures make concepts more concrete than verbal representation alone (Scott, 2008). Additionally, pictures hold the limited attention of younger children. As such, each attribute was explained verbally and presented pictorially on A4-size laminated cards. Each card featured an image representing an attribute along with the attribute word in large font. These images comprised both cartoons and actual photographs. The majority of photographs featured children. For example, for the attribute *coordination*, participants were shown a picture of a child throwing a ball. The word “coordination” was written on the card and the interviewer explained the meaning of the word to participants during administration of the measure.
Participants were asked to place the attribute cards in order of importance atop a set of 10 laminated cards bearing the numbers 1 (most important) to 10 (least important). This procedure allowed participants to see how they had ordered the attributes and easily make corrections if necessary. Gender-specific images were used for five of the images (good-looking, muscles, energy, strength, coordination) to increase the validity of the measure. The remaining images were deemed appropriate for both genders and were therefore used when assessing both boys and girls. Presented in Figure 1 are two of these images. All the images used in the Modified SOQ are presented in Appendix B. The interview protocol is presented in Appendix C.

Items were reverse scored and participants’ final scores were computed by summing the ranks for the appearance and competence attributes separately and then computing a difference score. Scores ranged from -25 to +25, with higher scores reflecting a greater emphasis on appearance, interpreted as greater self-objectification.

Figure 1. Attribute images used in the depiction of muscles (for boys) and weight (for both genders) respectively.

3.3.4. Procedure. The candidate interviewed all participants individually in a private room during a regular school day. Each interview took approximately 15 to 20 minutes. The collection of information from participants in the form of individual interviews was considered important as it provided complete privacy during weighing
and measuring and ensured that participants understood the format of responses required and had the opportunity to ask questions about the items if necessary. The assessment procedure also needed to be a standardised procedure suitable for all children. That is, it could not be too difficult for the youngest participants. Given the age of the youngest participants, and the varying vocabulary and cognitive development of children during middle childhood, written responses could not be used as this required writing and reading skills beyond the capacity of a 6-year-old and less capable older children (Goldman & Goldman, 1982). As such, the interview technique was considered particularly appropriate.

Participants were first weighed and measured by the candidate. They were then verbally administered the OBC-Y followed by the SOQ. Each item and possible response options were read to participants. A practice statement (I enjoy playing with my friends) was included prior to administering the OBC-Y to place participants at ease and ensure they understood the response format of the measure. For the SOQ, each attribute was randomly presented for each participant and explained verbally to ensure that participants understood the attribute that each picture depicted. Verbal explanations were standardised across all participants (see Appendix C). An example of how to rank an attribute was provided and participants were then instructed to begin ranking. They were encouraged to ask questions if needed.

3.3.5. Statistical analysis. Reliability and convergent validity of OBC-Y scores were evaluated through CFA, inspection of ordinal alpha coefficients, and inspection of correlations between OBC-Y subscales and SOQ scores. Inspection of correlations between OBC-Y subscales and SOQ scores also provided an indication of the convergent validity of SOQ scores. Independent samples t-tests were conducted to examine gender differences. The specific statistical recommendations followed for each of these analyses are now described.
3.3.5.1. CFA. A CFA of the OBC-Y’s intended factor structure was conducted in *Mplus* 6.0 (L. K. Muthén & Muthén, 2010), a powerful statistical software package and latent variable modelling program with a variety of analysis capabilities including structural equation modelling. *Mplus* was chosen to perform the CFA because of the program’s ability to adequately handle several important characteristics of the OBC-Y data in need of special attention, such as the presence of ordinal variables.

Prior to conducting the CFA, suitable estimation methods were examined. All items on the OBC-Y are ordinal in nature and therefore do not have a multivariate normal distribution (R. B. Kline, 2011). The use of the default maximum likelihood estimator with Pearson product-moment correlation matrices is therefore inappropriate as it is likely to result in biased model fit statistics, negatively biased parameter estimates, and inflated error variances (Bollen, 1989; Flora & Curran, 2004; Flora, Finkel, & Foshee, 2003; Jöreskog, 2005). It has therefore been recommended that factor analyses of ordinal data be conducted on polychoric correlation matrices and using a weighted least squares estimation method, as these methods explicitly account for the discrete distributions of ordinal data and are more robust to the attenuation caused by the scaling of the items (Bollen, 1989; Nunnally & Bernstein, 1994; West, Finch, & Curran, 1995). Given these recommendations, the weighted least squares mean- and variance-adjusted (WLSMV) estimator available in *Mplus* was used to fit the factor model. This estimation method reliably estimates parameters and their standard errors for as many as 20 variables on a minimum sample of 200 participants using a full weight matrix (Beauducel & Herzberg, 2006; T. A. Brown, 2006; Flora & Curran, 2004).

In determining whether the two-factor model provided an acceptable fit to the observed data, model fit statistics, factor loadings, and modification indices were inspected. As no single measure of fit is sufficient for judging the adequacy of a
structural equation model, several fit indices were inspected, including indices of absolute fit and indices of relative fit. Results from analyses using the WLSMV estimator include the mean- and variance-adjusted chi-square ($\chi^2$) test of model fit, the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Weighted Root Mean Square Residual (WRMR), as these fit statistics perform well in the analysis of categorical item data (Yu & Muthén, 2002). For RMSEA, values $\leq .06$ indicate good model fit and values $\leq .08$ indicate an acceptable fit (McDonald & Ho, 2002). For CFI and TLI, values $\geq .95$ indicate good model fit and values $\geq .90$ indicate an acceptable fit (Hu & Bentler, 1999; Yu & Muthén, 2002). Values for WRMR should be $< .90$ (L. K. Muthén & Muthén, 2010), and chi-square should be small relative to the degrees of freedom and nonsignificant.

Although chi-square is the traditional measure for assessing model fit, there are a number of limitations in its use (for a detailed account of these limitations see Hooper, Coughlan, & Mullen, 2008). One particular limitation that impacts this study is chi-square’s sensitivity to sample size and data that depart from normality which, combined, tend to increase chi-square over and above what can be expected due to model specification error (Jöreskog & Sörbom, 1989; Preacher, 2010). As such, this study also evaluated model fit using relative chi-square (Wheaton, Muthén, Alwin, & Summers, 1977), which examines chi-square relative to model degrees of freedom ($\chi^2/df$). As per the recommendations of Ullman (2007), this study will consider a ratio $\leq 2.00$ as indicative of good fit. A value between 2.00 and 5.00 is considered acceptable (Hair, Black, Babin, & Anderson, 2010).

Modification indices and expected parameter change (EPC) estimates were used to examine potential model improvements. As a significant implication of respecifying a model based on post hoc criteria is the potential for capitalisation on the idiosyncrasies
of the particular sample in which the covariance matrix is based, any decisions regarding the implementation of suggested modifications were made with a knowledge of the substantive theory and an adequate assessment of the statistical criteria.

3.3.5.2. Internal consistency and convergent validity. Internal consistency of scores on the Body Shame and Body Surveillance subscales of the OBC-Y was measured using ordinal coefficient alpha calculated in R (R Development Core Team, 2011). Ordinal coefficient alpha (Zumbo, Gadermann, & Zeisser, 2007) was used instead of Cronbach’s alpha as Cronbach’s alpha assumes continuous data and uses a Pearson covariance matrix to calculate reliability. Using a Pearson correlation coefficient on ordinal variables has been shown to result in severe underestimation of the true relationship between items and a deflated magnitude of coefficient alpha (Gadermann, Guhn, & Zumbo, 2012; Zumbo et al., 2007). Cronbach’s alpha also underestimates scale reliability unless the condition of tau equivalence holds (Raykov, 1997). The condition of tau equivalence is not realised in this data set due to the arbitrary measurement scale (T. A. Brown, 2006). By contrast, ordinal coefficient alpha is based on the polychoric correlation matrix, which assumes an underlying continuous variable for each item. The reliability coefficient is then defined by the covariation among these underlying variables (Zumbo et al., 2007). This critical difference between Cronbach’s alpha and ordinal coefficient alpha means ordinal coefficient alpha corrects for the attenuation caused by the scaling of the items and the restriction of range, making it a less biased estimator of the reliability of ordinal data. Indeed, in simulation studies conducted by Zumbo et al. (2007) and Gadermann et al. (2012), ordinal coefficient alpha based on a polychoric correlation matrix was consistently found to estimate the reliability of ordinal response scales more accurately and suitably than Cronbach’s alpha, regardless of the number of scale points, the degree of skewness of the scale point distribution, and the magnitude of theoretical reliability.
As described, given the scoring system of the SOQ (i.e., the subtraction of a sum of ranks), traditional internal consistency estimates cannot be provided for scores on this measure (Vanleeuwen & Mandabach, 2002). Convergent validity of scores was examined, however, through the inspection of correlations between OBC-Y subscales and SOQ scores generated in SPSS.

3.4. Results

3.4.1. Data suitability. Prior to analysis, data were examined for missing values and outliers (both univariate and multivariate). Missing values arose as a result of participants responding not sure on the OBC-Y (n = 7; 3.21%). The default pairwise deletion approach for treating missing values when using the WLSMV estimator was not used, as this method can give rise to out-of-range correlations and covariances, which may result in nonpositive definite covariance (R. B. Kline, 2011; Schreiber, Nora, Stage, Barlow, & King, 2006). Missing values were therefore treated listwise since incomplete cases attributable to missing data comprised less than 5% of the number of total cases making biases and loss of power inconsequential (Cameron & Trivedi, 2005; Graham, 2009). Additionally, participants who responded not sure did not differ significantly from participants without these missing values on any demographic variables, nor on the variables of interest, and Little's MCAR test was not significant, \( \chi^2(45) = 43.90, p = .519 \), indicating that the data were missing completely at random. Listwise deletion therefore presented a suitable, valid, and logical strategy that allowed for relevant fit indices to be obtained.\(^1\)

\(^1\)Multiple imputation is the recommended procedure for treating missing values (Enders, 2010; Rubin, 1996; Schafer & Graham, 2002). However, methodologists have yet to develop principled approaches and supporting statistical theory for pooling fit indices when multiply imputed datasets are estimated using the WLSMV estimator. Given the important role that the assessment of fit plays in the present study, the lack of pooling is a serious drawback to using multiple imputed datasets.
Univariate outliers were defined as those with a score ± 3.29 standard deviations from the mean (corresponding to a significance level of .001; Tabachnick & Fidell, 2001). No scores met this criterion. Mahalanobis distance was used to detect multivariate outliers. No multivariate outliers were detected. Data were examined through SPSS to ensure the assumptions of normality and linearity were met. The observed variables of body shame, body surveillance, and self-objectification showed no signs of significant skewness or kurtosis with these statistics < 2 and < 4 respectively. Inspection of scatterplots revealed linear relationships among the variables.

Finally, data were explored to ensure they met the additional assumptions required for a CFA. With an effective sample size of 211 and 19 parameters to be estimated, the ratio of 11 participants to 1 parameter estimate was acceptable. With no correlations over .85, multicollinearity was not suggested. Additionally, the model to be tested met the requirements for overidentification, with at least three indicator variables per latent variable, no nondirected pathways between causally ordered variables, and positive degrees of freedom ($df_M = 26$).

**3.4.2. CFA.** It was hypothesised that the OBC-Y’s nine items would load on two factors corresponding to the two subscales of the modified OBC-Y: Body Shame and Body Surveillance. As is customary in traditional CFA, factors were allowed to covary and error terms were uncorrelated with one another. The correlation matrix associated with this analysis is presented in Table 1.
Table 1

*Correlation Matrix (in Lower Diagonal) and Residual Correlation Matrix (in Upper Diagonal) Associated With a Two-Factor Model of the OBC-Y*

<table>
<thead>
<tr>
<th>Item</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>1. OBCY1</td>
<td>–</td>
<td>-0.03</td>
<td>-0.04</td>
<td>-0.07</td>
<td>0.23</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>2. OBCY2</td>
<td>0.12</td>
<td>–</td>
<td>-0.14</td>
<td>0.07</td>
<td>0.14</td>
<td>-0.10</td>
<td>0.03</td>
<td>-0.10</td>
<td>0.13</td>
</tr>
<tr>
<td>3. OBCY3</td>
<td>0.34</td>
<td>0.05</td>
<td>–</td>
<td>0.07</td>
<td>-0.13</td>
<td>0.04</td>
<td>0.03</td>
<td>0.08</td>
<td>-0.10</td>
</tr>
<tr>
<td>4. OBCY4</td>
<td>0.22</td>
<td>0.21</td>
<td>0.43</td>
<td>–</td>
<td>0.01</td>
<td>-0.03</td>
<td>-0.05</td>
<td>0.10</td>
<td>-0.14</td>
</tr>
<tr>
<td>5. OBCY5</td>
<td>0.40</td>
<td>0.30</td>
<td>0.08</td>
<td>0.17</td>
<td>–</td>
<td>0.05</td>
<td>-0.17</td>
<td>-0.12</td>
<td>-0.02</td>
</tr>
<tr>
<td>6. OBCY6</td>
<td>0.37</td>
<td>0.09</td>
<td>0.51</td>
<td>0.33</td>
<td>0.26</td>
<td>–</td>
<td>-0.05</td>
<td>-0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>7. OBCY7</td>
<td>0.20</td>
<td>0.20</td>
<td>0.26</td>
<td>0.13</td>
<td>0.03</td>
<td>0.18</td>
<td>–</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>8. OBCY8</td>
<td>0.24</td>
<td>0.18</td>
<td>0.44</td>
<td>0.37</td>
<td>0.18</td>
<td>0.32</td>
<td>0.39</td>
<td>–</td>
<td>0.00</td>
</tr>
<tr>
<td>9. OBCY9</td>
<td>0.31</td>
<td>0.39</td>
<td>0.22</td>
<td>0.11</td>
<td>0.26</td>
<td>0.36</td>
<td>0.33</td>
<td>0.48</td>
<td>–</td>
</tr>
</tbody>
</table>

When the two-factor model of the OBC-Y was fitted to the data, a converged, admissible solution was obtained. Although the chi-square statistic was significant, \( \chi^2(26) = 43.52, p = .017 \), relative chi-square was 1.67 suggesting adequate fit. Other fit indices indicated that the hypothesised factor model of the OBC-Y met all the standards outlined for an adequate fit to the data, with TLI = .92, CFI = .94, RMSEA = .06, RMSEA 90% CI [.02, .09], and WRMR = 0.79. The majority of residuals (which examine the discrepancy between observed correlations and model-reproduced correlations) were small and centered around zero (see Table 1), indicating that the two-factor model explained the observed correlations relatively well and the factor solution was a good representation of the relationships among the observed variables. There was a sizable residual (0.23) between OBCY1 (*During the day, I think about how I look many times*) and OBCY5 (*When I’m not exercising enough, I question whether I am a good person*), however, suggesting the model does not adequately estimate the relationship between these two items.
In the interest of model comparison (R. B. Kline, 2011), a one-factor model was also tested. The chi-square statistic was significant, $\chi^2(27) = 54.38, p < .001$. Additionally, relative chi-square was 2.01 and other fit indices were suggestive of poor fit (CFI = .90, TLI = .87, WRMR = 0.91), indicating that the two-factor model should be retained.

Individual elements of the model were examined next. Unstandardised item coefficients and standard errors are presented in Table 2. Standardised item coefficients and standard errors are presented in Figure 2. All items loaded significantly on their specified subscale. Additionally, all items, with the exception of OBCY 2 (I would be ashamed for people to know what I really weigh), performed strongly with standardised parameter estimates greater than 0.40 on their associated factor. The two subscales were highly correlated ($p < .001$), suggesting that two related dimensions underlie the OBC-Y. There were no Heywood cases, out-of-range covariances, large standard errors, or unique variances close to zero, supporting the plausibility of parameter estimates.

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2 Although using multiply imputed datasets with the WLSMV estimator does not produce statistically supported fit indices, unbiased parameter estimates and standard errors are provided. Multiple imputation was therefore used to create 25 data sets, and the two-factor model was estimated using WLSMV. In comparison to the estimates obtained via listwise deletion, factor loadings differed by $< 0.03$ and standard errors differed by $< 0.002$, suggesting that the implementation of listwise deletion did not result in significantly biased estimates.
Table 2

*Unstandardised Item Coefficients and Standard Errors for a Two-Factor Model of the OBC-Y*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Indicator</th>
<th>Mean (SD)</th>
<th>b</th>
<th>SE</th>
<th>b/SE</th>
<th>p</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Surveillance</strong></td>
<td>OBCY1: During the day, I think about how I look many times</td>
<td>0.74 (0.73)</td>
<td>1.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY3: I often worry about whether the clothes I am wearing make me look good</td>
<td>0.73 (0.83)</td>
<td>1.24</td>
<td>0.21</td>
<td>5.81</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY4: I often compare how I look with how other people look</td>
<td>0.59 (0.80)</td>
<td>0.95</td>
<td>0.21</td>
<td>4.53</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY6: I often worry about how I look to other people</td>
<td>0.54 (0.75)</td>
<td>1.24</td>
<td>0.21</td>
<td>5.85</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td><strong>Body Shame</strong></td>
<td>OBCY2: I would be ashamed for people to know what I really weigh</td>
<td>0.60 (0.84)</td>
<td>1.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY5: When I’m not exercising enough, I question whether I am a good person</td>
<td>0.71 (0.87)</td>
<td>1.09</td>
<td>0.31</td>
<td>3.49</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY7: I feel like I must be a bad person when I don’t look as good as I could</td>
<td>0.25 (0.57)</td>
<td>1.20</td>
<td>0.40</td>
<td>3.03</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY8: I feel ashamed of myself when I haven’t made an effort to look my best</td>
<td>0.60 (0.81)</td>
<td>1.88</td>
<td>0.50</td>
<td>3.74</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY9: When I’m not the size I think I should be, I feel ashamed</td>
<td>0.57 (0.82)</td>
<td>1.71</td>
<td>0.45</td>
<td>3.81</td>
<td>&lt; .001</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* For identification purposes, one factor loading per latent variable was fixed at 1.00. These pathways were neither estimated nor tested.
One modification index (MI value = 11.99, EPC = 0.28) was suggested in the form of a covariance pathway between OBCY1 (During the day, I think about how I look many times) and OBCY5 (When I'm not exercising enough, I question whether I am a good person). This modification indicates a possible relationship between these items; however, the inclusion of this pathway is not theoretically justified and was therefore not employed.

**Figure 2.** Standardised item coefficients (and standard errors) for a two-factor model of the OBC-Y. All factor loadings are significant at \( p < .001 \).

### 3.4.3. Internal consistency.

The values obtained for ordinal coefficient alpha are presented in Table 3. This table presents ordinal coefficient alphas for the Body Shame and Body Surveillance subscales of the OBC-Y in the overall sample and separated by gender and age group. As can be seen, according to the general psychometric literature (e.g., Nunnally, 1978), the internal consistency of scores on the OBCY’s Body Surveillance and Body Shame subscales for the entire sample was
bordering acceptable. When examining ordinal alpha by gender, it is evident that internal consistency of scores on the Body Shame subscale was poor in the male subsample, but acceptable in girls. When examined by age, ordinal alphas were similar in both age groups.

Table 3

*Internal Consistency (Ordinal Coefficient Alpha) for the Body Shame and Body Surveillance Subscales of the OBC-Y*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Overall</th>
<th>Gender</th>
<th>Age (in years)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>6–8</td>
<td>9–11</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>.69</td>
<td>.68</td>
<td>.69</td>
<td>.67</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>(n = 218)</td>
<td>(n = 108)</td>
<td>(n = 110)</td>
<td>(n = 119)</td>
<td>(n = 99)</td>
</tr>
<tr>
<td>Body Shame</td>
<td>.65</td>
<td>.56</td>
<td>.72</td>
<td>.63</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>(n = 211)</td>
<td>(n = 103)</td>
<td>(n = 108)</td>
<td>(n = 119)</td>
<td>(n = 99)</td>
</tr>
</tbody>
</table>

To confirm these results, reliability of scores in the overall sample was also calculated using the maximal reliability measure Coefficient $H$ (Hancock & Mueller, 2001). This coefficient uses factor loadings obtained from a CFA of the measure under investigation to provide an indication of the degree to which the construct is captured by the information found within its measured indicators. It is bounded by 0 and 1, with a larger coefficient indicating that the items represent a larger proportion of the variance in the latent construct. Hancock and Mueller (2001) recommend values ≥ .70 for Coefficient $H$. When the loadings presented in Figure 2 were used to calculate Coefficient $H$, a Coefficient $H$ of .72 was found for scores on the Body Surveillance subscale and a Coefficient $H$ of .71 was found for scores on the Body Shame subscale, indicative of adequate reliability.
3.4.4. Convergent validity. As a test of convergent validity, the Body Shame and Body Surveillance subscales of the OBC-Y were correlated with the SOQ and with each other. These analyses revealed small to moderate significant positive correlations between the Body Surveillance subscale and the SOQ ($r = .32, p < .001$), between the Body Shame subscale and SOQ ($r = .25, p < .001$), and between the Body Shame and Body Surveillance subscales ($r = .40, p < .001$), providing preliminary support for the validity of scores on modified versions of the SOQ and OBC-Y. The pattern differed between boys and girls. As can be seen in Table 4, all correlations were higher in girls than in boys, significantly higher in the case of self-objectification and body shame ($z_{\text{diff}} = -1.92, p < .027$, one-tailed) and body shame and body surveillance ($z_{\text{diff}} = -2.10, p = .018$, one-tailed). Indeed, when observing the data by gender, it becomes apparent that the relationship between self-objectification and body shame is not significant in boys.

Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td>1. Self-objectification</td>
<td>–</td>
<td>–</td>
<td>.28**</td>
</tr>
<tr>
<td>2. Body Surveillance</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3. Body Shame</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.

3.4.5. Effects of gender, BMI z-score, and age. A goal of this study was to examine gender, BMI z-score, and age differences in body shame, body surveillance, and self-objectification among children. Means and standard deviations of the variables of interest for the overall sample and for boys and girls separately are presented in Table 5. Girls reported significantly greater body surveillance than boys, $t(216) = -2.15$, 
There were no significant differences between boys and girls on body shame, \( t(205.02) = -1.17, p = .244, d = -0.16 \), or self-objectification, \( t(208.10) = -1.29, p = .198, d = -0.18 \).

Table 5

Means (and Standard Deviations) of Body Surveillance, Body Shame, and Self-Objectification for the Overall Sample and Separated by Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body surveillance</td>
<td>2.62 (2.10)</td>
<td>2.31 (1.95)</td>
<td>2.91 (2.19)</td>
</tr>
<tr>
<td></td>
<td>( n = 218 )</td>
<td>( n = 108 )</td>
<td>( n = 110 )</td>
</tr>
<tr>
<td>Body shame</td>
<td>2.75 (2.32)</td>
<td>2.54 (2.09)</td>
<td>2.92 (2.53)</td>
</tr>
<tr>
<td></td>
<td>( n = 211 )</td>
<td>( n = 103 )</td>
<td>( n = 108 )</td>
</tr>
<tr>
<td>Self-objectification</td>
<td>-13.18 (8.86)</td>
<td>-13.96 (7.84)</td>
<td>-12.42 (9.73)</td>
</tr>
<tr>
<td></td>
<td>( n = 218 )</td>
<td>( n = 108 )</td>
<td>( n = 110 )</td>
</tr>
</tbody>
</table>

The association between the variables of interest and BMI \( z \)-score and age were examined next. Table 6 presents Pearson correlations among these variables for the overall sample and for boys and girls separately. BMI \( z \)-score was significantly and positively correlated with body shame and self-objectification in girls, and significantly and positively correlated with body shame in boys. Age was significantly negatively correlated with body surveillance, body shame, and self-objectification in girls, and significantly negatively correlated with body surveillance and self-objectification in boys.
Table 6

*Pearson Correlations Between the Variables of Interest and Age and BMI z-score in the Overall Sample and Separated by Gender*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age</td>
<td>BMI z</td>
<td>Age</td>
</tr>
<tr>
<td>Body surveillance</td>
<td>-.32**</td>
<td>.14*</td>
<td>-.44**</td>
</tr>
<tr>
<td>Body shame</td>
<td>-.23**</td>
<td>.25**</td>
<td>-.12</td>
</tr>
<tr>
<td>Self-objectification</td>
<td>-.27**</td>
<td>.14*</td>
<td>-.33**</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01.

3.5. Discussion

The present study developed modified versions of the OBC-Y and SOQ that could be used with child samples. These measures were then psychometrically evaluated in an Australian sample of 6- to 11-year-old children, with this study seeking to: (a) confirm the factor structure of the modified OBC-Y; (b) examine estimations of internal reliability and convergent validity for scores obtained from modified versions of the OBC-Y and SOQ; and (c) examine the relationship between these two measures and gender, BMI z-score, and age.

3.5.1. CFA. The factor structure of the modified OBC-Y was consistent with its intended scale structure, with results from the CFA identifying the two-factor model as providing an acceptable fit to the observed data. This finding supports the first hypothesis of this study: that the two-factor structure of Body Surveillance and Body Shame observed by Lindberg et al. (2006) for the OBC-Y would be replicated.

Although a significant chi-square was found, relative chi-square was less than 2.00 and all other fit statistics indicated that the subscale structure provided a good or adequate fit to the data. Additionally, all items loaded significantly on their respective factors. This
supports the results of Lindberg et al. (2006), who also found that a two-factor model of the OBC-Y provided an adequate fit to the data in their sample of 10- to 12-year-olds. Although Lindberg et al. reported a significant chi-square for their two-factor model, as with the present study, additional fit indices indicated that the two-factor model demonstrated a good fit to the data.

With respect to the individual items of the OBC-Y, OBCY5 (*When I'm not exercising enough, I question whether I am a good person*) did not appear to factor well, as indicated by a large residual correlation between this variable and OBCY1 (*During the day, I think about how I look many times*), and a modification index suggesting that OBCY5 and OBCY1 should be correlated. It is possible that OBCY5 did not factor well because the experience of shame as a result of not exercising may not be related specifically to body shame and the effect of exercise on body shape and appearance. Rather, it may be related more broadly to the experience of shame as a result of poor health and fitness, issues that are strongly enforced in primary schools through health and physical education classes embedded in the school curriculum (Department of Education, 2010). Additionally, the more complex wording associated with this item in comparison to the other OBC-Y items may have made it more difficult for children to understand, resulting in more erroneous and inconsistent reporting. Future researchers may wish to consider deleting this item from the scale.

### 3.5.2. Psychometric properties.

#### 3.5.2.1. Internal consistency.

The internal consistency of scores on the two subscales of the OBC-Y was found to be moderately adequate for research purposes as determined by ordinal coefficient alpha and the maximal reliability measure Coefficient $H$. The small number of items on each subscale may be responsible, in part, for these estimates bordering on adequate. The complexity of the items comprising the OBC-Y may have also contributed to the borderline acceptable estimates. The items may have...
been too difficult for many children to comprehend. Future researchers may wish to consider making modifications to the actual wording of the OBC-Y items in addition to the modifications made to the response options.

When examined by gender, internal consistency of scores on the Body Shame subscale was poor in boys, suggesting that this subscale may not be reliable in this population. The poor psychometric performance of this subscale in boys may reflect a lack of awareness and understanding of body image issues, and a lack of salience of the concept of body shame, in 6- to 11-year-old boys.

3.5.2.2. Convergent validity. The significant and positive relationship observed between the Body Surveillance subscale and the Body Shame subscale provides initial support for the validity of scores of the modified OBC-Y and suggests that individuals who closely monitor the appearance of their bodies are more likely to experience body shame. This finding is further supported by the significant covariance between the Body Surveillance and Body Shame factors in the CFA and indicates a degree of convergent validity between these two subscales. This covariance is not so high, however, to suggest that children may have difficulty differentiating between the two domains of objectified body consciousness. These results support previous research by Lindberg et al. (2006). In fact, the covariance between the latent factors of Body Surveillance and Body Shame in the present study did not differ significantly from the covariance between these latent factors observed by Lindberg et al. (.72 vs. .69 respectively, $z_{\text{diff}} = -0.50, p = .617$).

The significant and positive associations identified between scores on the SOQ and OBC-Y subscales provide preliminary support for the relationship between the constructs being measured and the validity of scores on modified versions of the SOQ and OBC-Y. These associations support previous research by T. A. Roberts (2004), who found significant, moderate correlations between the SOQ and both OBC subscales in
an older sample of females. The correlation between the SOQ and the Body Shame subscale observed for girls in the present study did not significantly differ from the correlation found by Roberts ($z_{diff} = -0.64, p = .522$), suggesting that the association between self-objectification and body shame in the present sample of young girls does not differ from the association found between these two constructs in older populations, further supporting the validity of these scores.

3.5.3. Effects of gender, BMI $z$-score, and age.

3.5.3.1. Gender. In support of the gender differences inherent in body image disturbance (Calogero & Thompson, 2010; Fredrickson et al., 1998; Striegel-Moore & Smolak, 2002), and previous research by Lindberg et al. (2006) and Slater and Tiggemann (2010), girls in the present study reported significantly greater body surveillance than boys. However, there were no significant differences between boys and girls in regards to body shame or self-objectification. This finding supports Hypothesis 2 (that girls would experience higher levels of body surveillance, but not body shame, than boys) and Lindberg et al.’s (2006) suggestion that gender differences in body shame may have not yet emerged in preadolescents. Perhaps gender differences in body shame are more likely to emerge in adolescence when physical maturation and the associated body changes during adolescence (e.g., significant gain of body fat, particularly around the hips and thighs) move girls away from the ideal body type valued by society whilst simultaneously moving boys towards the masculine ideal by increasing muscle mass and lean tissue (Clifford, 1971; Levine & Smolak, 2002; Stice, Hayward, Cameron, Killen, & Taylor, 2000; Striegel-Moore et al., 1986). Indeed, in a test of objectification theory in 12- to 16-year-old boys and girls by Slater and Tiggemann (2010), girls had significantly higher scores than boys on both body surveillance and body shame, providing support for the suggestion that gender differences in body shame emerge at a later age.
The present study extends previous research by providing evidence that the gender difference in body surveillance may emerge earlier than previously reported, with girls reporting more body surveillance than boys by the age of 6. Furthermore, correlations between the SOQ and Body Shame subscale, and between the Body Shame and Body Surveillance subscales, were significantly larger in girls than in boys. This result is not unexpected. The appearance norms encountered by females in daily life are more rigid, homogenous, and pervasive than those encountered by males (Buote et al., 2011). Females are also more likely than males to be socialised towards adopting the contemporary female beauty ideal of extreme thinness and physical attractiveness (Striegel-Moore & Smolak, 2002). Additionally, as males are not routinely evaluated in terms of their appearance, they may not internalise an observer’s perspective of their bodies as readily as females do (McKinley, 2002). It follows that body image concepts, such as self-objectification and body shame, are likely to be more closely linked for girls than for boys. Combined, these findings support a core tenet of objectification theory: that gender is a key influence in individuals’ experiences of self-objectification. This apparent gender difference is an important finding to explore in future studies examining the effects of self-objectification on body image disturbance and eating disorder symptomatology.

3.5.3.2. BMI z-score. In support of Hypothesis 3 (that BMI z-score would be positively related to body shame, but not body surveillance and self-objectification), the relationship between BMI z-score and body shame was found to be significant in both boys and girls, suggesting that boys may also be vulnerable to experiencing body shame, particularly when they have a larger body size. The relationship between body surveillance and BMI z-score failed to reach significance when examined in boys and girls separately, although given this finding was significant in the overall sample, low power may have precluded this finding from reaching significance when examined by
gender. BMI z-score was also found to be significantly and positively correlated with self-objectification in girls. Given that only 19% of girls in the present study were overweight or obese, the finding of a significant relationship between BMI z-score and self-objectification in girls suggests that while girls of any weight may self-objectify, larger girls experience greater self-objectification. This finding stands in contrast to previous research in adults by Fredrickson et al. (1998), Calogero et al. (2005), Myers and Crowther (2007), and Tiggemann and Lynch (2001), who found no relationship between BMI and self-objectification.

3.5.3.3. Age. Contrary to Hypothesis 4 (that older children approaching adolescence would experience higher levels of self-objectification, body shame, and body surveillance than younger children), age was significantly and negatively correlated with body surveillance, body shame, and self-objectification in girls, and significantly and negatively correlated with body surveillance and self-objectification in boys. While unexpected, increased body image concerns in younger children compared to older children have previously been reported (e.g., Rolland et al., 1997). These findings are usually explained as being a result of younger children not having the cognitive ability to understand the questions being asked of them. In children, both cognitive ability and communication skills are still developing, and these vary considerably between children, potentially creating differences in the reliability of responses. However, an examination of ordinal reliability by age group revealed that ordinal coefficient alphas did not significantly differ between the older and younger children in the present sample. Additionally, it has been suggested that as long as the questions posed are about the here and now or very recent past, primary-school-aged children are able to give articulate and informative responses (Scott, 2008). Alternative explanations for the unexpected age results should therefore be considered.
One such explanation concerns social desirability. Older children in the present study may have had more of an understanding of what is considered a “good” or “bad” thing to say because they have internalised social and moral norms (Turiel, 2006). As a result, they may have censored their reports of body shame, body surveillance, and self-objectification. By contrast, younger children are less aware of moral and social conventions and are less likely to engage in self-presentation (Aloise-Young, 1993; Banerjee, 2002; Rutland, Cameron, Milne, & McGeorge, 2005). As such, younger children may have more frankly acknowledged their experiences of body shame, body surveillance, and self-objectification. In support of this suggestion, Scott (2008) and Fine and Sandstrom (1988) have argued that whilst older children are considered more adept at processing and responding to questions, they are also more likely than younger children to engage in impression management and are acutely aware of their sense of privacy and unwanted prying by an experimenter. Wood et al. (1996) have further argued that whilst 12- to 13-year-olds may be unwilling to respond to direct questioning concerning their weight (minimising their dissatisfaction in the presence of an interviewer), younger children may provide useful information if questions are asked in the right environment. Given the sensitive subject matter being discussed in the present study, the negative relationship between age and the constructs of interest may reflect the reticence of older children to communicate their thoughts and feelings on this particular topic. This finding may therefore not be reflective of a genuine decrease in body image issues but rather an increasing desire for privacy on the part of the older participants.

Although speculative, the unexpected findings with respect to age may also be explained by differences in media literacy. It may be that, compared to younger children, older children in the present study were more media literate, making them more resilient to messages of objectification emanating from the media. A related
proposition concerns differences in child development. In a longitudinal study by McCabe and Ricciardelli (2005), it was hypothesised that due to the developmental changes that occur between childhood and adolescence (e.g., changes in body size and shape), both boys and girls would demonstrate increases in weight and muscle dissatisfaction and would place greater importance on weight and muscularity as they approached adolescence.

McCabe and Ricciardelli (2005) found the opposite, however; as children approached adolescence, there was a reduction in the reported importance of weight and muscularity in 8- to 12-year-old boys and girls. McCabe and Ricciardelli argued that this reduction is actually consistent with developmental changes in children’s self-concept. They reasoned that in the first few years of primary school there is a decrease in children’s evaluations of their self-worth and abilities as children increasingly engage in social comparisons. As they begin to balance these social comparisons with other personal achievement goals, their self-evaluation becomes more positive. McCabe and Ricciardelli posited that this shift occurs around Grade 4, or age 9. It is therefore possible that children at younger ages are more susceptible to messages regarding weight and shape because: (a) they may be engaging more than older children in outward social comparisons to gauge self-worth; (b) they may not yet have learnt to base their self-worth on other personal achievements, such as academic ability; and/or (c) they may not have the skills to properly judge what they see and adopt a critical attitude towards the media. The lower levels of body shame, body surveillance, and self-objectification reported by older children in the present study may therefore reflect the increasingly positive self-evaluations that occur in late childhood.

3.5.4. Limitations. The present study had some limitations that need to be taken into account when interpreting the findings. First, the requirement of active parental consent resulted in a low participation rate of 14%. Although it is typical for consent
rates of studies requiring active consent to be significantly lower than those requiring passive consent (Pokorny, Jason, Schoeny, Townsend, & Curie, 2001), it cannot be assumed that the sample was representative of the population from which it was drawn. For instance, results may have been affected by sampling. The proportion of overweight and obese children in the present sample (14%) was lower than what would be expected based on the national average for overweight in children of 25% (Australian Bureau of Statistics, 2013). Given the nature of the study, it could be that parents of overweight children did not want their children asked questions pertaining to physical appearance and, as such, did not consent for them to participate.

Second, although the present sample comprised participants from fairly diverse socioeconomic status areas, it also comprised predominantly Caucasian participants. As such, whilst this study has gone some way in developing measures for use in young children, future studies should explore whether the findings from this study can be replicated, particularly in a sample of ethnically diverse children. It can be suggested, however, that given the consistency of the present findings with previous US and Australian research, the OBC-Y and SOQ may be used in samples of children from Western societies characterised by objectification.

Third, participants were weighed before being administered the measures. It could be that weighing before the assessment primed participants to think about their weight and affected their responses. Finally, although the fit statistics for the CFA conducted on the OBC-Y were acceptable, they cannot be considered equivocally good. Additionally, convergent validity was only assessed by examining correlations between the SOQ and OBC-Y. Further evaluation of the psychometric properties of these scales is necessary, for example by comparing these measures to other body image measures and by evaluating test-retest reliability and discriminant validity.
3.5.5. Strengths. Despite these limitations, the present study had several strengths. First, to a large extent, the use of one–on–one interviews provided a way to deal appropriately with the sensitive nature of body image issues whilst also allowing for the assessment process to be appropriate for children of all ages. Second, the assessment of BMI using measured values of weight and height instead of relying on self-report or parental report increased the accuracy of BMI analyses. Third, the use of CFA as a statistical technique provided several advantages, including its more flexible assumptions and its ability to test both the hypothesised model overall and individual coefficients. Finally, this study began the process of developing measures that will help extend objectification theory to a younger population. Combined, these strengths contribute to the utility of this study.

3.5.6. Conclusion. In summary, results from the present study found preliminary evidence that modified versions of the OBC-Y and SOQ provide scores that are internally reliable and valid measures of body surveillance, body shame, and self-objectification in Australian children aged 6 years and over. The factor structure, internal consistency, and convergent validity of scores on the OBC-Y, and the convergent validity of scores on the SOQ, were mostly adequate, particularly in girls, suggesting they are appropriate for research purposes. In boys, the reliability of scores on the Body Shame subscale was low, however. Should future researchers choose to utilise this measure in boys, a sample-specific examination of internal reliability is warranted.

The modification of the SOQ and OBC-Y for use in children means that research on self-objectification can be extended in ways not previously possible. More specifically, it is now possible to test hypotheses regarding objectification theory and the development of eating disorder symptoms in children. In the next four chapters, the
modified measures evaluated in the present chapter are used to conduct both cross-sectional and prospective investigations of objectification theory in children.
Chapter 4. Study 2a: Self-Objectification, Body Image Disturbance, and Eating Disorder Symptoms in Young Australian Children

4.1. Overview

As noted in Chapter 1, maladaptive cognitive and behavioural eating disorder symptoms have been observed in a significant minority of girls and boys. The role of self-objectification in the development of these symptoms was of primary interest to this thesis. However, an account of the degree to which children self-objectify is lacking in previous research. Given the development of appropriate measures of self-objectification, body surveillance, and body shame in Study 1 (Chapter 3), the present study sought to extend previous research with adolescent and adult samples by examining the degree to which children self-objectify and the prevalence of body image disturbance and eating disorder symptoms in this population.

4.2. Introduction

Objectification theory, as it applies to children, has been the subject of limited research attention. As such, there is a lack of empirical data on the role of self-objectification in the development of eating disorder symptoms in this population. Although the evidence presented in Chapter 2 (Section 2.5) provides support for the suggestion that children could come to self-objectify, researchers have yet to determine whether children do self-objectify, and until such research is conducted anecdotal claims regarding the potential consequences of objectification in children cannot be validated (Carmody, 2010, March 21; Farr, 2011, May 6; Hunter, 2009, November 11; M. Irving, 2008, August 2; McKimmie, 2012; McPhee, 2010, March 18).

The paucity of research examining self-objectification in children not only makes it difficult to determine whether children self-objectify, but also whether the various findings relating to self-objectification in adults extend to children. For example, research from the adult literature has consistently found self-objectification to
be uncorrelated with body mass (Calogero et al., 2005; Fredrickson et al., 1998; Myers & Crowther, 2007; Tiggemann & Lynch, 2001). Of the few studies that have examined gender differences, it has been fairly consistently observed that females report significantly higher levels of self-objectification than males (Aubrey, 2006; Calogero, 2009; Tiggemann & Kuring, 2004). An examination of whether these findings extend to children is required. This information would allow researchers to identify subpopulations of children that may be particularly at risk for experiencing self-objectification.

If levels of self-objectification in children are comparable to those found in older populations, then it can be suggested that children may also be vulnerable to the negative psychological consequences of self-objectification that have been found in adults, such as body image disturbance and eating disorder symptoms. Although the prevalence of diagnosable eating disorders is relatively low in children, body image disturbance and eating disorder symptoms have been observed in a significant minority of children, with body dissatisfaction reported by 32% to 55% of girls and 15% to 44% of boys (Berger et al., 2005; Clark & Tiggemann, 2008; Dohnt & Tiggemann, 2006; McVey, Tweed, et al., 2004; Olvera et al., 2005; Ricciardelli & McCabe, 2001a; Ricciardelli et al., 2003). A significant proportion of both boys and girls (including healthy-weight and underweight children) have also reported the use of weight-loss strategies such as dieting and exercise (Combs et al., 2011; Davison et al., 2003; Field, Camargo, et al., 1999; Kostanski & Gullone, 1999; Madden et al., 2009; O'Dea & Caputi, 2001; Rolland et al., 1997; Tanofsky-Kraff et al., 2004).

However, as described in Chapter 1 (Section 1.3.4), whilst it is clear that children do experience body image disturbance and eating disorder symptomatology, the prevalence of these disturbances in children is difficult to ascertain as previous research has been hampered by the varying methods used to assess body image
disturbance and eating disorder symptoms in children, and by the widely varying, and predominantly small, sample sizes used in these studies. There is also a lack of consensus with respect to gender differences. For example, Ricciardelli et al. (2003) found no gender differences in body dissatisfaction, desire for a thinner body, the importance placed on weight, and the utilisation of strategies to lose weight. In the same study, however, boys were more likely than girls to desire a larger body size, and other studies have reported that boys place greater emphasis on strategies to increase muscularity, such as exercising (Bayes & Madden, 2011; Weltzin et al., 2005). It is clear that more rigorous research needs to be conducted in a large sample of children to provide a more accurate account of body image disturbance and eating disorder symptoms in both boys and girls.

4.2.1. Present study. The present study aimed to extend previous research by utilising both a cross-sectional and prospective design to examine levels of self-objectification, body image disturbance, and eating disorder symptoms in Australian boys and girls. Two components of the multifaceted construct of body image were assessed: perceptual body image (an individual’s ability to accurately perceive or estimate their body shape and size) and attitudinal body image (the affective, cognitive, and behavioural concerns with one’s body size; T. A. Brown, Cash, & Mikulka, 1990; Jung & Peterson, 2007; Muth & Cash, 1997). A secondary aim of this study was to examine gender and weight category differences in self-objectification, body image disturbance, and eating disorder symptomatology.

Given the exploratory nature of this study with respect to self-objectification, no specific hypotheses were made. However, two hypotheses regarding body image disturbance were proposed. Whilst findings on gender differences are mixed, based on the weight of previous evidence, it was hypothesised that girls would report greater body image disturbance and eating disorder symptoms than boys (Calogero &
Thompson, 2010; Fredrickson et al., 1998; Striegel-Moore & Smolak, 2002). Based on previous research findings, it was also predicted that overweight/obese children would report greater body image disturbance and eating disorder symptoms than healthy-weight children (Franklin, Denyer, Steinbeck, Caterson, & Hill, 2006; Tanofsky-Kraff et al., 2004; Vander Wal & Thelen, 2000).

4.3. Method

4.3.1. Design. The present study was longitudinal in nature, with information utilised from three assessment points: baseline (Time 1; T1), 1-year follow-up (Time 2; T2), and 2-year follow-up (Time 3; T3). Analyses were both cross-sectional and longitudinal. Cross-sectional analyses were conducted on T1 data using the effective baseline sample of 247 children. Longitudinal analyses were conducted for those participants who remained a part of the sample at all three assessment points (n = 219). Data collection occurred between February 2010 and June 2012.

4.3.2. Participants and recruitment procedures. A summary of recruitment procedures and participant details, including response rate throughout the recruitment and interviewing processes, is presented in Figure 1. Following ethical approval from the University of Western Australia’s Human Research Ethics Committee and the respective ethics committees for private and state schools in Western Australia (Catholic Education Office and Department of Education and Training respectively), 253 children (109 boys, 144 girls) were recruited from nine randomly selected metropolitan primary schools in Perth, Western Australia. The schools, five private and four state, varied with regard to geographical location (four schools located north of Perth, one school located south of Perth, three schools located east of Perth, and one school located west of Perth) and socioeconomic status (two schools drawing on lower socioeconomic areas, two schools drawing on middle socioeconomic status areas, and five schools drawing on higher socioeconomic status areas). Socioeconomic status was
estimated using the Australian Bureau of Statistics' (2008) Socioeconomic Indexes for Areas 2006 rankings for the suburb where each school was located.

After written approval from school principals was granted, a comprehensive letter of introduction describing the purpose and procedures of the study was sent to the parents of all children in Grades 1 to 5, inviting their children into the study and requesting parental approval. Assent forms for children were attached to this invitation. Children who received parental consent and provided assent forms were recruited into the study. The consent rate from this process is detailed in Figure 1. Information on those who did not provide active consent was not obtained.

Demographic data collected from consenting parents included their child’s date of birth, gender, school grade, and ethnicity (extrapolated from parental ethnicity). Almost 23% of parents did not report ethnicity. Of those who did, 84% were Caucasian, 6% were Asian, and 10% were categorised as “Other” (e.g., Indian, Maori). At T1, participants were in Grades 1 (n = 56; 22%), 2 (n = 39; 15%), 3 (n = 56; 22%), 4 (n = 58; 23%), and 5 (n = 44; 18%). The mean age of participants was 8.30 years at T1 (SD = 1.45; range = 6 to 11 years), 9.17 years at T2 (SD = 1.42; range = 7 to 12 years), and 10.27 years at T3 (SD = 1.33; range = 8 to 13 years).

According to the T. J. Cole, Bellizzi, Flegal, and Dietz (2000) international age- and gender-specific body mass index (BMI) cutoffs, the majority of children (85%) were classified within the healthy-weight range at T1. A further 13% were within the overweight range and 2% were classified as obese. These classifications remained fairly stable over the study period. These figures are below the Australian national average of 25% for overweight and obesity in children (Australian Bureau of Statistics, 2013). Possible reasons for, and implications of, this discrepancy are discussed in Section 4.5.1.
On average, 9.76 months ($SD = 0.88$ months) elapsed between T1 and T2, and 23.05 months ($SD = 2.15$ months) elapsed between T1 and T3. Two hundred and nineteen participants (94 boys, 125 girls), representing 87% of the original sample, were successfully followed up at T3. Attrition over time was mainly the result of absence from school on the day of data collection or the participant leaving the school. T1 scores of participants who were successfully followed up were compared with the scores of those who were not followed up to test for any systematic bias that may have been introduced through attrition. Attrition analyses indicated that the two groups did not significantly differ on any variable.
Figure 1. Summary of recruitment procedures and response rate throughout the recruitment and interview process.

4.3.3. Measures. As described in Chapter 3 (Section 3.3.3), the assessment of body image in children poses more difficulties than it does in adults because of the greater distractibility of children and the difficulties they may have understanding some of the questions (Ricciardelli & McCabe, 2001a). Measures were therefore carefully
selected to ensure they did not require any sophisticated verbal ability, and response options were made as simple as possible with Don’t know or Not sure responses used where applicable.

4.3.3.1. Weight and height. Participants were weighed and measured as per the protocol outlined in Chapter 3 (Section 3.3.3.1), and their BMI calculated. Age- and gender-specific BMI z-scores were calculated using the Center for Disease Control 2000 reference data (Ogden et al., 2002). Weight status as a categorical variable was also calculated and defined using the T. J. Cole et al. (2000) international age- and gender-specific BMI cutoffs for categorising children as healthy-weight, overweight, or obese. Given the relatively small proportion of overweight and obese children in the present sample, these categories were collapsed.

4.3.3.2. Self-objectification. The Modified Self-Objectification Questionnaire (SOQ) was used as a measure of self-objectification in the present study. The SOQ measures the extent to which individuals view their bodies in observable, appearance-based terms as opposed to nonobservable, competence-based terms. This measure has been described in detail in Chapter 3 (Section 3.3.3.3).

4.3.3.3. Body dissatisfaction. Body dissatisfaction was measured using the Children’s Body Image Scale (CBIS; Truby & Paxton, 2002), which calculates the discrepancy between respondents’ perceived body size and their ideal body size. This discrepancy is considered one of the best measures of body dissatisfaction in children (R. M. Gardner, Friedman, & Jackson, 1999). The CBIS was developed using photographs of Australian children of varying BMI and consists of seven figures ranging from the 3rd to the 97th BMI percentile for 10-year-old children. Each individual figure corresponds to a specific BMI range and separate scales are provided for boys and girls. Participants in the present study were asked to select the figures that best represent their perceived and ideal body shapes. Participants were also asked to indicate
which figure they believe is best for children of the same age and sex to look. Body
dissatisfaction was calculated as the difference between perceived and ideal figure
ratings, with possible dissatisfaction scores ranging from -6 to +6. A score of zero
indicates body satisfaction, a negative score indicates body dissatisfaction in the
direction of desiring a larger figure (i.e., dissatisfaction due to being too small), and a
positive score indicates body dissatisfaction in the direction of desiring a thinner figure
(i.e., dissatisfaction due to being too large).

Perceptual body image, that is body distortion, was also assessed using the
CBIS. Participants were matched to a CBIS figure on the basis of their BMI. The
difference between this figure and participants’ self-selected perceived figure provided
an index of body distortion, where negative scores represented underestimation of body
size and positive scores represented overestimation of body size. The CBIS was chosen
for the present study because it has been validated for use with Australian children
between the ages of 7 and 12 years (Truby & Paxton, 2002, 2008).

4.3.3.4. Body surveillance and body shame. Body surveillance and body shame
were measured using the 4-item Body Surveillance subscale and the 5-item Body
Shame subscale of the Modified Objectified Body Consciousness Scale for Youth
(OBC-Y). These subscales have been described in detail in Chapter 3 (Section 3.3.3.2).
Given body image disturbance is comprised of both cognitive and affective components,
in assessing body shame (affective body dissatisfaction) in addition to perceived body
shape/ideal body shape discrepancy (cognitive body dissatisfaction), the present study
was able to obtain a measure of both these components.

Although the psychometric properties of these subscales were examined in detail
in Study 1, given the questionable internal consistency of the Body Shame subscale in
boys, internal consistency was reexamined in the present study. Both subscales were
internally consistent in this sample (ordinal coefficient alpha = .77 for the Body
Surveillance subscale and .77 for the Body Shame subscale). Both subscales were also internally consistent in boys (ordinal coefficient alpha = .85 for the Body Surveillance subscale and .83 for the Body Shame subscale) and in girls (ordinal coefficient alpha = .74 for the Body Surveillance subscale and .74 for the Body Shame subscale).

**4.3.3.5. Eating disorder symptoms.** Eating disorder symptoms were measured using the Children's Eating Disorder Examination (ChEDE; Bryant-Waugh et al., 1996). This comprehensive, semistructured clinical interview is designed to assess the full range of eating disorder symptomatology, behaviours, and attitudes in young children. The ChEDE is adapted from the widely used Eating Disorder Examination (Fairburn & Cooper, 1993), considered the gold standard for assessing eating disorder cognitions and behaviours (Guest, 2000). The child version has been modified by Bryant-Waugh et al. (1996) to assess the intent associated with disordered eating behaviours as well as the behaviour itself. Modifications include the simplification of language for use in children, the use of a practical sorting task to assess overevaluation of weight and shape, and an increased emphasis at the beginning of the interview on the time frame to which the questions refer. The original subscale structure is retained, with individual items averaged to generate the four subscales of Restraint (a measure of an individual’s conscious efforts to limit food intake), Eating Concern (a measure of preoccupation with food and eating), Shape Concern (a measure of dissatisfaction or preoccupation with body shape), and Weight Concern (a measure of dissatisfaction or preoccupation with weight). The ChEDE also contains a number of items that assess the diagnostic features of eating disorders, such as self-induced vomiting, excessive exercise, laxative and diuretic misuse, and binge eating. Questions related to laxative and diuretic misuse were not asked of participants as they were not deemed to be appropriate for this age group.
Subscale items of the ChEDE are rated by the interviewer on a 7-point, forced-choice scale ranging from 0 (no restraint/concern) to 6 (restraint present everyday/extreme concern), thus higher scores indicate greater severity or frequency of eating disorder symptoms. Scores on items assessing diagnostic features reflect the number of episodes of the diagnostic behaviour of interest reported over the previous month. Alpha coefficients for scores on the four subscales of the ChEDE in the present sample were .64 for Restraint, .34 for Eating Concern, .86 for Shape Concern, and .73 for Weight Concern. Alpha for the Global scale (calculated by averaging the four subscales of Restraint, Eating Concern, Shape Concern, and Weight Concern) was .89. These coefficients are similar to those reported by S. M. Byrne, Allen, Lampard, Dove, and Fursland (2010) in their community-based sample women.

**4.3.3.6. Other measures.** In addition to the measures described, participants completed the short-form Children’s Depression Inventory (CDI; Kovacs, 1985), the Multidimensional Media Influence Scale (MMIS; Cusumano & Thompson, 1997), the Self-Concept Inventory of the Beck Youth Inventory (BYI; J. S. Beck, Beck, & Jolly, 2001), and a Media Exposure Scale (MES), specifically designed for this thesis. These measures, although not relevant to the present study, are relevant to other studies arising from this thesis and are therefore described in more detail in later chapters.

**4.3.4. Procedure.** Participants were individually interviewed by either the candidate or a research assistant (thoroughly trained in the administration of the ChEDE and other assessment protocols) in a private room during a regular school day. Each interview took approximately 30 to 40 minutes. To place participants at ease, the interviewers introduced themselves and engaged in a positive conversation with each participant. The study was then introduced within the context of children helping the interviewers by providing their views and opinions, as this has been found to improve involvement and motivation (Goldman & Goldman, 1982). Participants were weighed
and measured, then verbally administered the CBIS, OBC-Y, BYI Self-Concept Inventory, SOQ, MMIS, ChEDE, CDI, and MES. Approximately half the participants were administered the battery in reverse order with order allocation randomised. Each questionnaire item and the possible responses were read aloud to participants and clarification was provided where needed. Practice items were provided for the OBC-Y, BYI, and SOQ to ensure participants understood the format in which each questionnaire was to be administered. Throughout test administration, several prompts were given to remind participants that there were no right or wrong answers and they should answer as honestly as possible. Following test administration, each participant was given a small reward (a sticker) for their participation and escorted back to class.

The measures and procedure outlined in this section were followed at T2 and T3. Although time consuming and costly, the collection of information from participants in the form of individual face–to–face interviews was important for a variety of reasons. These reasons were described in detail in Chapter 3 (Section 3.3.4) and are therefore reviewed only briefly here. First, the assessment procedure needed to be a standardised procedure suitable for all children in the present study. Given the age of the youngest participants, written responses could not be used as this required writing and reading skills beyond the capacity of 6-year-olds and less capable older children (Goldman & Goldman, 1982). Second, with verbal administration, the probability that participants fully understood the questions being asked and the format of responses required was increased. Third, individual administration provided complete privacy during weighing and measuring. Finally, the interview format allowed for the establishment of rapport, which has been found to increase motivation and cooperation with the interview process (Goldman & Goldman, 1982).

4.3.5. Statistical analysis. Factorial ANOVAs were conducted to examine the main effects of gender and weight category on the dependent variables of interest.
Paired samples $t$-tests were used to compare within-group differences. Pearson chi-square tests were used to examine differences in the observed proportions of the variables of interest across the two genders and across the two weight categories. Where necessary, significance was tested using a Bonferroni-adjusted significance level to control for the familywise error rate. These analyses were all conducted in SPSS. Given the number of analyses conducted, baseline (T1) results are reported in greater detail, with results from T2 and T3 presented in lesser detail for the sake of brevity.

To examine change over time in the constructs of interest, latent growth modelling (LGM) was implemented in Mplus 6.0 (L. K. Muthén & Muthén, 2010). LGM is considered one of the most powerful and informative approaches to the analysis of longitudinal data, allowing researchers to test for differences in developmental trajectories across time (B. M. Byrne, 2012). Time is parameterised via factor loadings that relate the repeated measures of the variables of interest to latent factors that represent the intercept (initial status) and slope (linear change). The intercept parameter represents a participant’s score on the outcome variable of interest at T1. The slope parameter represents rate of change over the time period of interest. Within the context of the present data, the slope represented the rate of change in the constructs of interest over the course of a 2-year period.

Given that only change over time was of interest to the present study, growth over time models were created for the variables of self-objectification, body distortion, body dissatisfaction, body surveillance, body shame, and ChEDE global score. Each growth model comprised three observed variables, with each of these variables being a subscale score of the variable under investigation at one of the three assessment points. The values of 0, 1, and 2 were assigned to the slope regression paths and represented T1, T2, and T3 respectively. As is customary in LGM, the intercept regression paths were fixed to 1 (Duncan & Duncan, 2009).
As the observed variables were continuous, all models were estimated using the maximum likelihood estimator. Fit was evaluated using the fit criteria outlined in Chapter 3 (Section 3.3.5.1). Given the use of the ML estimator, the Standardised Root Mean Square Residual (SRMR) was provided by Mplus instead of the Weighted Root Mean Square Residual. A value < .08 is indicative of adequate fit for the SRMR (Hu & Bentler, 1999). It is important to note that, due to their highly constrained nature, it is common for LGMs to fit the data poorly, even in situations where individual growth curves are approximated well (Preacher, Wichman, MacCallum, & Briggs, 2008). As such, although global fit criteria are presented in this study, the results focused predominantly on the individual parameters (i.e., the slopes) of the models as these were the findings that were of particular interest.

4.4. Results

4.4.1. Data suitability. Prior to analysis, the data were examined for outliers and to ensure the assumption of normality was met. Using Mahalanobis distance to detect multivariate outliers, and a criterion of ±3.29 standard deviations from the mean to detect univariate outliers, two multivariate and eight univariate outliers were detected. However, as discussed by Hair et al. (2010, p. 67), outliers must be viewed within the context of the analysis and should be evaluated by the types of information they may provide. They recommend that outliers be retained “unless demonstrable proof indicates that they are truly aberrant and not representative of any observations in the population.” Given the outliers found were for those individuals who scored highly on the constructs of interest, and this study was particularly interested in those individuals, outliers were not removed.

Scores on the ChEDE Global scale were not normally distributed (skewness > 2, kurtosis > 4). These scores were transformed using a square root transformation. Skewness and kurtosis significantly improved (skewness < 2, kurtosis < 4).
Finally, for LGM to be implemented, data must be obtained for each individual on three or more occasions, and minimum sample sizes of not less than 200 at each time point must be obtained. Both conditions were met in the present study.

4.4.2. Descriptive information and preliminary analyses. Prior to analysis, gender differences in body mass were evaluated. Mean BMI $z$-scores for the overall sample, for boys and girls, and for healthy-weight and overweight/obese children are presented in Table 1. An independent samples $t$-test indicated that boys and girls did not differ significantly with respect to BMI $z$-score, $t(245) = -1.60, p = .111, d = -0.21$. The prevalence of overweight and obesity also did not significantly differ between boys and girls, $\chi^2(247) = 1.39, p = .239, \Phi = .08$, with 12.3% of boys and 17.7% of girls categorised as overweight or obese. Actual CBIS category (i.e., CBIS figure) was found to differ, however, with girls belonging to a significantly higher CBIS category than boys, $t(245) = 4.68, p < .001, d = 0.61$. This may be because, as noted by Truby and Paxton (2002), the CBIS figures for girls represent slightly different BMI ranges than the CBIS figures for boys due to the normal sex variation in BMI distribution in young children. For example, the first figure of the CBIS scale for girls represents a BMI range of 13.0 to 13.5, whereas the first figure of the CBIS scale for boys represents a BMI range of 14.0 to 14.6. As such, Truby and Paxton (2002) recommended that caution be exercised when comparing the responses of girls and boys directly. Mean CBIS actual figures are presented in Table 1.
Table 1

**Means (and Standard Deviations) of BMI z-score and CBIS Figure**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender diff.</th>
<th>Weight category</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>BMI z-score</td>
<td>T1</td>
<td>0.32 (0.94)</td>
<td>0.22 (0.86)</td>
<td>0.41 (0.99)</td>
<td>0.02 (0.55)</td>
<td>2.00 (0.85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 247</td>
<td>n = 106</td>
<td>n = 141</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.22 (0.95)</td>
<td>0.14 (0.89)</td>
<td>0.28 (0.99)</td>
<td>-0.09 (0.57)</td>
<td>1.88 (0.84)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 229</td>
<td>n = 99</td>
<td>n = 130</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.25 (0.90)</td>
<td>0.21 (0.88)</td>
<td>0.28 (0.91)</td>
<td>-0.03 (0.61)</td>
<td>1.71 (0.75)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 219</td>
<td>n = 94</td>
<td>n = 125</td>
<td></td>
</tr>
<tr>
<td>CBIS figure</td>
<td>T1</td>
<td>3.45 (1.38)</td>
<td>3.00 (1.25)</td>
<td>3.79 (1.37)</td>
<td>3.09 (1.13)</td>
<td>5.45 (0.80)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>3.47 (1.45)</td>
<td>3.05 (1.33)</td>
<td>3.79 (1.46)</td>
<td>3.09 (1.22)</td>
<td>5.43 (0.80)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>3.91 (1.42)</td>
<td>3.51 (1.27)</td>
<td>4.21 (1.46)</td>
<td>3.59 (1.29)</td>
<td>5.57 (0.78)</td>
</tr>
</tbody>
</table>

*Note.* The per-cell sample sizes noted for BMI z-score are also the per-cell sample sizes for CBIS figure. Ov/Ob = Overweight/Obese

As weight category was stable across time, descriptive statistics are presented at all three time points, but with T1 weight category used to categorise participants as healthy-weight or overweight/obese.
4.4.3. Self-objectification.

4.4.3.1. Comparison of means. As there are no published cutoffs for what is considered a significant level of self-objectification, T1 self-objectification scores obtained by boys and girls in the present study were compared to self-objectification scores obtained in studies of older samples. Means and 95% confidence intervals for all studies that assessed self-objectification using the SOQ were calculated (Calogero, 2009; Calogero et al., 2005; Morry & Staska, 2001; Myers & Crowther, 2007; Slater & Tiggemann, 2002; Tiggemann & Kuring, 2004; Tiggemann & Lynch, 2001; Tiggemann & Williams, 2012). Figure 2 presents these means and confidence intervals for females. Figure 3 presents these means and confidence intervals for males.

As shown in Figure 2, there is a considerable degree of overlap between self-objectification scores obtained by girls in the present sample and those obtained by adult and adolescent samples. As expected, self-objectification in the present sample of community-based girls differed significantly from a clinical sample of females with eating disorders.
Figure 2. Means and 95% confidence intervals of self-objectification obtained by females in the present study and in various comparison studies. Self-objectification scores range from -25 to +25, with higher scores indicative of greater self-objectification.

Given the limited number of studies examining self-objectification in males, only three comparisons could be made, all to undergraduates. As shown in Figure 3, there is no overlap between self-objectification scores obtained by boys in the present study and self-objectification scores obtained by undergraduates in comparison studies.
4.4.3.2. Gender and weight category differences. Mean self-objectification scores (with standard deviations) for boys and girls and healthy-weight and overweight/obese children at all three assessment points are presented in Table 2. A series of 2 (gender) × 2 (weight category) between-group ANOVAs revealed that neither the main effects of gender and weight category, nor the interaction between gender and weight category, were significant at any assessment point.
## Table 2

**Means (and Standard Deviations) of Self-Objectification**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender diff.</th>
<th>Weight category&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>Self-objectification</td>
<td>T1</td>
<td>-12.60 (8.89)</td>
<td>-13.28 (8.51)</td>
<td>-12.08 (9.17)</td>
<td>-12.80 (9.10)</td>
<td>-11.47 (7.65)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>-14.22 (8.89)</td>
<td>-14.78 (8.51)</td>
<td>-13.80 (9.17)</td>
<td>-14.40 (8.97)</td>
<td>-13.32 (8.51)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>-15.49 (8.83)</td>
<td>-16.25 (8.11)</td>
<td>-14.92 (9.31)</td>
<td>-15.49 (8.97)</td>
<td>-15.47 (8.12)</td>
</tr>
</tbody>
</table>

<sup>a</sup>As weight category was stable across time, descriptive statistics are presented at all three time points, but with T1 weight category used to categorise participants as healthy-weight or overweight/obese.
4.4.4. **Body distortion.** To examine body distortion, the difference between actual CBIS figure and perceived CBIS figure was examined cross-sectionally at T1. Means and standard deviations for these scores are presented in Table 3. Using a Bonferroni-adjusted significance level of .01 to control for the familywise error rate, children were found to significantly underestimate their CBIS figure, $t(245) = -8.10$, $p < .001$, $d = -0.52$, that is, they thought they were thinner than they really were. This finding was observed in boys, $t(105) = -6.02$, $p < .001$, $d = -0.69$, girls, $t(139) = -5.50$, $p < .001$, $d = -0.47$, healthy-weight children, $t(207) = -5.62$, $p < .001$, $d = -0.44$, and overweight/obese children, $t(37) = -9.28$, $p < .001$, $d = -1.52$.

The percentage of children at T1 who overestimated, underestimated, and accurately estimated their figure is presented in Table 4 for descriptive purposes. In all subgroups, significantly more children underestimated than overestimated their figure ($p < .001$).

4.4.4.1. **Gender and weight category differences.** To compare the body size perceptions of boys and girls, healthy-weight and overweight/obese participants, a 2 (gender) × 2 (weight category) between-groups ANOVA was conducted on T1 body distortion scores. This analysis indicated a significant main effect of weight category, $F(1, 242) = 32.24$, $p < .001$, $\eta^2_{\text{partial}} = .12$, with overweight/obese children underestimating their actual size to a greater extent than healthy-weight children. There was no significant main effect of gender or significant gender × weight category interaction. This finding was replicated at T2 and T3.
Table 3

*Means (and Standard Deviations) of Figure Selection, Body Shame, and Body Surveillance*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender</th>
<th>Weight category</th>
<th>Weight category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>Perceived figure</td>
<td>T1</td>
<td>2.78 (1.22)</td>
<td>2.24 (0.94)</td>
<td>3.19 (1.25)</td>
<td>2.60 (1.09)</td>
<td>3.74 (1.45)</td>
</tr>
<tr>
<td></td>
<td>n=247</td>
<td>n=106</td>
<td>n=141</td>
<td></td>
<td>n=209</td>
<td>n=38</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>2.93 (1.20)</td>
<td>2.36 (0.87)</td>
<td>3.37 (1.23)</td>
<td>2.71 (1.01)</td>
<td>4.11 (1.43)</td>
</tr>
<tr>
<td></td>
<td>n=229</td>
<td>n=99</td>
<td>n=130</td>
<td></td>
<td>n=192</td>
<td>n=37</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>3.00 (1.08)</td>
<td>2.43 (0.83)</td>
<td>3.42 (1.06)</td>
<td>2.82 (0.92)</td>
<td>3.97 (1.36)</td>
</tr>
<tr>
<td></td>
<td>n=219</td>
<td>n=94</td>
<td>n=125</td>
<td></td>
<td>n=184</td>
<td>n=35</td>
</tr>
<tr>
<td>Ideal figure</td>
<td>T1</td>
<td>2.16 (0.96)</td>
<td>1.92 (0.92)</td>
<td>2.35 (0.95)</td>
<td>2.12 (0.93)</td>
<td>2.37 (1.10)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>2.35 (0.95)</td>
<td>1.98 (0.73)</td>
<td>2.62 (1.00)</td>
<td>2.28 (0.89)</td>
<td>2.72 (1.16)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>2.55 (0.98)</td>
<td>2.19 (0.82)</td>
<td>2.81 (1.01)</td>
<td>2.43 (0.87)</td>
<td>3.18 (1.27)</td>
</tr>
<tr>
<td>Ideal figure for sex and age</td>
<td>T1</td>
<td>2.47 (1.06)</td>
<td>2.25 (0.97)</td>
<td>2.64 (1.09)</td>
<td>2.43 (1.07)</td>
<td>2.71 (0.98)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p=.003</td>
<td></td>
<td></td>
<td>p=.130</td>
<td></td>
</tr>
<tr>
<td>Body distortion</td>
<td>T1</td>
<td>-0.68 (1.31)</td>
<td>-0.76 (1.31)</td>
<td>-0.61 (1.32)</td>
<td>-0.49 (1.26)</td>
<td>-1.71 (1.14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p=.377</td>
<td></td>
<td></td>
<td>p=.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>-0.53 (1.25)</td>
<td>-0.67 (1.26)</td>
<td>-0.42 (1.23)</td>
<td>-0.38 (1.20)</td>
<td>-1.33 (1.20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p=.134</td>
<td></td>
<td></td>
<td>p=.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>-0.91 (1.30)</td>
<td>-1.07 (1.34)</td>
<td>-0.79 (1.27)</td>
<td>-0.78 (1.27)</td>
<td>-1.62 (1.26)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p=.127</td>
<td></td>
<td></td>
<td>p=.001</td>
<td></td>
</tr>
</tbody>
</table>

*Continued below*
Table 3 continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender diff.</th>
<th>Weight category(^a)</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>T1</td>
<td>0.61 (1.20)</td>
<td>0.32 (1.07)</td>
<td>0.83 (1.25)</td>
<td>0.47 (1.15)</td>
<td>1.37 (1.22)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.59 (0.93)</td>
<td>0.38 (0.75)</td>
<td>0.75 (1.02)</td>
<td>0.44 (0.81)</td>
<td>1.39 (1.13)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.45 (0.84)</td>
<td>0.24 (0.65)</td>
<td>0.61 (0.92)</td>
<td>0.39 (0.82)</td>
<td>0.79 (0.84)</td>
</tr>
<tr>
<td>Ideal fig. for sex and age − ideal fig.</td>
<td>T1</td>
<td>0.31 (1.01)</td>
<td>0.33 (1.03)</td>
<td>0.29 (1.00)</td>
<td>0.30 (1.03)</td>
<td>0.34 (0.91)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.29 (0.82)</td>
<td>0.34 (0.84)</td>
<td>0.25 (0.80)</td>
<td>0.29 (0.78)</td>
<td>0.26 (1.01)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.27 (0.71)</td>
<td>0.29 (0.70)</td>
<td>0.25 (0.71)</td>
<td>0.34 (0.68)</td>
<td>-0.15 (0.74)</td>
</tr>
<tr>
<td>Body surveillance</td>
<td>T1</td>
<td>2.80 (2.30)</td>
<td>2.77 (2.17)</td>
<td>2.83 (2.47)</td>
<td>2.69 (2.35)</td>
<td>3.35 (1.89)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.88 (1.94)</td>
<td>1.64 (1.79)</td>
<td>2.05 (2.03)</td>
<td>1.84 (1.92)</td>
<td>2.08 (2.00)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.61 (1.85)</td>
<td>1.29 (1.68)</td>
<td>1.84 (1.94)</td>
<td>1.56 (1.80)</td>
<td>1.85 (2.09)</td>
</tr>
<tr>
<td>Body shame</td>
<td>T1</td>
<td>2.85 (2.51)</td>
<td>2.85 (2.33)</td>
<td>2.85 (2.73)</td>
<td>2.58 (2.41)</td>
<td>4.31 (2.53)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.98 (2.16)</td>
<td>1.75 (2.03)</td>
<td>2.15 (2.24)</td>
<td>1.81 (2.03)</td>
<td>2.89 (2.71)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.71 (2.06)</td>
<td>1.45 (1.93)</td>
<td>1.90 (2.15)</td>
<td>1.64 (2.01)</td>
<td>2.09 (2.33)</td>
</tr>
</tbody>
</table>

Note. The per-cell sample sizes noted for perceived figure are also the per-cell sample sizes for all other variables presented in this table.

Ov/Ob = Overweight/Obese

\(^a\)As weight category was stable across time, descriptive statistics are presented at all three time points, but with T1 weight category used to categorise participants as healthy-weight or overweight/obese.
4.4.5. **Body dissatisfaction.** As described, body dissatisfaction was assessed using figure preference ratings. Mean figure selection scores and mean body dissatisfaction scores are presented in Table 3. The prevalence of reported body dissatisfaction in the overall sample and across all subgroups was examined cross-sectionally at T1 and is presented in Table 4. The prevalence of body dissatisfaction among all children was marked, with over 50% desiring a figure thinner than their perceived figure. Over a third desired a figure thinner than what they considered to be ideal for their sex and age. The proportion of children desiring a thinner figure was significantly greater than the proportion of children desiring a larger figure, $\chi^2(1) = 51.61, p < .001$, or those desiring to remain the same as their perceived figure, $\chi^2(1) = 10.57, p = .001$.

4.4.5.1. **Within-group differences.** As it has been suggested that obtaining average ratings for body dissatisfaction may mask the direction of desired body changes (with those selecting heavier figures and those selecting thinner figures essentially cancelling each other out; Vartanian, 2012), paired samples $t$-tests of T1 data were conducted to determine if there was a significant difference between mean perceived figure and mean ideal figure in the overall sample and in each of the subsamples. Using an adjusted significance level of .01 to control for the familywise error rate, a significant difference was found in the overall sample, $t(244) = 7.95, p < .001, d = 0.35$, in boys, $t(105) = 3.08, p = .003, d = 0.56$, in girls, $t(138) = 7.84, p < .001, d = 0.76$, in healthy-weight participants, $t(206) = 5.91, p < .001, d = 0.47$, and in overweight/obese participants, $t(37) = 6.93, p < .001, d = 1.07$. In all instances, ideal figure was significantly thinner than perceived figure.

Paired samples $t$-tests of T1 data were also conducted to determine if there was a significant difference between the figure selected to indicate ideal figure and the figure selected to indicate perceived ideal figure for children of the same sex and age. Using a
Bonferroni-adjusted significance level of .01, a significant difference was found in the overall sample, $t(244) = -4.73, p < .001, d = -0.30$, in boys, $t(105) = -3.30, p = .001, d = -0.35$, in girls, $t(138) = -3.39, p < .001, d = -0.28$, and in healthy-weight participants, $t(206) = -4.18, p < .001, d = -0.30$. In overweight/obese participants, a trend towards significance was noted, $t(37) = -2.32, p = .026, d = -0.33$. In all instances, ideal figure was significantly thinner than perceived ideal figure for sex and age.

### 4.4.5.2. Gender and weight category differences.

A series of 2 (gender) × 2 (weight category) between-group ANOVAs revealed that at T1, a significant main effect of gender, $F(1, 241) = 9.55, p < .001, \eta^2_{\text{partial}} = .04$, and weight category, $F(1, 241) = 13.40, p < .001, \eta^2_{\text{partial}} = .05$, was found with girls and overweight/obese participants reporting greater body dissatisfaction than boys and healthy-weight participants. Significant gender and weight category differences were also observed at T2 and T3 (see Table 3).

At T1, over 60% of girls and over 40% of boys desired a figure thinner than their perceived figure. A 2 (gender) × 3 (body dissatisfaction) Pearson chi-square analysis revealed an association between gender and body dissatisfaction, $\chi^2(2) = 10.53, p = .005, \text{Cramér's } V = .21$. Post hoc analyses conducted using adjusted standardised residuals and a Bonferroni-adjusted significance level of .017 revealed that a disproportionately larger percentage of girls than boys desired a figure thinner than their perceived figure, $\chi^2(1) = 10.24, p = .001$. Almost 50% of healthy-weight children and over 80% of overweight/obese children desired a figure thinner than their perceived figure. A 2 (weight category) × 3 (body dissatisfaction) Pearson chi-square analysis revealed an association between weight category and body dissatisfaction, $\chi^2(2) = 15.92, p < .001, \text{Cramér's } V = .26$. Post hoc analyses revealed that a disproportionately larger percentage of overweight/obese children compared to healthy-weight children desired a figure thinner than their perceived figure, $\chi^2(1) = 15.52, p < .001$. 
Table 4

Prevalence of Body Dissatisfaction and Body Distortion at T1 in the Overall Sample and Separated by Gender and Weight Category

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall n = 247</th>
<th>Gender diff.</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys n = 106</td>
<td>Girls n = 141</td>
<td>Healthy n = 209</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desire to be thinner&lt;sup&gt;a&lt;/sup&gt;</td>
<td>52.2</td>
<td>41.6</td>
<td>61.2</td>
</tr>
<tr>
<td>Desire to be larger&lt;sup&gt;a&lt;/sup&gt;</td>
<td>14.7</td>
<td>17.0</td>
<td>12.9</td>
</tr>
<tr>
<td>Desire to remain the same&lt;sup&gt;a&lt;/sup&gt;</td>
<td>33.1</td>
<td>42.5</td>
<td>25.9</td>
</tr>
<tr>
<td>Desire for a body thinner than they consider ideal for sex and age</td>
<td>37.1</td>
<td>42.5</td>
<td>33.1</td>
</tr>
<tr>
<td>Desire for a body larger than they consider ideal for sex and age</td>
<td>16.7</td>
<td>16.0</td>
<td>17.3</td>
</tr>
<tr>
<td>Desire for a body the same as they consider ideal for sex and age</td>
<td>46.1</td>
<td>41.5</td>
<td>49.6</td>
</tr>
<tr>
<td>Body estimation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate estimation</td>
<td>28.9</td>
<td>24.5</td>
<td>32.1</td>
</tr>
<tr>
<td>Overestimation</td>
<td>17.1</td>
<td>16.0</td>
<td>17.9</td>
</tr>
<tr>
<td>Underestimation</td>
<td>54.1</td>
<td>59.4</td>
<td>49.6</td>
</tr>
</tbody>
</table>

Note. Results are percentages. Ov/Ob = Overweight/Obese

<sup>a</sup>Relative to perceived figure

4.4.6.1. Gender and weight category differences. Means and standard deviations for body surveillance scores across subgroups are presented in Table 3. Gender differences in body surveillance were examined in detail in Study 1 (Chapter 3, Section 3.4.5). As such, these are not discussed here. Independent samples \( t \)-tests revealed no significant weight category difference at any assessment point.

4.4.7. Body shame.

4.4.7.1. Gender and weight category differences. Means and standard deviations for body shame scores across subgroups are presented in Table 3. As with body surveillance, gender differences were examined in detail in Study 1 (Chapter 3, Section 3.4.5) and are therefore not repeated here. Independent samples \( t \)-tests revealed a significant weight category difference at T1, \( t(245) = 4.03, p < .001, d = 0.70 \), with overweight/obese children reporting significantly higher body shame scores than healthy-weight children. A significant difference was also observed at T2, but not at T3.

To obtain a measure of affective body image disturbance, the proportion of children who endorsed the various items of the Body Shame subscale of the OBC-Y was examined at T1. Approximately 22% of children reported that they would be ashamed for people to know what they weigh, whilst 21% reported that they would feel ashamed if they are not the size they think they should be. Approximately 27% reported that they question whether they are a good person when they do not exercise enough, 8% reported feeling like a bad person when they do not look as good as they could, and 15% reported feeling ashamed of themselves when they haven’t made an effort to look their best. Note these percentages reflect those participants who responded with a yes on these items. A significant minority also responded sometimes, although the majority of participants responded no.
4.4.8. Eating disorder symptomatology. Mean scores (with standard deviations) for the ChEDE Global scale in the overall sample and calculated separately for boys and girls and healthy-weight and overweight/obese children are presented in Table 5. In the overall sample and across all subsamples, scores on the Global scale were low. A significant minority of participants did, however, score highly on this scale. This finding is examined in greater detail in Section 4.4.8.2 below.

4.4.8.1. Gender and weight category differences. A 2 (gender) × 2 (weight category) between-groups ANOVA was performed to test for the main effects of, or interaction between, gender and weight category on the global score of the ChEDE. A significant main effect of gender was found at T1, $F(1, 243) = 7.56, p = .006$, $\eta^2_{\text{partial}} = .03$, with a significantly higher global score observed in girls compared to boys. A significant main effect of weight category was also found at T1, $F(1, 243) = 26.51, p < .001$, $\eta^2_{\text{partial}} = .10$, with a significantly higher global score observed in those categorised as overweight/obese compared to those categorised as healthy-weight. These findings were replicated at T2 and T3.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender</th>
<th>Weight category&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>Global scale</td>
<td>T1</td>
<td>0.30 (0.49)</td>
<td>0.22 (0.34)</td>
<td>0.37 (0.57)</td>
<td>0.23 (0.36)</td>
<td>0.72 (0.83)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 247</td>
<td>n = 106</td>
<td>n = 141</td>
<td>n = 209</td>
<td>n = 38</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.30 (0.50)</td>
<td>0.21 (0.34)</td>
<td>0.36 (0.59)</td>
<td>0.21 (0.33)</td>
<td>0.78 (0.88)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 229</td>
<td>n = 99</td>
<td>n = 130</td>
<td>n = 192</td>
<td>n = 37</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.30 (0.53)</td>
<td>0.17 (0.27)</td>
<td>0.39 (0.65)</td>
<td>0.24 (0.41)</td>
<td>0.61 (0.89)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 219</td>
<td>n = 94</td>
<td>n = 125</td>
<td>n = 184</td>
<td>n = 35</td>
</tr>
</tbody>
</table>

<sup>a</sup>As weight category was stable across time, descriptive statistics are presented at all three time points, but with T1 weight category used to categorise participants as healthy-weight or overweight/obese.

<sup>Note</sup>. All values represent raw, nontransformed scores. Ov/Ob = Overweight/Obese.
4.4.8.2. Prevalence of eating disorder symptomatology. The proportion of children endorsing the various diagnostic items of the ChEDE (i.e., excessive exercise, objective binge eating, subjective binge eating, and objective overeating) at T1 is presented in Table 7. The prevalence of excessive exercise (i.e., driven and intense exercise for the purposes of losing weight or changing shape) was fairly low. Almost 20% (n = 7) of overweight/obese children engaged in subjective binge eating. There were no occurrences of self-induced vomiting. The fairly low proportion of individuals engaging in these behaviours precluded accurate analyses of differences in prevalence between boys and girls, and healthy-weight and overweight/obese children from being conducted. Overall, however, the prevalence of binge eating and excessive exercise was greater in girls than in boys. A greater proportion of overweight/obese participants than healthy-weight participants engaged in excessive exercise, objective binge eating, and subjective binge eating. Spontaneous reasons given by participants for wanting to lose weight included teasing by peers, pressure from family, wanting to look better, improving sporting ability, not liking their weight, and wanting to be healthier.

The proportion of children who scored more than 1 standard deviation above the mean of community-based norms of 12- to 15-year-olds on the ChEDE Global scale (i.e., > 1.09; Wade, Byrne, & Bryant-Waugh, 2008) is presented in Table 7. Over 7% of participants scored more than 1 standard deviation above the mean of community-based norms. Significantly more overweight/obese children than healthy-weight children scored more than 1 standard deviation above the mean. A significant gender difference was not observed.
Table 7

*Reported Eating Disorder Symptomatology at T1 in the Overall Sample and Separated by Gender and Weight Category*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender diff.</th>
<th>Weight category</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td></td>
<td>n = 247</td>
<td>n = 106</td>
<td>n = 141</td>
<td>n = 209</td>
<td>n = 38</td>
</tr>
<tr>
<td>Diagnostic items</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excessive exercise</td>
<td>2.4</td>
<td>0.9</td>
<td>3.5</td>
<td>1.9</td>
<td>5.3</td>
</tr>
<tr>
<td>Objective binge eating</td>
<td>4.0</td>
<td>2.8</td>
<td>5.0</td>
<td>2.9</td>
<td>10.5</td>
</tr>
<tr>
<td>Subjective binge eating</td>
<td>5.7</td>
<td>3.8</td>
<td>7.1</td>
<td>3.3</td>
<td>18.4</td>
</tr>
<tr>
<td>Objective overeating</td>
<td>2.8</td>
<td>1.9</td>
<td>3.5</td>
<td>3.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Global score &gt; +1SD</td>
<td>7.3</td>
<td>3.8</td>
<td>9.9</td>
<td>4.3</td>
<td>23.7</td>
</tr>
</tbody>
</table>

*Note.* Results are percentages. Ov/Ob = Overweight/Obese.
**4.4.9. Prospective analyses.** All variables were examined prospectively to examine any changes in self-objectification, body dissatisfaction, body distortion, body surveillance, body shame, and eating disorder symptomatology over time. For each variable, a latent growth curve was created.

The initial specification of a growth model for self-objectification resulted in a nonpositive definite error message as a result of negative variance on the slope factor. As this variance, and the covariance between the slope factor and intercept factor, was not significant, the variance of the slope factor was constrained to 0 as per the recommendations of B. O. Muthén (2007, November 15). With this specification, the growth over time model was an excellent fit to the data (see Table 8 for fit statistics). No modification indices were suggested. Examination of the parameter estimates revealed that self-objectification decreased significantly over the 2 years of the study \( (M = -1.42, SE = 0.34, p < .001) \). When both gender and weight category were included in this growth model as covariates, they did not significantly predict rate of change in self-objectification over time (gender: \( \beta = 0.35, p = .611 \); weight category: \( \beta = -0.79, p = .397 \)). Any differences in rate of change in self-objectification between boys and girls and healthy-weight and overweight/obese participants were thus negligible.

Similar results were obtained for body dissatisfaction. The growth over time model for body dissatisfaction was an excellent fit to the data (see Table 8), with no modification indices suggested. Body dissatisfaction decreased significantly over the 2 years of the study \( (M = -0.10, SE = 0.04, p = .021) \). Gender and weight category did not significantly predict change in body dissatisfaction over time (gender: \( \beta = -0.02, p = .848 \); weight category: \( \beta = -0.22, p = .053 \)).

The growth over time model for body distortion was not a good fit to the data (see Table 8). Several modification indices in the form of outcome variable intercepts, loadings for intercept and slope factors, and residual covariances for outcomes were
suggested. Although the implementation of residual covariances for outcomes is recommended as a modification to growth models (L. K. Muthén & Muthén, 2008), the model lacked sufficient degrees of freedom to implement these modifications. Body distortion, specifically the underestimation of body size, significantly increased over the 2 years of the study ($M = -0.15, SE = 0.05, p = .002$). Gender and weight category did not significantly predict change in body distortion over time (gender: $\beta = 0.03, p = .779$; weight category: $\beta = 0.18, p = .161$).

The growth over time model for body surveillance was not a good fit to the data (see Table 8); however, no modification indices were suggested. Body surveillance significantly decreased over the 2 years of the study ($M = -0.55, SE = 0.09, p < .001$). Although the model improved in fit when gender and weight category were included as covariates, $\chi^2(3) = 7.35, p = .062$, RMSEA = .08, RMSEA 90% CI [.00, .16], CFI = .96, TLI = .87, SRMR = .03, these variables did not significantly predict change in body surveillance over time (gender: $\beta = 0.21, p = .206$; weight category: $\beta = -0.13, p = .568$).

The growth over time model for body shame provided an inconsistent fit to the data (see Table 8). Body shame significantly decreased over the 2 years of the study ($M = -0.54, SE = 0.09, p < .001$). As with body surveillance, the model improved in fit when gender and weight category were included as covariates, $\chi^2(3) = 5.87, p = .118$, RMSEA = .07, RMSEA 90% CI [.00, .15], CFI = .98, TLI = .93, SRMR = .03. While gender did not significantly predict change in body shame over time ($\beta = 0.18, p = .304$), weight category did ($\beta = -0.60, p = .010$), with body shame scores from overweight/obese children decreasing at a faster rate than scores from healthy-weight children.

Finally, the growth over time model for the ChEDE Global scale was tested. This model was an excellent fit to the data (see Table 8). Examination of the parameter estimates revealed that scores on the Global scale did not significantly change over the 2
years of the study ($M = -0.01, SE = 0.01, p = .709$). Gender and weight category did not significantly predict change in scores over time (gender: $\beta = 0.03, p = .329$; weight category: $\beta = -0.04, p = .287$).

Table 8

*Fit Indices for the Latent Growth Models Examining Change in the Variables of Interest Over Time*

<table>
<thead>
<tr>
<th>Growth model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$ value</th>
<th>RMSEA</th>
<th>RMSEA 90% CI</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-objectification</td>
<td>1.08</td>
<td>3</td>
<td>.783</td>
<td>.00</td>
<td>[.00, .08]</td>
<td>1.00</td>
<td>1.00</td>
<td>.02</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>0.42</td>
<td>1</td>
<td>.518</td>
<td>.00</td>
<td>[.00, .15]</td>
<td>1.00</td>
<td>1.00</td>
<td>.01</td>
</tr>
<tr>
<td>Body distortion</td>
<td>14.13</td>
<td>1</td>
<td>&lt;.001</td>
<td>.25</td>
<td>[.14, .37]</td>
<td>.94</td>
<td>.81</td>
<td>.05</td>
</tr>
<tr>
<td>Body surveillance</td>
<td>6.80</td>
<td>1</td>
<td>.009</td>
<td>.16</td>
<td>[.07, .29]</td>
<td>.94</td>
<td>.82</td>
<td>.04</td>
</tr>
<tr>
<td>Body shame</td>
<td>5.46</td>
<td>1</td>
<td>.020</td>
<td>.14</td>
<td>[.05, .27]</td>
<td>.96</td>
<td>.87</td>
<td>.04</td>
</tr>
<tr>
<td>ChEDE Global</td>
<td>0.00</td>
<td>1</td>
<td>.992</td>
<td>.00</td>
<td>[.00, .00]</td>
<td>1.00</td>
<td>1.00</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standardised Root Mean Square Residual.

4.5. Discussion

The present study aimed to extend previous research by utilising both a cross-sectional and prospective design to examine overall levels of self-objectification, body image disturbance, and eating disorder symptoms in Australian boys and girls. A secondary aim of the study was to examine gender and weight category differences in body image disturbance and eating disorder symptoms. The key findings will be discussed here.

Perhaps the most important finding from the present study was the considerable degree of overlap between self-objectification scores obtained by girls in the present sample and those obtained by adolescents and adults in previous investigations of self-
objectification. Specifically, girls in the present study reported levels of self-objectification that significantly overlapped with levels of self-objectification reported by 20- to 84-year-old women (Tiggemann & Lynch, 2001) and 12- to 16-year-old adolescents (Slater & Tiggemann, 2002). This finding suggests that the degree to which young girls self-objectify is similar to the degree to which older females self-objectify. This supports the proposition that young girls, like adults, are vulnerable to the messages of objectification that permeate Western societies and suggests that an investigation of the consequences of self-objectification in this population is warranted.

Self-objectification scores obtained by boys in the present study did not overlap with scores obtained by older males; however, the paucity of research on self-objectification in males precluded multiple comparisons from being conducted. Additionally, although objectification theory was initially proposed as a framework for understanding females’ experiences with objectification, this study found that, consistent with the findings of Study 1 (Chapter 3), gender did not influence self-objectification, suggesting that boys can also experience self-objectification. Although this finding stands in contrast to the majority of studies examining self-objectification in males and females (e.g., Aubrey, 2006; Calogero, 2009; Tiggemann & Kuring, 2004), it is consistent with research by Morry and Staska (2001) that did not find a gender difference in self-objectification in a sample of undergraduates.

Self-objectification scores in the present study were not influenced by weight category, suggesting that both healthy-weight and overweight/obese children can experience self-objectification. This finding is consistent with objectification theory, which states that self-objectification can affect all individuals regardless of weight status (Calogero et al., 2005; Fredrickson & Roberts, 1997; Fredrickson et al., 1998; Myers & Crowther, 2007; Tiggemann & Lynch, 2001), and suggests that the treatment
of the self as an object to be evaluated can affect males and females, children and adults, healthy-weight and overweight individuals.

Another key finding to emerge from the present study is the significant proportion of 6- to 11-year-olds who selected an ideal body shape that was thinner than both the figure selected to represent perceived body shape, and the figure selected to represent perceived ideal body shape for peers of the same sex and age. This finding was supported in both boys and girls and is consistent with previous research on body dissatisfaction in children (e.g., Berger et al., 2005; Clark & Tiggemann, 2008; M. E. Collins, 1991; Davison et al., 2003; Dohnt & Tiggemann, 2006; Maloney, McGuire, Daniels, & Specker, 1989; McVey, Tweed, et al., 2004; Olvera et al., 2005; Ricciardelli et al., 2003; Rolland et al., 1997; Schur et al., 2000; Wood et al., 1996).

It is important to note here the suggestion made by Lowes and Tiggemann (2003), and reiterated by Dohnt and Tiggemann (2006), that although many children desire a thinner figure, this desire may not necessarily equate qualitatively to the affective experience of body dissatisfaction reported by older populations. Indeed, although the correlation between body dissatisfaction and body shame in the present study was significant \( r = .16, p = .015 \), the correlation itself is small. In assessing for body shame in addition to body dissatisfaction, however, this study obtained a measure of the affective experience of body image disturbance. On examination of body shame, the present study found that just under a quarter of participants reported that they would feel ashamed if they are not the size they think they should be. Just under a quarter of participants also reported that they would be ashamed for others to know how much they weigh. This suggests that perhaps children do experience the affective component of body dissatisfaction. Furthermore, as noted by Dohnt and Tiggemann (2006), the fact that many children prefer a figure thinner than their own indicates, at the very least, the
existence of a cognitive bias that may underlie the subsequent development of affective body dissatisfaction, weight and shape concerns, and disordered eating.

In support of the gender differences inherent in body image research, girls reported significantly greater body dissatisfaction than boys. However, although significantly more girls than boys desired a figure thinner than their perceived figure, a substantial proportion of boys also selected a thinner ideal figure. Indeed, significantly more boys desired a thinner figure than a larger figure. This finding stands in contrast to previous research that has found preadolescent boys desire a larger body size (Jung & Peterson, 2007), or an equal number of boys desire a larger figure as desire a thinner one (Lowes & Tiggemann, 2003). The present study therefore supports the recommendation of Jones et al. (2008) that a singular focus on muscularity in boys could distort the importance of this one aspect of body image in this population, leading to an inadequate exploration and understanding of other important factors in males, such as weight concerns. As such, it appears that body image in boys should focus on weight and shape concerns in addition to muscularity.

With respect to girls, the finding that 26% said they wanted to remain at their perceived current figure and 61% said they wanted to be thinner than their perceived current figure is of particular interest when considering that some of the girls in this study were approaching adolescence and will soon be experiencing the increase in weight gain and body fat that comes with normal growth and development, but that will move them further away from their ideal figure. These girls may be particularly at risk of experiencing further increases in body image disturbance when these body changes occur. The knowledge they have acquired about weight, exercise, and dieting may then come into practice, with some girls implementing various weight-loss methods to achieve body satisfaction.
Consistent with previous studies (e.g., Rolland et al., 1997; Truby & Paxton, 2002; Vander Wal & Thelen, 2000), overweight/obese children were significantly more likely than healthy-weight children to report body dissatisfaction (in the form of desire for a smaller body size). They also reported significantly greater body dissatisfaction scores than healthy-weight children. Despite this, an important finding from the present study was the significant proportion of healthy-weight participants (47%) who reported body dissatisfaction in the form of desire for a smaller body size. This suggests that desire for a figure thinner than one’s perceived figure is not only reported by overweight/obese children, but also by healthy-weight children where weight loss may result in physical problems such as malnutrition (Gowers et al., 1991; Mallick, 1983). This finding also supports the proposition that beliefs about the importance of weight and shape, regardless of actual weight status, are influential in the experience of body dissatisfaction (Levine & Smolak, 2002).

Although a significant proportion of children reported body dissatisfaction, both boys and girls, and healthy-weight and overweight/obese children, significantly underestimated their body size. This finding supports research by Truby and Paxton (2002) and Pettigrew, Pescud, and Donovan (2011) that also found boys and girls significantly underestimate their CBIS figure. These findings suggest that children may not be very accurate in estimating their body size. This is particularly the case for overweight/obese children who underestimated their body size significantly more than healthy-weight children. Further research that investigates why this may be the case is necessary. One possible hypothesis is that underestimation of body size in overweight children may serve a self-protective function. Overweight children may underestimate their weight to protect their self-esteem and maintain a positive self-image, thus minimizing the psychological impact of their obesity (Manus & Killeen, 1995). It can be suggested, then, that the significant underestimate of body size in overweight/obese...
participants in the present study may have been employed by this subsample to protect themselves from negative self-evaluations. Inspection of body dissatisfaction and body distortion scores within the overweight/obese sample in this study provides support for this possibility, with overweight/obese children who overestimated their body size markedly more dissatisfied than those who underestimated or accurately estimated their body size.

A significant minority of children in the present study were found to have engaged in eating disordered behaviours in the four weeks prior to the assessment. Specifically, this study found that (a) a significant minority of children had a score on the ChEDE Global scale that was more than 1 standard deviation above the mean on community norms, indicating that they experience symptoms of a subclinical severity, and (b) a significant minority of children reported engaging in binge eating. Gender and weight category differences were evident, with significantly more girls than boys, and significantly more overweight/obese children than healthy-weight children, reporting symptoms of increased severity. These findings suggest that by ages 6 to 11, some children are already aware of the relationship between eating, exercise, and weight. Additionally, consistent with previous research, these findings suggest that even at this young age, the foundations may be laid for the development of eating disturbances, with certain subpopulations (such as overweight children) at particular risk for the subsequent development of disordered eating (Berger et al., 2005; McVey, Tweed, et al., 2004; Ricciardelli et al., 2000; Ricciardelli et al., 2003; Tanofsky-Kraff et al., 2004).

A final finding of interest was the significant overall decrease in self-objectification, body dissatisfaction, body surveillance, and body shame over time, despite research suggesting that vulnerability to body image disturbance increases as children approach adolescence and become more aware of societal ideals (Field, Cheung, et al., 1999). However, the present findings are consistent with other research
that suggests that body image disturbance and eating disorder symptoms may decrease when assessed repeatedly over time (Davison et al., 2003; Ohring et al., 2002). It is unlikely these decreases over time reflect true decreases in concern. Rather, it is likely these decreases reflect a methodological artefact of repeated assessment, whereby participants are more inclined to provide socially desirable responses and become more comfortable with the assessment procedures over repeated assessments (Davison et al., 2003; Jorm, Duncan-Jones, & Scott, 1989; Windle, 1955). In other words, test sensitisation may have occurred, with children developing response biases or losing interest in completing the same questions repeatedly (Wertheim, Paxton, & Blaney, 2009).

It is also possible that decreases over time were reflective of regression to the mean whereby larger scores at T1 tend to become more “normal” over time. This suggestion is supported by the significant negative covariation found between the intercept and slope factors of body dissatisfaction and body surveillance, and by the finding that for all constructs under investigation, T1 variance was larger than T2 and T3 variance. Finally, the fact that all body image disturbances decreased over time makes sense given the corresponding increase in underestimation of body size. If, over time, children perceive their body size to be increasingly smaller than it actually is, then decreases in body dissatisfaction and body shame are to be expected (provided a smaller body size is desired, which it was for 52% of the sample).

Despite decreases in some of the constructs over time, a decrease in ChEDE global scores was not found. As recommended by Wertheim et al. (2009), further research is needed to examine the meaning of the conflicting findings of cross-sectional and longitudinal research on body image. Future research should evaluate the possibility of test sensitisation and regression to the mean by including additional untested samples at each assessment point. Future research should also examine interindividual
differences in change over time and possible predictors of these differences, as significant variance in initial levels of the constructs of interest and significant variance in change of the constructs over time was found. This suggests that the addition of predictor variables to the various growth models may improve model fit and help researchers understand what predicts change in body image over time.

4.5.1. Limitations. Despite the abundance of descriptive information gathered in the present study, several limitations of this investigation need to be addressed. First, although the interview assessments provided complete privacy during weighing and measuring, and allowed the interviewers to deal appropriately with the sensitive nature of the content being discussed, it is possible that older children in the present sample may have been reluctant to admit their true thoughts and behaviours in a one–on–one encounter with an adult, as found by Combs et al. (2011). Perhaps present estimates of self-objectification, body dissatisfaction, and eating disorder symptoms reflect an underestimate of these disturbances, with participants revealing less than they would have if given a confidential questionnaire.

Second, as with Study 1, the requirement of active parental consent resulted in a participation rate of 10%. This low participation rate may be a result of the overall increase in the number of requests for families to participate in research studies (Galea & Tracy, 2007). Parents may find the cumulative effect of being asked to participate in various studies tiresome. For the present study specifically, it is possible that parents did not want their children being taken out of class and potentially missing important learning opportunities and class tests. Parents may have also found the 2-year length of the study daunting. Finally, parental information sheets and consent forms were sent home with children. Given the age of the children targeted for recruitment, it is possible that these forms were lost in the process of being taken home or returned to school.
The low participation rate means it cannot be assumed that the sample was representative of the population from which it was drawn. Once again, there was a lower number of overweight and obese children in this sample than what would be expected based on national averages. Given the nature of the study, it could be that parents of overweight children did not want their children asked questions pertaining to physical appearance, and as such did not consent for them to participate. Valuable information regarding these individuals may have therefore been lost. The limited number of overweight or obese individuals did in fact preclude the use of some analyses, and the uneven sample sizes may have increased the Type I error rate in the analyses that were conducted. It was particularly difficult to draw firm conclusions regarding differences between healthy-weight and overweight/obese children on the diagnostic items of the ChEDE, with the absence of a categorical weight difference on some of these items likely due to the fact that there was inadequate statistical power to detect such effects because of the relatively small number of children in the overweight/obese categories. Future research should therefore aim to obtain a more balanced, and larger, sample. Future research should also aim to obtain a more diverse sample with respect to ethnicity as the present study comprised predominantly Caucasian participants.

A final limitation is that desire for muscularity was not examined. Indeed, a problem with figure rating scales is that they do not distinguish between increased size due to muscle and increased size due to fat (Cohane & Pope, 2001). A mesomorphic muscular body build is of growing importance in Western societies, with previous research finding that both boys and girls worry about their muscles in addition to their weight (McCabe & Ricciardelli, 2005). Muscularity concerns are also being increasingly recognised as an important component of male body image (Jones & Crawford, 2005). Given the paucity of research examining weight concerns and eating
disorder symptoms in boys, and the lack of validated scales examining desire for muscularity in both boys and girls, the present study sought to examine only weight and shape disturbances. Future research should endeavour to create valid measures examining muscularity concerns in children so further progress can be made in this field. Future research should also endeavour to create figural rating scales that are appropriate for all age ranges. As highlighted by R. Gardner (2002), figure rating scales are age-specific and single scales may not be appropriate for all age ranges. It is also important to note that figure rating scales are not measures of affective body image disturbance. Rather, they assess the discrepancy between an individual’s perceived figure and their ideal figure. This is a cognitive process that may or may not be accompanied by a negative emotional response (Stanford & McCabe, 2002). Although their ease of use with children means that figure rating scales are, at present, one of the most commonly used measures for collecting information regarding body dissatisfaction (Dohnt & Tiggemann, 2005), the discrepancies they identify do not consider how invested participants are in achieving their ideal figure or how distressed they are when they cannot achieve their ideal. Assessment tools examining affective body dissatisfaction in children are therefore needed and, given the popularity of figure rating scales, efforts should be made to make these measures as valid and reliable as possible.

4.5.2. Strengths. Despite these limitations, the present study had several strengths. First, the use of one–on–one interviews provided a way to deal appropriately with the sensitive nature of body image issues whilst also allowing for the assessment process to be appropriate for children of all ages in the study. These interview assessments were particularly beneficial when administering the ChEDE as they provided opportunities for clarification and increased precision with respect to the severity of various concerns and frequency of various behaviours.
The use of the ChEDE in the assessment of eating disorder symptoms also constituted a significant strength of this study. This measure has been carefully modified for use with children and is used in many clinical settings as an indicator of eating disorder symptoms. Given its length, however, research studies tend to use other measures in their assessment of eating disorder symptoms and frequently ask children about their dieting habits directly. Given the cognitive abilities of young children, the meaning that children attach to the word *diet* is unknown. The ChEDE circumvents this issue by asking children about their eating habits generally rather than using the word *diet*. In doing so, questions about whether differences across genders and weight categories stem from differences in the definition of certain terms are overcome.

Third, the LGM techniques utilised in the present study provided a statistically sophisticated measure of change in the constructs of interest over time. The inclusion of gender and weight category within these models also allowed for an examination of possible predictors of change over time. Perhaps the biggest strength of this study, however, is that it appears to represent the first examination of self-objectification in children. The finding that self-objectification scores in girls overlapped with those of adults and adolescents highlights the necessity of future work on self-objectification in children.

4.5.3. Conclusion. The present findings confirm that body ideals and eating disorder behaviours are embedded in the lives of girls and boys (both healthy-weight and overweight/obese) at a very early age, with body dissatisfaction and conceptualisations of dieting as a means to lose weight manifesting in a significant minority of children prior to adolescence. These findings support the proposition made by Phares, Steinberg, and Thompson (2004) that the normative body discontent that exists in adults and adolescents can exist in young children. These findings also imply that prevention programs targeting adolescents are being implemented too late,
potentially reducing their effectiveness. This is discussed in greater detail in Chapter 9, Section 9.4.

Given the prevalence of body image disturbance and eating disorder symptoms in children, the known implications of these disturbances on physical development, and the suggestion that negative body image, regardless of BMI, increases the risk of subsequent and sustained depression (Levine & Smolak, 2002) and eating disorders (Polivy & Herman, 2002; Stice, 2002), it is important to examine the underlying mechanisms that contribute to their development. As described in Chapter 2 (Section 2.6), the application of sophisticated longitudinal designs that address the underlying causal mechanisms among these factors, potential moderator variables, and outcomes is needed to allow for a greater understanding of the development of body surveillance, body shame, appearance anxiety, body dissatisfaction, and eating disorder symptomatology in children over time. Given that the present sample of girls reported levels of self-objectification on par with some samples of adolescents and adults, and that the prospective analyses conducted in this study highlighted the importance of examining predictor variables that may account for interindividual differences in growth of body image disturbance and eating disorder symptoms over time, a multivariate conceptualisation of the role of self-objectification in the development of body image disturbance and eating disorder symptoms is warranted. The following chapters examine this role.
Chapter 5. Study 2b: A Test of Objectification Theory in Children

5.1. Overview

Study 1 developed and psychometrically evaluated the utility of modified versions of the Objectified Body Consciousness Scale for Youth (OBC-Y) and the Self-Objectification Questionnaire (SOQ) in an Australian sample of 6- to 11-year-old children. The psychometric properties of these measures were found to be adequate. Study 1 was an important precursor to the present study which aimed to longitudinally examine the applicability of objectification theory to children, and evaluate the role of self-objectification in the development of cognitive and behavioural eating disorder symptoms this population.

5.2. Introduction

As described in Chapter 2, objectification theory posits that learned cultural practices of objectification socialise individuals to self-objectify, that is, to treat themselves as objects to be looked at and evaluated (Fredrickson & Roberts, 1997). Self-objectification, in turn, fosters a self-consciousness characterised by the constant assessment or surveillance of physical appearance (Fredrickson & Roberts, 1997). This habitual body monitoring may result in a host of deleterious psychological experiences as individuals strive, and typically fail, to reach unrealistic and virtually unattainable cultural standards of beauty and thinness (Noll & Fredrickson, 1998).

Extensive research examining objectification theory in undergraduates and other adults has found that self-objectification and body surveillance, and their negative psychological consequences of body shame, appearance anxiety, and body dissatisfaction, are significantly associated with eating disorder symptomatology (e.g., Calogero & Thompson, 2009; Choma et al., 2010; Fredrickson et al., 1998; Greenleaf & McGreer, 2006; Noll & Fredrickson, 1998; Rolnik et al., 2010). The core tenets of objectification theory as it pertains to the development of eating disorders have also
been supported in cross-sectional studies that have examined the validity of the theory’s overall framework (Slater & Tiggemann, 2002; Tiggemann & Lynch, 2001; Tiggemann & Williams, 2012). In the most comprehensive of these cross-sectional tests, conducted by Tiggemann and Lynch (2001) on a diverse sample of Australian women, the overall framework of objectification theory received substantial support. Specifically: (a) self-objectification was associated with body surveillance; (b) body surveillance was associated with body shame and appearance anxiety; and (c) body surveillance, body shame, and appearance anxiety were associated with disordered eating. A more comprehensive model, incorporating the variables of age, body mass index (BMI), and body dissatisfaction, was also tested by Tiggemann and Lynch. This model also provided a good fit to the data, with body dissatisfaction mediating the relationship between body surveillance and disordered eating. The significant relationships observed by Tiggemann and Lynch in both tests of objectification theory are depicted in Figure 1.

These findings were recently replicated by Tiggemann and Williams (2012) in a sample of Australia female undergraduates. Mirroring the findings of a literature review by Szymanski et al. (2011), Tiggemann and Williams (2012) found that body shame and appearance anxiety were important mediators of the relationship between self-objectification and disordered eating. By contrast, the proposed mediators of reduction in peak motivational states and reduced awareness of internal bodily sensations offered no predictive utility.
Figure 1. Path diagram of significant pathways found in Tiggemann and Lynch’s (2001) test of objectification theory. The significant pathways found in their first test of objectification theory are depicted by the solid lines. The significant pathways found in their second, more comprehensive, examination of objectification theory are depicted by both the solid and broken lines.

Although comprehensive, the Tiggemann and Lynch (2001) and Tiggemann and Williams (2012) studies are limited in that they were cross-sectional in nature and, as such, a direct test of causal hypotheses could not be conducted and questions about the timing and underlying nature of body surveillance, body shame, and disordered eating development could not be answered. Additionally, most of the research in this area has been conducted on female undergraduates. The ability of objectification theory to account for disordered eating in males and children is unclear. However, in the few studies to have examined objectification theory in both males and females, gender has not been found to influence the nature of the relationships posited by this framework.
(Choma et al., 2010; Slater & Tiggemann, 2010), suggesting that objectification theory can also be applied to males.

Findings from the few studies to examine objectification theory in children suggest that additional research in this population is warranted. In two studies involving 319 boys and girls aged between 10 and 12 years (Lindberg et al., 2006) and 299 boys and girls aged between 11 and 13 years (Grabe et al., 2007), several of the core tenets of objectification theory, notably that body surveillance predicts body shame and body shame predicts dietary restraint, were confirmed. However, several limitations were evident. First, the Lindberg et al. (2006) study was cross-sectional in nature. Second, both studies did not explicitly examine self-objectification. Rather, its manifest, body surveillance, was used as an indicator of self-objectification. As described in Chapter 2 (Section 2.5), objectification theory clearly posits that self-objectification and body surveillance are distinct constructs. These limitations, combined with the small number of studies that have been conducted in young boys and girls to date, means that further investigation of objectification theory in this population is important, particularly if the processes involved in the development of body image disturbance and eating disorder symptomatology in children are to be elucidated.

5.2.1. Present study. Given the lack of empirical data examining the role of self-objectification in the development of eating disorders in children, and the limitations evident in previous research, the present study aimed to cross-sectionally and prospectively examine objectification theory in a sample of primary-school-aged children. The models of objectification theory presented in Figure 1 (original and comprehensive) were tested using structural equation modelling (SEM) techniques and evaluated in terms of their validity (overall goodness of fit) and predictive utility (ability to account for disordered eating). A secondary aim of the present study was to examine
gender differences in the pathways posited by objectification theory. It was hypothesised that:

1. The causal pathways posited by objectification theory and tested empirically by Tiggemann and Lynch (2001) would be supported in the present sample of children, with the cross-sectional models providing an overall good fit to the observed data.

2. The nature of the relationships posited by objectification theory would not differ between boys and girls.

As there do not appear to be any longitudinal research studies examining the role of self-objectification in the development of eating disorder symptomatology in children, specific hypotheses regarding the nature of prospective relationships were not made.

5.3. Method

5.3.1. Design. As with Study 2a, the present study was longitudinal in nature with information utilised from three assessment points: baseline (Time 1; T1), 1-year follow-up (Time 2; T2), and 2-year follow-up (Time 3; T3). Analyses were cross-sectional and longitudinal. Although cross-sectional analyses do not allow for the drawing of unequivocal causal inferences, the predicted relationships between the variables of interest were nonetheless tested to examine whether the observed paths would be consistent with those summarised in Figure 1. Longitudinal data were then examined because temporal precedence between the predictor and criterion variables is one circumstance under which claims for causal inference can be made in the context of nonexperimental data (Bryan, Schmiege, & Broaddus, 2007). Furthermore, a prospective design would allow for a greater understanding of the development of body surveillance, body shame, appearance anxiety, body dissatisfaction, and eating disorder symptomatology over time, and is essential in determining whether self-objectification
is a risk factor for eating disturbances. Data collection occurred between February 2010 and June 2012.

5.3.2. Participants and recruitment procedures. This research involved the same sample of children utilised in Study 2a (N = 253, 109 boys and 144 girls). Recruitment details, participant characteristics, and assessment protocols are identical to those reported in the earlier chapter (see Sections 4.3.2, 4.3.3, and 4.3.4). As such, this information is not presented again here. The present analyses involved only those participants who provided data at all three assessment points (n = 219, 94 boys and 125 girls). These participants ranged in age from 6 to 11 years (M = 8.37, SD = 1.43). As described in Chapter 4 (Section 4.3.2), attrition analyses indicated that participants who were successfully followed up did not differ significantly from those who were not successfully followed up on any variable.

5.3.3. Measures. As there is overlap between the measures used in Study 2a and those utilised in this research, only a brief summary of these measures is repeated below.

5.3.3.1. Weight and height. As noted in Chapter 3 (Section 3.3.3.1), participants were weighed and measured in light clothing and without shoes. Age- and gender-specific body mass index z-scores (BMI z-scores) were then calculated using the Center for Disease Control 2000 reference growth charts (Ogden et al., 2002). BMI z-score was included as a predictor variable in the comprehensive model.

5.3.3.2. Self-objectification. Self-objectification was included as a predictor variable in both the original and comprehensive models. The Modified Self-Objectification Questionnaire (SOQ), introduced and described in Chapter 3 (Section 3.3.3.3), was used to assess this construct. The SOQ measures the extent to which
individuals view their bodies in observable, appearance-based terms as opposed to nonobservable, competence-based terms.

5.3.3.3. **Body surveillance and body shame.** Body surveillance and body shame were included as both dependent and predictor variables in the original and comprehensive models. The Body Surveillance and Body Shame subscales of the Modified Objectified Body Consciousness Scale for Youth (OBC-Y), introduced and described in Chapter 3 (Section 3.3.3.2), were used to assess these constructs. As discussed in Chapter 4 (Section 4.3.3.4), internal consistency of scores on these subscales was adequate to good in the overall sample and in both boys and girls.

5.3.3.4. **Body dissatisfaction.** Body dissatisfaction was included as both a dependent and predictor variable in the comprehensive model. The Children’s Body Image Scale (CBIS; Truby & Paxton, 2002), introduced and described in Chapter 4 (Section 4.3.3.3), was used to assess this construct. As described in Section 4.3.3.3, the CBIS has been validated for use in Australian children between 7 and 12 years of age.

5.3.3.5. **Weight and shape concern and dietary restraint.** As validated scales assessing appearance anxiety in children have yet to be developed, weight and shape concern was used as an indicator of appearance anxiety in the original and comprehensive models tested in the present study. Weight and shape concern was included as both a dependent and predictor variable in these models.

In both the original and comprehensive models tested by Tiggemann and Lynch (2001), disordered eating was operationalised as high drive for thinness, body dissatisfaction, and bulimic tendencies as measured by the Eating Disorder Inventory (D. M. Garner et al., 1983). In the present study, dietary restraint was used as a measure of disordered eating and was included as a dependent variable in both models under investigation.
The Children’s Eating Disorder Examination (ChEDE; Bryant-Waugh et al., 1996), introduced and described in Chapter 4 (Section 4.3.3.5), was used to assess both weight and shape concern and dietary restraint. Specifically, the subscales of Weight Concern, Shape Concern, and Restraint were used as measures of cognitive and behavioural eating disorder symptoms respectively, as these components are critical in defining eating disorder symptomatology. As discussed in Chapter 4 (Section 4.3.3.5), internal consistency of scores in the overall sample was good for Shape Concern (Cronbach’s $\alpha = .86$) and adequate for Weight Concern (Cronbach’s $\alpha = .73$), but questionable for Restraint (Cronbach’s $\alpha = .64$). As such, only highly performing items on the Restraint, Weight Concern, and Shape Concern subscales were chosen as indicator variables in analyses. This selection process is described in detail in Section 5.3.4.1.

5.3.4. Statistical analysis. The present study utilised SEM techniques to test two models (original and comprehensive) of objectification theory. SEM is a comprehensive statistical methodology that allows researchers to test propositions regarding how constructs are theoretically linked, and the directionality of their relationship (Schreiber et al., 2006). Going beyond the power of factor analysis and multiple regression, SEM involves the estimation of a measurement model and a structural model. The measurement model is that part of the overall model that specifies the relationships of a set of measured or observed variables (e.g., questionnaire items designed to assess body shame) to their posited underlying theoretical or latent constructs (e.g., Body Shame). The structural model is that part of the overall model that specifies the hypothesised causal linear relationships among the latent constructs under investigation. The full structural model, or overall model, combines the measurement and structural models and therefore specifies the relationships of the indicators to the latent variables as well as the relationship of the latent variables to each other (Arbuckle & Wothke, 1999; B.
The validity of an entire theory, as hypothesised in the context of a structural model, can therefore be tested (Bryan et al., 2007; Kelloway, 1998).

SEM was selected as a statistical methodology because it permits the concurrent exploration of all paths specified in a model, while simultaneously testing the overall model for goodness of fit. In examining several multiple regression equations simultaneously, SEM can accommodate the use of multiple moderators and mediators within the model to be tested, allowing for an examination of direct, indirect, and total effects (Bryan et al., 2007; B. M. Byrne, 2012; R. B. Kline, 2011). A particular advantage of SEM is its ability to estimate the unique variance in each indicator, allowing researchers to control for measurement error within the overall model. This provides a more stringent test of the model under investigation as the relationships among latent variables are not biased by the presence of error in the indicators.

As the primary reason for working with a full SEM model is to assess the extent to which relationships between latent variables are valid, it is critical that the measurement model of each latent variable is psychometrically valid and adequate (B. M. Byrne, 2012). As such, various statisticians (e.g., Anderson & Gerbing, 1988; Tabachnick & Fidell, 1996) recommend a two-step modelling procedure of SEM and suggest that the adequacy of the measurement model be evaluated before the structural components of the model are estimated. This provides a confirmatory assessment of convergent and discriminant validity. Initial examination of the measurement model also ensures that indicators assumed to measure a hypothesised latent variable indeed measure that latent variable. This helps establish conceptually sound latent variables to be used in the final structural model (D. A. Cole & Maxwell, 2003; Schreiber et al., 2006). Given an acceptable measurement model, the second step is to test the combined measurement and structural model to assess for nomological validity (Cronbach &
Researchers cannot proceed with this overall test until proper measurement of the latent variables is achieved (D. A. Cole & Maxwell, 2003). The measurement and structural models under investigation in the present study are now described.

5.3.4.1. Measurement model. As the use of parcelling (averaging two or more items, responses, or behaviours to create an aggregate-level indicator) is somewhat controversial (Little, Cunningham, Shahar, & Widaman, 2002), individual scale items were used as indicator variables for the measurement model. Indicator variables for each latent construct were identified using several techniques. First, principal components analyses (PCAs) and confirmatory factor analyses (CFAs) of the OBC-Y and ChEDE were conducted to identify the items that accounted for the most variance in their respective factors. As a particular latent variable is effectively defined by what its indicators have in common (MacCallum & Austin, 2000), variables that had the largest conceptual overlap were retained. Items that cross-loaded onto other factors or that correlated highly with items tapping other latent constructs were eliminated as they do not represent unidimensional construct measurement and make the assignment of meaning problematic (Anderson & Gerbing, 1988). As it has also been recommended that indicators of separate latent variables should not be highly correlated (i.e., \( r \geq .90 \); Tabachnick & Fidell, 1996), bivariate correlations were then calculated between the selected indicators to ensure that indicators of different latent variables were adequately distinct.

It is strongly recommended that each latent variable be represented by multiple distinct indicators, with three or four indicators per latent variable recommended (Hair et al., 2010; R. B. Kline, 2011) and three indicators per latent variable considered optimal (Little, Lindenberger, & Nesselroade, 1999). This allows for the most unambiguous assignment of meaning to the estimated constructs and produces a more
efficient representation of these constructs and their interrelationships, reducing measurement error (Anderson & Gerbing, 1988; Little et al., 1999). The final measurement model in the present study therefore included three indicator items for each construct, with the exception of Weight and Shape Concern, where four indicator variables were used due to both weight concerns and shape concerns being assessed.

Constructs in the present study that were not measured with multiple test items (BMI $z$-score, self-objectification, body dissatisfaction) were treated either as latent variables (self-objectification) or observed variables (BMI $z$-score, body dissatisfaction). In turning self-objectification into a latent variable, this observed variable became a latent variable with a single indicator. As per the recommendations of Hayduk (1987) and Anderson and Gerbing (1988), the residual variance of this variable was therefore fixed to a prespecified level that reflected the reliability of the measure as calculated from the equation:

\[
\text{Residual variance} = (1 - \text{reliability}) \times \text{sample variance}
\]

The estimate of reliability used in this equation was an independent estimate of error variance drawn from prior research, as per the recommendations of Anderson and Gerbing (1988). This estimate was .92 (Myers & Crowther, 2007) and, as such, the prespecified level of error variance for self-objectification was fixed to 6.57. BMI $z$-score and body dissatisfaction were treated as observed variables as prior research has not adequately identified the reliability of the CBIS, and BMI $z$-scores were calculated from actual measurements of height and weight, as opposed to self-report, meaning measurement error would be minimal.

With the measurement model specified, a CFA was conducted to determine its validity. Latent constructs and error terms for each set of indicator variables, with the exception of Self-Objectification, were allowed to freely covary. This analysis was conducted in Mplus 6.0 (L. K. Muthén & Muthén, 2010). As the indicator variables
chosen in the present study were ordinal in nature (violating the multivariate normality assumption required for SEM), the robust weighted least squares mean- and variance-adjusted (WLSMV) estimator was utilised. Although there are a variety of ways to remedy non-normality, such as bootstrapping procedures, item parcelling, or data transformation, WLSMV is preferable to these procedures for the reasons outlined in Chapter 3 (Section 3.3.5.1). Briefly, however, this estimator is capable of providing accurate parameter estimates and standard errors in analyses involving ordinal multivariate non-normal variables. Furthermore, this estimator is less restrictive than other estimators with respect to sample size (T. A. Brown, 2006), as it is designed specifically for use with small to moderate samples (B. M. Byrne, 2012) and appears to work well in samples sizes $\geq 200$ (Beauducel & Herzberg, 2006; Flora & Curran, 2004; B. Muthén, du Toit, & Spisic, 1997). The sample size of the present study is above this minimum.

The measurement model was evaluated like any other SEM model, using goodness of fit measures. The fit indices used in the evaluation of fit (Comparative Fit Index [CFI], Tucker-Lewis Index [TLI], Root Mean Square Error of Approximation [RMSEA], Weighted Root Mean Square Residual [WRMR], model chi-square [$\chi^2$] and relative chi-square [$\chi^2/df$]) and their respective cutoffs were outlined in Chapter 3 (Section 3.3.5.1). Standardised residual covariances (which should be between -2.00 and +2.00) were also examined. Relative chi-square was particularly important to the present study as models with more than 12 observed variables that are fitted to the data of < 250 participants are likely to produce significant $p$ values even with good fit (Hair et al., 2010).

5.3.4.2. Structural model. After the measurement model had been estimated, the measurement model was combined with the structural model and the structural
pathways were specified. Feedback loops within the models were not specified due to the use of prospective data.

The sample size of the present study was sufficient to achieve power of 0.80 for the selected levels of degrees of freedom in the structural model (MacCallum, Browne, & Sugawara, 1996). Indeed, although SEM is a large sample technique, in many cases a sample size of about 200 is adequate for small- to medium-sized models and the sample size of the present study meets minimum criteria for analysis with SEM (i.e., $N > 150$ to 200; Hair et al., 2010).

The model to be tested met the requirements for overidentification, with at least three indicator variables per latent variable, no nondirected pathways between causally ordered variables, and positive degrees of freedom. The overall structural model was evaluated using the fit indices outlined in Chapter 3 (Section 3.3.5.1). As fit indices are influenced by sample size and the number and complexity of the specified pathways, model fit was also interpreted in conjunction with the predictive utility and theoretical grounding of the model in question. Potential model improvements were evaluated based on modification indices (MI) and expected parameter change (EPC) estimates. Decisions regarding the implementation of suggested modifications were made with a knowledge of the substantive theory and an adequate assessment of the statistical criteria.

Given the use of the WLSMV estimator, to statistically evaluate differences in model fit after the implementation of modification indices, the DIFFTEST option in Mplus was utilised where models were nested (i.e., one model was a subset of another). The chi-square difference test is only possible when models are identical with regard to indicator and latent constructs, and cross-model differences only relate to some pathways being present in one model and not the other. As the two models under investigation were not nested (i.e., each had different latent and indicator variables), it
was not possible to utilise chi-square difference tests to statistically compare the fit of these models. However, the predictive utility of each model was compared by examining overall goodness of fit statistics, the magnitude and significance of path coefficients, and the percentage of variance in dietary restraint accounted for by each model (Bryan et al., 2007).

5.3.4.3. Longitudinal analyses. As it is not possible to infer causality or directional influence in cross-sectional studies, longitudinal analyses were conducted on the present data. As the growth models evaluated in Study 2a (Chapter 4) found no significant variation in self-objectification, body surveillance, body shame, weight concern, or shape concern over time, it did not make theoretical sense, nor was it statistically feasible, to examine predictors in the context of multivariate Latent Growth Curve Modelling (LGM). As such, to examine the data prospectively, cross-lagged models were created that specified prospective associations between the variables of interest. It was not possible to specify prospective relationships between all variables in the two models under investigation as data from only three assessment points were collected and four were needed for this to occur. As such, a decision was made to focus on prospective associations between T1 Body Surveillance and T2 Body Shame and Weight and Shape Concern, and between T2 Body Shame and Weight and Shape Concern and T3 Dietary Restraint. A cross-sectional association was specified between T1 Self-Objectification and T1 Body Surveillance. Dependent variables were predicted by their prior levels (i.e., the dependent variable at \( t - 1 \)) to reduce the chance of obtaining spuriously inflated estimates of the causal paths of interest (D. A. Cole & Maxwell, 2003).

The longitudinal models were estimated using the maximum likelihood with robust standard errors (MLR) estimator, as this estimator is robust to violations of normality. WLSMV was not used on this occasion due to uneven cell counts at T2 and
T3 creating convergence difficulties in the analyses. Given the use of the MLR estimator, the Standardised Root Mean Square Residual (SRMR) was used instead of the WRMR. A value < .08 is indicative of adequate fit for the SRMR (Hu & Bentler, 1999).

5.3.4.3.1. Longitudinal measurement invariance. The validity of making comparisons across time assumes that the same construct is being measured at different occasions (MacCallum & Austin, 2000). Although in applied longitudinal research, measurement invariance (i.e., whether scores from the operationalisation of a construct have equivalent meaning under different conditions) is implicitly assumed, it is important that the degree of measurement invariance be formally investigated as it is misleading to analyse and interpret temporal change when invariance is unknown (T. A. Brown, 2006). The spurious influence of temporal change in measurement must be ruled out. As such, the stability of the models over time was examined to evaluate whether the parameters of interest were stable across all testing occasions.

In the present study, a multiple-group approach was used to assess longitudinal measurement invariance prior to conducting the aforementioned cross-lagged longitudinal analyses. This approach involves the specification of an unconstrained, configural invariance model that serves as the baseline against which to judge models where increasingly stringent and restrictive constraints have been imposed (B. M. Byrne, 2012; D. A. Cole & Maxwell, 2003; Millsap & Cham, 2012). After each set of constraints, a chi-square difference test is performed between the less restrictive baseline model and the more restrictive constrained model to empirically investigate changes in model fit as a result of the change in model specifications. The goal is to ensure that in constraining parameters across groups (in this case, constraining parameters across assessment points), one is not degrading the model. As such, a nonsignificant chi-square is desired (T. A. Brown, 2006). If noninvariance is found,
modification indices are examined to locate the specific parameters that are causing noninvariance (Millsap & Cham, 2012). Once these parameters have been identified, they can be systematically freed one at a time (beginning with those with the largest MI) and fit reexamined (Hair et al., 2010).

Measurement invariance is defined with varying degrees of stringency (Chen, Sousa, & West, 2005; Hair et al., 2010; Millsap & Cham, 2012). Given it is widely accepted that the testing of equality constraints bearing on error variances and covariances is excessively stringent, rarely achieved, and of little importance (Chen et al., 2005; Hair et al., 2010; Selig, Card, & Little, 2008), only metric invariance and scalar invariance were tested in the present study. Longitudinal metric invariance (or weak factorial invariance) occurs when the factor loadings of indicator variables on their respective latent factors do not differ significantly across time. Scalar invariance (or strong factorial invariance) tests for the equality of variable intercepts. An additional step taken by the present study was to test the equality of the structural paths, that is, the regression coefficients linking the latent variables.

As the implementation of partial measurement invariance is sufficient for the continuation of multiple-group analyses (B. M. Byrne, 2012), the less stringent standard of partial measurement invariance was adhered to instead of full measurement invariance. Partial measurement invariance occurs when at least some parameters estimates per construct are equivalent across time. The present study remained consistent with the recommendations of Hair et al. (2010), who reported a general consensus that if a minimum of two parameters per construct (e.g., two factor loadings in metric invariance, two intercepts in scalar invariance) are found to be invariant, the invariance testing process may proceed to the next stage. Partial invariance at any of the stages is considered a practical and acceptable standard (Hair et al., 2010). Indeed, according to T. A. Brown (2006), substantively more important longitudinal analyses,
such as cross-lagged effects among latent variables, can still be conducted in the context of partial measurement invariance.

The extent to which the models exhibited measurement and structural invariance over time was examined using Mplus 6.0. Model comparisons were conducted using the DIFFTEST procedure.

5.3.4.4. Gender differences. As the size of the present sample precluded the use of multiple-group analysis to examine invariance and model fit across the genders, gender interaction terms were calculated to allow gender differences in the relationships that form objectification theory to be investigated. For all cross-sectional and longitudinal pathways specified in the models, gender interaction terms were computed using the approach outlined by T. J. Kline and Dunn (2000), where variables are centered prior to producing the interaction terms (to prevent multicollinearity difficulties; Holmbeck, 2002). Interaction terms were created by multiplying gender \(0 = \text{male}, 1 = \text{female}\) by the proportionally weighted and centered composite score for the particular predictor variable of interest. Proportionally weighted composite scores are calculated using a set of component items, weighted for their relative contribution to the latent construct in question, and may also be referred to as factor scores for the latent variables within a model (Rowe, 2003). Centering was accomplished by subtracting the grand mean from each participant’s score on the predictor variables of interest.

Where significant interaction effects were identified, post hoc probing of the identified effects was conducted using the procedures outlined in Holmbeck (2002) and Aiken and West (1991). This allowed the significance of the simple slopes to be evaluated for boys and girls separately.
5.4. Results

5.4.1. Data suitability. Data were explored prior to analysis to ensure they did not violate the assumption of linearity. Scatterplots confirmed there were no curvilinear relationships between any of the assessed variables. As described in Chapter 4 (Section 4.4.1), outliers were retained as they were not truly aberrant.

Prior to analysis, data were also examined for missing values. Given the interview format of the assessment, missing values were minimal. Some missing values arose on the ChEDE (n = 22) and were predominantly found on Item 145 (Over the past four weeks, have you felt fat?). This is because overweight participants were not asked this question as specified in the ChEDE administration protocol. When ratings are missing on some items, Fairburn, Cooper, and O’Connor (2008) recommend obtaining a score for the subscale by dividing the resulting total by the number of rated items, provided more than half the items have been rated. As individual items (rather than subscale scores) were of interest to the present study, missing values were imputed with the mean score that the participant with the missing values obtained for that subscale, an equivalent procedure to that outlined by Fairburn et al. (2008). Scores from one participant were unable to be imputed as this participant did not answer more than half the items on some of the subscales. This data point was treated listwise. As described in Chapter 3 (Section 3.4.1), listwise deletion is considered acceptable if incomplete cases attributable to missing data comprise a percentage less than 5% of the number of total cases (Cameron & Trivedi, 2005) as “biases and loss of power are both likely to be inconsequential” (Graham, 2009, p. 554).

5.4.2. Descriptive information and preliminary analyses. Means and standard deviations for the variables of interest at each time point are presented in Table 1. This table presents means and standard deviations for the sample overall and for boys and girls separately.
Table 1

*Means (and Standard Deviations) of Self-Objectification and its Proposed Consequences for the Overall Sample and Boys and Girls*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-objectification</td>
<td>T1</td>
<td>-12.63 (9.06)</td>
<td>-13.04 (8.71)</td>
<td>-12.31 (9.34)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>n = 247</em></td>
<td><em>n = 106</em></td>
<td><em>n = 141</em></td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>-14.53 (8.83)</td>
<td>-15.15 (8.31)</td>
<td>-14.07 (9.21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>n = 229</em></td>
<td><em>n = 99</em></td>
<td><em>n = 130</em></td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>-15.49 (8.83)</td>
<td>-16.25 (8.11)</td>
<td>-14.92 (9.31)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>n = 219</em></td>
<td><em>n = 94</em></td>
<td><em>n = 125</em></td>
</tr>
<tr>
<td>Body surveillance</td>
<td>T1</td>
<td>2.75 (2.32)</td>
<td>2.70 (2.44)</td>
<td>2.79 (2.23)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.86 (1.95)</td>
<td>1.59 (1.79)</td>
<td>2.06 (2.04)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.61 (1.85)</td>
<td>1.29 (1.68)</td>
<td>1.84 (1.94)</td>
</tr>
<tr>
<td>Body shame</td>
<td>T1</td>
<td>2.87 (2.53)</td>
<td>2.83 (2.70)</td>
<td>2.90 (2.40)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.96 (2.16)</td>
<td>1.70 (2.00)</td>
<td>2.16 (2.27)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.71 (2.06)</td>
<td>1.45 (1.93)</td>
<td>1.90 (2.15)</td>
</tr>
<tr>
<td>Weight and shape concern&lt;sup&gt;a&lt;/sup&gt;</td>
<td>T1</td>
<td>0.45 (0.92)</td>
<td>0.27 (0.60)</td>
<td>0.59 (1.08)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.38 (0.82)</td>
<td>0.17 (0.47)</td>
<td>0.54 (0.98)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.34 (0.86)</td>
<td>0.17 (0.45)</td>
<td>0.47 (1.05)</td>
</tr>
<tr>
<td>Dietary restraint</td>
<td>T1</td>
<td>0.23 (0.56)</td>
<td>0.26 (0.66)</td>
<td>0.21 (0.47)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.24 (0.61)</td>
<td>0.23 (0.57)</td>
<td>0.26 (0.63)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.22 (0.59)</td>
<td>0.12 (0.32)</td>
<td>0.30 (0.73)</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>T1</td>
<td>0.64 (1.19)</td>
<td>0.39 (1.08)</td>
<td>0.83 (1.24)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.58 (0.94)</td>
<td>0.37 (0.76)</td>
<td>0.74 (1.03)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.45 (0.84)</td>
<td>0.24 (0.65)</td>
<td>0.61 (0.92)</td>
</tr>
</tbody>
</table>

<sup>Note</sup>. The per-cell sample sizes noted for self-objectification are also the per-cell sample sizes for all other variables presented in this table.

<sup>a</sup>Weight and shape concern scores represent a composite of selected items from both the Weight Concern and Shape Concern subscales of the ChEDE. The items from the subscales used to calculate the means and standard deviations presented in this table are those items that were also used as indicator variables in model testing.
To examine the cross-sectional relationships between each of the predictor variables (self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction) and the outcome variable (dietary restraint), Pearson correlations were computed for the overall sample and for boys and girls separately (Table 2). Significant associations between several of the variables emerged. In particular, in the sample overall, body shame and weight and shape concern were significantly and positively correlated with dietary restraint. A varied picture emerged between genders. Among boys, body shame and weight and shape concern were significantly and positively associated with dietary restraint. Among girls, only weight and shape concern was positively and significantly associated with dietary restraint.
Table 2

*Cross-Sectional Pearson Correlations Between the Variables Under Investigation for the Overall Sample and Boys and Girls*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Boys (in upper diagonal)</th>
<th>Girls (in lower diagonal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1  2  3  4  5  6</td>
<td>1  2  3  4  5  6</td>
<td>1  2  3  4  5  6</td>
</tr>
<tr>
<td>1. Self-objectification</td>
<td>– .36***</td>
<td>.25*** .19** .12 .11</td>
<td>– .37*** .19 .16 .02 .18</td>
</tr>
<tr>
<td>2. Body surveillance</td>
<td>– .52***</td>
<td>.38*** .13 .09</td>
<td>.35*** – .56*** .34*** .14 .03</td>
</tr>
<tr>
<td>3. Body shame</td>
<td>– .47***</td>
<td>.19** .19**</td>
<td>.30*** .48*** – .30** .06 .23*</td>
</tr>
<tr>
<td>4. Weight and shape concern&lt;sup&gt;a&lt;/sup&gt;</td>
<td>– .33***</td>
<td>.35*** .21* .41*** .60*** – .22* .53**</td>
<td></td>
</tr>
<tr>
<td>5. Body dissatisfaction</td>
<td>– .13</td>
<td>.17 .12 .29** .36*** – .15</td>
<td></td>
</tr>
<tr>
<td>6. Dietary restraint&lt;sup&gt;b&lt;/sup&gt;</td>
<td>– .06</td>
<td>.14 .16 .26** .12 –</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Weight and shape concern scores represent a composite of selected items from the Weight Concern and Shape Concern subscales of the ChEDE. The items from the subscales used to calculate the correlations presented in this table are those items that were also used as indicator variables in model testing.

<sup>b</sup>Due to significant skewness and kurtosis on these variables, transformed scores were used in the calculation of correlations.

*p* < .05. **p** < .01. ***p*** < .001.
5.4.3. Cross-sectional test of the models.

5.4.3.1. Model 1. As empirically demonstrated by Tiggemann and Lynch (2001), self-objectification has its effects on dietary restraint via body surveillance, body shame, and appearance anxiety. As such, this model predicts that: (a) Self-Objectification will account for significant unique variance in Body Surveillance; (b) Body Surveillance will account for significant unique variance in Body Shame, Weight and Shape Concern, and Dietary Restraint; and (c) Body Shame and Weight and Shape Concern will account for significant unique variance in Dietary Restraint.

5.4.3.1.1. Measurement model. As described in Section 5.3.4.1, PCAs and CFAs of the OBC-Y and ChEDE were conducted to identify the items that accounted for the most variance in their respective factors. The identified items for Body Surveillance were OBC-Y Items 1 (During the day, I think about how I look many times), 4 (I often compare how I look with how other people look), and 6 (I often worry about how I look to other people). Identified items for Body Shame were OBC-Y Items 7 (I feel like I must be a bad person when I don’t look as good as I could), 8 (I feel ashamed of myself when I haven’t made an effort to look my best), and 9 (When I’m not the size I think I should be, I feel ashamed). Identified items for Weight and Shape Concern were ChEDE Items 135 (Dissatisfaction with weight), 142 (Fear of weight gain), 143 (Discomfort seeing body), and 146 (Flat stomach). Identified items for Dietary Restraint were ChEDE Items 102 (Restraint over eating), 105 (Food avoidance), and 106 (Dietary rules). Many indicators of different latent variables were significantly correlated ($r = .14$ to .38), but did not reach .90. These results therefore support the distinctiveness and unidimensionality of each latent variable, a necessary condition for assigning meaning to estimated constructs (Anderson & Gerbing, 1988). Coefficient $H$ for each latent construct equated to .71 for Body Surveillance; .77 for Body Shame; .90 for Weight and Shape Concern; and .91 for Dietary Restraint. These coefficients are
adequate to excellent, supporting the reliability of the indicators (Hancock & Mueller, 2001).

When the measurement model was fitted to the data using CFA, a converged, admissible solution was obtained. The measurement model was a good fit to the observed data with a nonsignificant chi-square, $\chi^2(68) = 73.39$, $p = .306$. All fit indices met the standards outlined for excellent fit ($\chi^2/df = 1.10$, CFI = 1.00, TLI = .99, RMSEA = .02, RMSEA 90% CI [.00, .05], WRMR = 0.60). Standardised and unstandardised factor loadings and unique errors associated with the observed variables are presented in Table 3. Each indicator loaded significantly and strongly on its specified latent factor. The majority of indicators had factor loadings $> .70$ on their specified factor. No modification indices were suggested. This testing of the measurement model suggested that the indicators assumed to measure their hypothesised latent variable do, indeed, measure that latent variable and, as such, the measurement model is validated. Testing of the structural model may therefore proceed.
### Table 3

**Standardised and Unstandardised Factor Loadings and Unique Errors Associated With the Measurement Model**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Indicator</th>
<th>Mean (SD)</th>
<th>$b'$</th>
<th>$b$</th>
<th>SE</th>
<th>$b$ SE</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Objectification</td>
<td>SOQ</td>
<td>-12.37 (9.06)</td>
<td>0.96</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>OBCY1</td>
<td>0.74 (0.76)</td>
<td>0.59</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY4</td>
<td>0.58 (0.78)</td>
<td>0.60</td>
<td>1.00</td>
<td>0.17</td>
<td>5.80</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>OBCY6</td>
<td>0.58 (0.78)</td>
<td>0.75</td>
<td>1.26</td>
<td>0.20</td>
<td>6.41</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body</td>
<td>OBCY7</td>
<td>0.29 (0.59)</td>
<td>0.68</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shame</td>
<td>OBCY8</td>
<td>0.59 (0.76)</td>
<td>0.72</td>
<td>1.05</td>
<td>0.16</td>
<td>6.42</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>OBCY9</td>
<td>0.65 (0.81)</td>
<td>0.77</td>
<td>1.13</td>
<td>0.17</td>
<td>6.61</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Weight and Shape Conc.</td>
<td>Ch135</td>
<td>0.32 (0.99)</td>
<td>0.79</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ch142</td>
<td>0.53 (1.15)</td>
<td>0.87</td>
<td>1.11</td>
<td>0.09</td>
<td>13.06</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Ch143</td>
<td>0.41 (1.17)</td>
<td>0.77</td>
<td>0.97</td>
<td>0.08</td>
<td>12.38</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Ch146</td>
<td>0.54 (1.32)</td>
<td>0.87</td>
<td>1.10</td>
<td>0.08</td>
<td>14.46</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Dietary</td>
<td>Ch102</td>
<td>0.53 (1.35)</td>
<td>0.94</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restraint</td>
<td>Ch105</td>
<td>0.05 (0.46)</td>
<td>0.76</td>
<td>0.80</td>
<td>0.14</td>
<td>5.70</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Ch106</td>
<td>0.25 (1.08)</td>
<td>0.62</td>
<td>0.66</td>
<td>0.16</td>
<td>4.13</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

*Note.* For identification purposes, one factor loading per latent variable was fixed to 1.00. These pathways were neither estimated nor tested.

#### 5.4.3.1.2. Structural model

When the structural model was fitted to the data, a converged, admissible solution was obtained. The hypothesised model provided a good fit to the observed data with a nonsignificant chi-square, $\chi^2(72) = 77.40, p = .310$. All fit indices for this model met the standards outlined for excellent fit ($\chi^2/df = 1.10$, CFI = 1.00, TLI = .99, RMSEA = .02, RMSEA 90% CI [.00, .04], WRMR = 0.63) and the majority of residuals were small and centered around zero.

Individual elements of the model were examined next. Unstandardised parameter estimates and standard errors for the structural model are presented in Table
4. Standardised parameter estimates and standard errors for the structural model are presented in Figure 2. Significant and positive direct effects were found between Self-Objectification and Body Surveillance, Body Surveillance and Body Shame, Body Surveillance and Weight and Shape Concern, and Weight and Shape Concern and Dietary Restraint. All significant pathways yielded medium to strong effects. Two key pathways within the model failed to reach significance: Body Surveillance to Dietary Restraint and Body Shame to Dietary Restraint.

Table 4

*Unstandardised Parameter Estimates and Standard Errors for the Structural Portion of Model 1*

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Dependent variable</th>
<th>$b$</th>
<th>$SE$</th>
<th>$b/SE$</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Objectification</td>
<td>Body Surveillance</td>
<td>0.03</td>
<td>0.01</td>
<td>4.74</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Body Shame</td>
<td>0.92</td>
<td>0.17</td>
<td>5.51</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Weight and Shape Concern</td>
<td>0.99</td>
<td>0.16</td>
<td>6.23</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Dietary Restraint</td>
<td>-0.90</td>
<td>0.65</td>
<td>-1.38</td>
<td>.169</td>
</tr>
<tr>
<td>Body Shame</td>
<td>Dietary Restraint</td>
<td>0.64</td>
<td>0.36</td>
<td>1.76</td>
<td>.078</td>
</tr>
<tr>
<td>Weight and Shape Concern</td>
<td>Dietary Restraint</td>
<td>0.81</td>
<td>0.28</td>
<td>2.95</td>
<td>.003</td>
</tr>
</tbody>
</table>

Self-Objectification accounted for 16% of the variance in Body Surveillance; Self-Objectification and Body Surveillance accounted for 59% of the variance in Body Shame and 52% of the variance in Weight and Shape Concern; and Self-Objectification, Body Surveillance, Body Shame, and Weight and Shape Concern accounted for 40% of the variance in Dietary Restraint. No modification indices were suggested from the analysis.
The hypothesis that body shame and weight and shape concern mediate the relationship between body surveillance and dietary restraint was assessed by examining the indirect effects. To confirm a mediated relationship, several criteria must be met (Baron & Kenny, 1986). First, the independent variable must significantly influence the dependent variable. Second, the independent variable must have a significant effect on the mediator. Third, the mediator must significantly impact the dependent variable.

As Body Surveillance did not influence Dietary Restraint, the requirements for mediation were not met. However, statisticians have noted that a significant direct path from the independent variable to the dependent variable may not be necessary, or even realistic, to imply mediation (L. M. Collins, Graham, & Flaherty, 1998; MacKinnon & Fairchild, 2009; Shrout & Bolger, 2002). As such, the present study examined the specific indirect effect from Body Surveillance to Dietary Restraint via Weight and
Shape Concern. The indirect effect from Body Surveillance to Dietary Restraint via Body Shame was not examined as Body Shame did not influence Dietary Restraint and, as such, the third requirement for mediation was not met. The indirect effect of Body Surveillance on Dietary Restraint via Weight and Shape Concern was significant ($b = 0.81, b' = 0.49, z = 2.71, p = .007$).

5.4.3.2. Model 2. As empirically demonstrated by Tiggemann and Lynch (2001) in their second, more comprehensive, test of objectification theory as it pertains to eating disorders, self-objectification has its effects on dietary restraint via body surveillance, body shame, appearance anxiety, and body dissatisfaction. BMI also plays a role as a covariate. As such, this model predicts that: (a) Self-Objectification will account for significant unique variance in Body Surveillance; (b) Body Surveillance will account for significant unique variance in Body Shame, Weight and Shape Concern, Body Dissatisfaction, and Dietary Restraint; (c) Body Shame, Weight and Shape Concern, and Body Dissatisfaction will account for significant unique variance in Dietary Restraint; and (d) BMI z-score will account for significant unique variance in Body Shame, Weight and Shape Concern, and Body Dissatisfaction. Although age was included as a variable in Tiggemann and Lynch’s test of the model, given the restricted age range of the present sample this variable was not included in analyses.

5.4.3.2.1. Measurement model. As the measurement model is identical to that specified for Model 1, the results presented in 5.4.3.1.1 also apply to the present analysis. As such, they are not repeated.

5.4.3.2.2. Structural model. When the structural model was fitted to the data, a converged, admissible solution was obtained. Although the chi-square test of model fit indicated that the hypothesised model was a poor fit to the observed data, $\chi^2(96) = 123.23, p = .032$, fit indices for this model met the criteria outlined for adequate fit
\( \chi^2/df = 1.28, \) CFI = .96, TLI = .95, RMSEA = .04, RMSEA 90% CI [.01, .05], WRMR = 0.79), and the majority of residuals were small and centered around zero.

Individual elements of the model were examined next. Unstandardised parameter estimates and standard errors for the structural model are presented in Table 5. As standard errors for standardised parameters are not given when a weighted least squares estimation is used on a model with observed variables, only standardised coefficients are presented in Figure 3. In addition to the significant and positive direct effects found between several of the key pathways of interest in Model 1, significant and positive direct effects were found between Body Surveillance and Body Dissatisfaction; BMI z-score and Body Dissatisfaction; BMI z-score and Body Shame; and BMI z-score and Weight and Shape Concern. All significant pathways yielded medium to strong effects, with the exception of Body Surveillance to Body Dissatisfaction which yielded a small effect. Several pathways within this comprehensive model failed to reach significance, including Body Dissatisfaction to Dietary Restraint.
Table 5

*Unstandardised Parameter Estimates and Standard Errors for the Structural Portion of Model 2*

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Dependent variable</th>
<th>b</th>
<th>SE</th>
<th>b/SE</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Objectification</td>
<td>Body Surveillance</td>
<td>0.03</td>
<td>0.01</td>
<td>4.47</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Body Shame</td>
<td>0.78</td>
<td>0.17</td>
<td>4.62</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Weight and Shape Concern</td>
<td>0.89</td>
<td>0.17</td>
<td>5.33</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Body Dissatisfaction</td>
<td>0.29</td>
<td>0.14</td>
<td>2.04</td>
<td>.041</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Dietary Restraint</td>
<td>-0.67</td>
<td>0.37</td>
<td>-1.82</td>
<td>.069</td>
</tr>
<tr>
<td>BMI z-score</td>
<td>Body Dissatisfaction</td>
<td>0.51</td>
<td>0.08</td>
<td>6.46</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>BMI z-score</td>
<td>Body Shame</td>
<td>0.25</td>
<td>0.07</td>
<td>3.83</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>BMI z-score</td>
<td>Weight and Shape Concern</td>
<td>0.51</td>
<td>0.09</td>
<td>5.50</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Shame</td>
<td>Dietary Restraint</td>
<td>0.50</td>
<td>0.27</td>
<td>1.84</td>
<td>.066</td>
</tr>
<tr>
<td>Weight and Shape Concern</td>
<td>Dietary Restraint</td>
<td>0.57</td>
<td>0.21</td>
<td>2.77</td>
<td>.006</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>Dietary Restraint</td>
<td>0.03</td>
<td>0.08</td>
<td>0.32</td>
<td>.753</td>
</tr>
</tbody>
</table>

Self-Objectification accounted for 17% of the variance in Body Surveillance; Self-Objectification, Body Surveillance, and BMI z-score accounted for 51% of the variance in Body Shame and 66% of the variance in Weight and Shape Concern; and Self-Objectification, Body Surveillance, Body Shame, Weight and Shape Concern, and Body Dissatisfaction accounted for 29% of the variance in Dietary Restraint. Although Body Surveillance was significantly associated with Body Dissatisfaction, Body Dissatisfaction did not, in turn, predict Dietary Restraint, meaning Baron and Kenny’s (1986) requirements for mediation were not met. As such, the hypothesis that body dissatisfaction mediates the relationship between body surveillance and dietary restraint was not assessed.
Figure 3. Structural model (with standardised coefficients) for the test of Model 2. Broken lines represent residual (error) variances.

*\(p < .05\). ***\(p < .001\).

Two noteworthy modification indices were suggested from the analysis. The first recommended the inclusion of a causal pathway from Weight and Shape Concern to Body Surveillance (MI = 10.12, Standardised EPC = 0.47). This suggests a possible reciprocal relationship between weight and shape concern and body surveillance such that increased body surveillance may result in increased weight and shape concern, and increased weight and shape concern may result in further increases in body surveillance. Although theoretically justified, the inclusion of the feedback loop would have created a nonrecursive model and led to identification issues in the model. It was therefore not implemented.
The second modification recommended was the inclusion of a causal pathway from BMI $z$-score to Body Surveillance ($MI = 10.40, \text{Standardised EPC} = 0.28$). This pathway is theoretically justified; those with a larger BMI may be more likely to monitor and scrutinise their bodies and appearance as they become increasingly aware of their failure to conform to internalised societal ideals. This modification was therefore implemented. The implementation of this modification resulted in an improvement in model fit, $\chi^2(95) = 113.21, p = .098, \chi^2/df = 1.19, \text{CFI} = .97, \text{TLI} = .97, \text{RMSEA} = .03, \text{RMSEA 90\% CI} [.00, .05], \text{WRMR} = 0.75$. The improvement in model fit as a result of this modification was significant, $\chi^2(1) = 10.93, p < .001$.

5.4.3.3. Comparison of the models. The two models under investigation were not nested. As such, traditional chi-square difference tests could not be conducted and the models could not be statistically compared. The original model (Model 1), however, provided a better fit to the data, was more parsimonious, and accounted for a larger percentage of variance in dietary restraint.

5.4.4. Longitudinal analyses.

5.4.4.1. Longitudinal measurement invariance. As described in Section 5.3.4.3.1, a multiple-group SEM approach was used to examine the longitudinal measurement invariance of the two models. As the measurement models of the original and comprehensive models were identical, the following statistical evaluations of longitudinal measurement invariance apply to both.

As a preliminary analysis, the measurement model was assessed separately at each time point. The measurement model, although significant, was an acceptable fit to the data at T1, $\chi^2(59) = 78.69, p = .044, \chi^2/df = 1.33, \text{CFI} = .97, \text{TLI} = .96, \text{RMSEA} = .04, \text{RMSEA 90\% CI} [.01, .06], \text{WRMR} = 0.74$. It was also an acceptable fit to the data at T2, $\chi^2(59) = 103.18, p < .001, \chi^2/df = 1.75, \text{CFI} = .94, \text{TLI} = .92, \text{RMSEA} = .06, \text{RMSEA 90\% CI} [.04, .08], \text{WRMR} = 0.75$, and T3, $\chi^2(59) = 91.96, p = .004, \chi^2/df =
1.56, CFI = .95, TLI = .94, RMSEA = .05, RMSEA 90% CI [.03, .07], WRMR = 0.67. Additionally, inspection of the factor loadings at each time point revealed that each indicator loaded significantly on its specified latent variable. Given this consistency, formal testing could proceed.

First, a baseline (or configural invariance) model was specified in which all parameters were freely estimated across time. The first indicator of each latent factor was fixed to 1.00 and the factor means were fixed to 0 at each time point for identification purposes. The fit indices and model chi-square resulting from this specification are presented in Table 6. As can be seen, the model, with all parameters freely estimated across time, fit the data well, although the overall chi-square was significant. The central requirement that the same item must be an indicator of the same latent factor at each time point was met.

Second, to test for metric invariance, the chi-square from the baseline model was compared to the chi-square from a model where only factor loadings were constrained to be equal across time. Fit indices and model chi-square from this constrained model are presented in Table 6. The metric invariance model was a significantly poorer fit to the data, $\chi^2(9) = 26.72, p = .002$. Inspection of the modification indices revealed that the indicator Ch142, hypothesised to load on weight and shape concern, was problematic in terms of its equivalence over time, with the largest statistically significant index (MI = 40.77). This parameter was therefore freely estimated and the metric invariance model compared once more to the baseline model. No difference in fit between the baseline model was met.

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1Should a marker variable be noninvariant across time, differences found in subsequent tests of partial invariance may be an artefact of scaling the metric of the latent factor with an indicator that has a different relationship to that factor across time (T. A. Brown, 2006). As per T. A. Brown’s (2006) recommendations, the present study explored this possibility by rerunning the measurement invariance analyses with different marker indicators. No differences in results were found.
model and this partially invariant metric invariance model was found, $\chi^2(8) = 8.53$, $p = .383$.

Given that only one indicator was found to be noninvariant over time, the degree of partial measurement invariance was sufficient to carry out further invariance analyses (see Section 5.3.4.3.1). Scalar invariance was therefore examined. To test for scalar invariance, the chi-square from the baseline model was compared to a model where both factor loadings (with the exception of Ch142) and variable intercepts were constrained to be equal across time. Fit indices for this model are presented in Table 6. When the difference between this model and the baseline model was evaluated statistically, no significant difference in fit was found, $\chi^2(21) = 16.95$, $p = .714$. Modification indices did not suggest any points of localised misfit for the constrained intercepts.

Table 6

*Summary of Mplus Tests for Measurement Invariance Across Time*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2$/df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA [90% CI]</th>
<th>WRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline</td>
<td>275.79</td>
<td>199</td>
<td>1.39</td>
<td>.96</td>
<td>.96</td>
<td>.04 [0.03, 0.05]</td>
<td>1.35</td>
</tr>
<tr>
<td>2. Metric invariance</td>
<td>307.80</td>
<td>208</td>
<td>1.48</td>
<td>.95</td>
<td>.94</td>
<td>.05 [0.04, 0.06]</td>
<td>1.52</td>
</tr>
<tr>
<td>(Ch142 freely estimated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Partial metric invariance</td>
<td>277.13</td>
<td>207</td>
<td>1.34</td>
<td>.97</td>
<td>.96</td>
<td>.04 [0.03, 0.05]</td>
<td>1.39</td>
</tr>
<tr>
<td>and full scalar invariance</td>
<td>279.96</td>
<td>220</td>
<td>1.27</td>
<td>.97</td>
<td>.97</td>
<td>.04 [0.02, 0.05]</td>
<td>1.41</td>
</tr>
</tbody>
</table>

*Note.* CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, WRMR = Weight Root Mean Square Residual.
The measurement invariance testing process indicated that the two models under investigation met the criteria for configural invariance, partial metric invariance, and full scalar invariance. Given the superior predictive utility of the original model, the structural portion of this model was examined next to evaluate changes in the structural paths of the model over time. With partial metric invariance and full scalar invariance specified, all structural paths were constrained to equality and compared to a baseline model in which these paths were freely estimated.

The baseline model provided an acceptable fit to the data, although chi-square was significant, $\chi^2(223) = 282.80, p = .004, \chi^2/df = 1.27, \text{CFI} = .97, \text{TLI} = .97$, RMSEA = .04, RMSEA 90% CI [.02, .05], WRMR = 1.43. The model in which all structural paths were constrained to equality provided a poorer overall fit to the data, $\chi^2(233) = 330.12, p < .001, \chi^2/df = 1.42, \text{CFI} = .95, \text{TLI} = .95, \text{RMSEA} = .04, \text{RMSEA 90% CI [.03, .05], WRMR} = 1.71$. The reduction in fit associated with the restricted model was significant, $\chi^2(10) = 32.71, p < .001$. Examination of modification indices revealed that the path between Weight and Shape Concern and Dietary Restraint was particularly problematic (MI = 52.16). Freely estimating this parameter improved the overall fit of this model, $\chi^2(231) = 295.77, p = .003, \chi^2/df = 1.28, \text{CFI} = .97, \text{TLI} = .97$, RMSEA = .04, RMSEA 90% CI [.02, .05], WRMR = 1.55, and resulted in a nonsignificant chi-square difference test, $\chi^2(8) = 14.68, p = .066$. Examination of this structural path in more detail revealed that the association between Weight and Shape Concern and Dietary Restraint increased over time with standardised coefficients of 0.41, 0.75, 0.79 for T1, T2, and T3 respectively (unstandardised coefficients: 0.57, 1.47, 1.16).

5.4.4.2. Cross-lagged models. As described in Section 5.3.4.3, cross-lagged models were created to prospectively examine the relationships between the variables of interest for the two models. The items used as indicators of T2 Body Shame, T2 Weight
and Shape Concern, and T3 Dietary Restraint were T2 and T3 versions of the items used in the cross-sectional test of the models.

5.4.4.2.1. Model 1. When the cross-lagged original model was fitted to the data, a converged admissible solution was obtained. The model provided a poor fit to the data, with a significant chi-square, $\chi^2(238) = 368.18, p < .001$, and fit statistics that were suboptimal (CFI = .85, TLI = .82, SRMR = .09) to adequate (RMSEA = .05, RMSEA 90% CI [.04, .06], $\chi^2/df = 1.52$). Although the majority of residuals were small and centered around zero, several were notably large. The model accounted for 31% of the variance in T3 Dietary Restraint.

Individual elements of the model were examined next. Unstandardised parameter estimates and standard errors for the structural model are presented in Table 7. When examining the unstandardised coefficients, the causal relationship between T2 Body Shame and T3 Dietary Restraint was significant. When examining the standardised coefficients, none of the longitudinal structural pathways of interest were found to be significant (Figure 4).

Unspecified covariances revealed significant covariation between T1 Body Shame and T2 Dietary Restraint, and between T1 Weight and Shape Concern and T2 Dietary Restraint. The expected causal relationships between these variables were specified, one at a time, and the model estimated. These respecifications revealed that T1 Body Shame ($b = 1.69, SE = 1.10, p = .124, b' = 0.49, SE = 0.20, p = .014$) and T1 Weight and Shape Concern ($b = 0.83, SE = 0.31, p = .007, b' = 0.60, SE = 0.17, p < .001$) significantly predicted T2 Dietary Restraint.
Table 7

*Unstandardised Parameter Estimates and Standard Errors for the Cross-Lagged Test of Model 1*

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Dependent variable</th>
<th>b</th>
<th>SE</th>
<th>b/SE</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Self-Objectification</td>
<td>T1 Body Surveillance</td>
<td>0.02</td>
<td>0.01</td>
<td>3.44</td>
<td>.001</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Body Shame</td>
<td>0.23</td>
<td>0.15</td>
<td>1.56</td>
<td>.119</td>
</tr>
<tr>
<td>T1 Body Shame</td>
<td>T2 Body Shame</td>
<td>0.46</td>
<td>0.21</td>
<td>2.15</td>
<td>.031</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Weight and Shape Concern</td>
<td>0.13</td>
<td>0.17</td>
<td>0.74</td>
<td>.458</td>
</tr>
<tr>
<td>T1 Weight and Shape Concern</td>
<td>T2 Weight and Shape Concern</td>
<td>0.75</td>
<td>0.20</td>
<td>3.87</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>T2 Weight and Shape Concern</td>
<td>T3 Dietary Restraint</td>
<td>-0.14</td>
<td>0.34</td>
<td>-0.42</td>
<td>.675</td>
</tr>
<tr>
<td>T2 Body Shame</td>
<td>T3 Dietary Restraint</td>
<td>1.31</td>
<td>0.62</td>
<td>2.11</td>
<td>.035</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T3 Dietary Restraint</td>
<td>-0.01</td>
<td>0.39</td>
<td>-0.01</td>
<td>.991</td>
</tr>
<tr>
<td>T2 Dietary Restraint</td>
<td>T3 Dietary Restraint</td>
<td>0.37</td>
<td>0.28</td>
<td>1.32</td>
<td>.185</td>
</tr>
</tbody>
</table>

Modification indices recommending cross-sectional relationships between T1 Body Surveillance and T1 Weight and Shape Concern, and between T2 Weight and Shape Concern and T2 Dietary Restraint were recommended. However, as the present analysis was concerned with only prospective relationships, these modifications were not implemented. Modification indices reversing several relationships were also recommended. For example, paths from T1 Body Shame to T1 Body Surveillance, from T1 Weight and Shape Concern to T1 Body Surveillance, and from T2 Dietary Restraint to T2 Weight and Shape Concern were recommended. Although the inclusion of these paths makes theoretical sense (as described in detail in Section 5.5), these paths were not specified as their estimation would have led to the creation of a nonrecursive model and resulted in identification problems.
Figure 4. Structural model (with standardised coefficients and standard errors) for the cross-lagged test of Model 1. Broken lines represent residual (error) variances. Factors in italics are included to control for previous levels of the T2 and T3 variables under investigation.

**p < .01. ***p < .001.

5.4.4.2.2. Model 2. When the cross-lagged comprehensive model was fitted to the data, a converged admissible solution was obtained. The model provided a poor fit to the data, with a significant chi-square, $\chi^2(306) = 539.40, p < .001$, and fit statistics that were suboptimal (CFI = .78, TLI = .75, SRMR = .13) to adequate (RMSEA = .06, RMSEA 90% CI [.05, .07], $\chi^2/df = 1.76$). Although the majority of residuals were small and centered around zero, several were notably large, particularly those between BMI z-score and the various indicators. The model accounted for 38% of the variance in T3 Dietary Restraint.
Individual elements of the model were examined next. Unstandardised parameter estimates and standard errors for the structural model are presented in Table 8.

Table 8

Unstandardised Parameter Estimates and Standard Errors for the Cross-Lagged Test of Model 2

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Dependent variable</th>
<th>$b$</th>
<th>SE</th>
<th>$b$/SE</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Self-Objectification</td>
<td>T1 Body Surveillance</td>
<td>0.02</td>
<td>0.01</td>
<td>3.04</td>
<td>.002</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Body Shame</td>
<td>0.26</td>
<td>0.16</td>
<td>1.63</td>
<td>.102</td>
</tr>
<tr>
<td>T2 BMI z-score</td>
<td>T2 Body Shame</td>
<td>0.04</td>
<td>0.04</td>
<td>1.07</td>
<td>.283</td>
</tr>
<tr>
<td>T1 Body Shame</td>
<td>T2 Body Shame</td>
<td>0.39</td>
<td>0.19</td>
<td>1.99</td>
<td>.046</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Weight and Shape Concern</td>
<td>0.25</td>
<td>0.20</td>
<td>1.25</td>
<td>.212</td>
</tr>
<tr>
<td>T2 BMI z-score</td>
<td>T2 Weight and Shape Concern</td>
<td>-0.01</td>
<td>0.07</td>
<td>-0.14</td>
<td>.891</td>
</tr>
<tr>
<td>T1 Weight and Shape Concern</td>
<td>T2 Weight and Shape Concern</td>
<td>0.73</td>
<td>0.21</td>
<td>3.44</td>
<td>.001</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Body Dissatisfaction</td>
<td>0.77</td>
<td>0.27</td>
<td>2.83</td>
<td>.005</td>
</tr>
<tr>
<td>T2 BMI z-score</td>
<td>T2 Body Dissatisfaction</td>
<td>0.28</td>
<td>0.07</td>
<td>3.79</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>T1 Body Dissatisfaction</td>
<td>T2 Body Dissatisfaction</td>
<td>0.32</td>
<td>0.05</td>
<td>6.75</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T3 Dietary Restraint</td>
<td>-0.30</td>
<td>0.48</td>
<td>-0.63</td>
<td>.529</td>
</tr>
<tr>
<td>T2 Weight and Shape Concern</td>
<td>T3 Dietary Restraint</td>
<td>-0.33</td>
<td>0.35</td>
<td>-0.94</td>
<td>.348</td>
</tr>
<tr>
<td>T2 Body Shame</td>
<td>T3 Dietary Restraint</td>
<td>1.42</td>
<td>0.71</td>
<td>2.01</td>
<td>.045</td>
</tr>
<tr>
<td>T2 Body Dissatisfaction</td>
<td>T3 Dietary Restraint</td>
<td>0.29</td>
<td>0.13</td>
<td>2.25</td>
<td>.025</td>
</tr>
<tr>
<td>T2 Dietary Restraint</td>
<td>T3 Dietary Restraint</td>
<td>0.36</td>
<td>0.28</td>
<td>1.31</td>
<td>.191</td>
</tr>
</tbody>
</table>

Examination of the standardised coefficients (Figure 5) revealed that several key causal relationships were found to be significant, specifically the relationship between T1 Body Surveillance and T2 Body Dissatisfaction, the relationship between T2 Body
Shame and T3 Dietary Restraint, and the relationship between T2 Body Dissatisfaction and T3 Dietary Restraint. Once again, unspecified covariances revealed significant relationships between the control variables of T1 Body Shame and T1 Weight and Shape Concern, and T2 Dietary Restraint. The expected causal relationships between these variables were specified, one at a time, and the model estimated. These respecifications revealed that T1 Body Shame ($b = 1.61$, $SE = 1.04$, $p = .121$, $b' = 0.47$, $SE = 0.20$, $p = .016$) and T1 Weight and Shape Concern ($b = 0.82$, $SE = 0.31$, $p = .007$, $b' = 0.60$, $SE = 0.17$, $p < .001$) significantly predicted T2 Dietary Restraint.

*Figure 5.* Structural model (with standardised coefficients and standard errors) for the cross-lagged test of Model 2. Broken lines represent residual (error) variances. Constructs in italics are included to control for previous levels of the T2 and T3 variables under investigation.

*p < .05, ***p < .001.
Modification indices specifying cross-sectional relationships between T1 Body Surveillance and T1 Weight and Shape Concern, and between T2 Weight and Shape Concern and T2 Dietary Restraint were once again recommended. However, as the present analysis was concerned with only prospective relationships, these modifications were not implemented. Modification indices reversing several relationships were also once again recommended. These paths were not specified as their estimation would have led to the creation of a nonrecursive model and resulted in identification problems.

5.4.5. Gender differences. To clarify the nature of gender differences within the models, gender differences in the associations between the variables posited by objectification theory were examined using multiple regression analyses. Prior levels of the dependent variable under investigation were controlled for in longitudinal analyses.

Using a Bonferroni-adjusted significance level of .0125 to control for the familywise error rate, gender was found to significantly moderate the cross-sectional relationship between body surveillance and weight and shape concern, $F(3, 215) = 222.68, p < .001; F_{change}(1, 215) = 7.60, p < .001; R^2_{change} = .01, b = .25, SE = .09, \beta = .15, p = .006$. Gender also significantly moderated the cross-sectional relationship between weight and shape concern and dietary restraint, $F(3, 215) = 72.69, p < .001; F_{change}(1, 215) = 8.31, p = .004; R^2_{change} = .02, b = -0.30, SE = 0.11, \beta = -.24, p = .004$.

When examining prospective relationships, gender was found to significantly moderate the relationship between T2 body shame and T3 dietary restraint, $F(4, 212) = 51.15, p < .001; F_{change}(1, 212) = 9.51, p = .002; R^2_{change} = .02, b = 0.99, SE = 0.32, \beta = .26, p = .002$.

These interactions were probed using the procedure outlined by Holmbeck (2002). Results are summarised in Figures 6, 7, and 8. As shown, the positive association between T1 body surveillance and T1 weight and shape concern was significant in both girls, $t(215) = 21.17, p < .001$, and boys, $t(215) = 14.04, p < .001$, but
the association between T1 body surveillance and T1 weight and shape concern was significantly stronger in girls (Figure 6). The reverse was true for the positive association between T1 weight and shape concern and T1 dietary restraint; although significant in both girls, $t(215) = 10.10, p < .001$, and boys, $t(215) = 10.68, p < .001$, this association was significantly stronger in boys (Figure 7). The positive association between T2 body shame and T3 dietary restraint, controlling for the effects for T2 dietary restraint, was significant in both girls, $t(212) = 9.70, p < .001$, and boys, $t(212) = 3.44, p < .001$, but the association between T2 body shame and T3 dietary restraint was significantly stronger in girls (Figure 8).

**Figure 6.** Regression lines for relations between T1 body surveillance and T1 weight and shape concern, as moderated by gender, using proportionally weighted composite scores.

***$p < .001$.***
**Figure 7.** Regression lines for relations between T1 weight and shape concern and T1 dietary restraint, as moderated by gender, using proportionally weighted composite scores.

***p < .001.

**Figure 8.** Regression lines for relations between T2 body shame and T3 dietary restraint, as moderated by gender, using proportionally weighted composite scores and controlling for T2 dietary restraint.

***p < .001.
5.5. Discussion

The present study sought to cross-sectionally and prospectively examine objectification theory in young boys and girls. The two mediational models of objectification theory tested empirically by Tiggemann and Lynch (2001) were evaluated and compared in a sample of 6- to 11-year-old children. The results extend and complement those from previous research on objectification theory and the etiological significance of self-objectification in the development of cognitive and behavioural eating disorder symptoms.

It was hypothesised that the causal pathways posited by objectification theory and tested empirically by Tiggemann and Lynch (2001) would be supported in the present sample of children. This hypothesis was supported, with the original model (depicting the traditional pathways posited by objectification theory) providing an excellent fit to the data in cross-sectional analyses. The predictive utility of this model was adequate and the observed significant pathways were consistent with those hypothesised by objectification theory. Self-Objectification accounted for significant unique variance in Body Surveillance, Body Surveillance accounted for significant unique variance in Body Shame and Weight and Shape Concern, and Weight and Shape Concern accounted for significant unique variance in Dietary Restraint. Furthermore, consistent with the results of Tiggemann and Lynch (2001) and Tiggemann and Williams (2012), the path from Weight and Shape Concern to Dietary Restraint was stronger than the path from Body Shame to Dietary Restraint, supporting their suggestion that appearance anxiety (operationalised as weight and shape concern in the present study) is an important variable in the prediction of eating disorder symptoms. This finding is also consistent with cognitive-behavioural models of eating disorders, which hypothesise that overconcern with weight and shape is central to the maintenance of dietary restraint (Fairburn et al., 2003).
Results were less encouraging for the test of the comprehensive model of objectification theory, which incorporated BMI z-score and body dissatisfaction into the objectification theory framework. This model was a poorer fit to the data when compared with the original model. Although modification of this model, by creating a path from BMI z-score to Body Surveillance, significantly improved model fit, it nevertheless accounted for only 29% of the variance in Dietary Restraint (compared to 40% of the variance accounted for by the original model). This suggests that, at least in cross-sectional examinations of objectification theory in children, the original and more parsimonious model should be retained.

Although cross-sectional analyses provided some support for the role of self-objectification in the development of dietary restraint (as posited by objectification theory), the primary purpose of the present study was to prospectively examine these relationships. Measurement invariance testing revealed that the structural portion of the original model remained stable over time. That is, as children got older, the expected relationships between the variables posited by objectification theory remained significant. The relationship between Weight and Shape Concern and Dietary Restraint significantly increased over time, however, increasing the most between T1 (baseline) and T2 (1-year follow-up) when participants were approximately 8 and 9 years old respectively. This suggests that as children get older, those who report concern about their weight and shape are more likely to consider engaging in dietary restraint, again supporting cognitive-behavioural models of eating disorders (e.g., Fairburn et al., 2003). The localisation of this increasing association between weight and shape concern and dietary restraint at ages 8 to 9 suggests that programs aiming to prevent eating disorders should be implemented in early- to middle-childhood. Given the association between weight and shape concern and dietary restraint, efforts to prevent dietary restraint may
be best directed at children who are at risk for high weight and shape concern (such as overweight or obese children).

Neither the original nor the comprehensive cross-lagged models provided a good fit to the data. Although some of the fit indices suggested adequate fit, the majority were suboptimal. Although the original model provided a better fit to the data, it accounted for less of the variance in Dietary Restraint than did the comprehensive model, and none of the key longitudinal pathways of interest in the original model emerged as significant. The comprehensive cross-lagged model, in accounting for a larger proportion of the variance in Dietary Restraint, also had two of its key paths emerge as significant: T2 Body Shame and T2 Body Dissatisfaction to T3 Dietary Restraint. The fact that these pathways were significant in the longitudinal test of the model and not the cross-sectional test of the model suggests that these variables may be more important in the development of dietary restraint than in the maintenance of dietary restraint. This is consistent with the considerable research documenting body dissatisfaction as a risk factor for dieting and disordered eating (Polivy & Herman, 2002; Stice, 2002; Stice et al., 1998; Stice et al., 2002; Stice & Shaw, 2002; Thompson et al., 1995). It is important to replicate this finding, however, as body dissatisfaction was treated as an observed variable in the model, and was therefore error-perturbed. Perhaps when accounting for measurement error, the strength of the relationship between this variable and dietary restraint will differ.

The failure of several key pathways to reach significance in the longitudinal models highlights the need for further evaluation of the objectification theory model before it can be considered a valid framework for understanding the development of eating disorder symptoms in children. However, in interpreting the various findings, both significant and nonsignificant, it is important to recognise the nature of the measure used in the assessment of eating disorder symptomatology in the present study.
As detailed in Section 5.3.3.5, the present study operationalised eating disorder symptomatology as dietary restraint and used items on the Restraint subscale of the ChEDE as indicator variables of this construct. By contrast, Tiggemann and Lynch (2001) utilised the Drive for Thinness, Bulimia, and Body Dissatisfaction subscales of the Eating Disorder Inventory (D. M. Garner et al., 1983) to assess for eating disorder symptomatology. As such, Tiggemann and Lynch (2001) included both affective and cognitive factors in their operationalisation of disordered eating. It is possible that the operationalisation of eating disorder symptomatology as dietary restraint in the present study influenced the strength of the relationship between this variable and those preceding it in the objectification theory model, resulting in an underestimate of the true relationship among the tested variables. Perhaps if the cognitive components of eating disorders (e.g., fear of fatness, fear of weight gain) were assessed in addition to the behavioural components of eating disorders (e.g., dietary restraint, binge eating), model fit and the strength of the various relationships would have improved. Further examination of the tested models using a broader conceptualisation of disordered eating is warranted.

It is worth noting that modification indices for both the original and comprehensive cross-lagged models posited several reciprocal relationships between the variables under investigation. These paths were not specified as their estimation would have made interpretation of the models difficult. However, it is important to recognise these reciprocal relationships in the context of objectification theory and other theories of eating disorders. It has been suggested that cultural assumptions depicting weight and the body as infinitely malleable and controllable lead to the creation of an environment where dieting is considered to be a behaviour that promises relief from body shame and body dissatisfaction (Noll & Fredrickson, 1998). Specifically, the assumption of infinite malleability holds that with the right combination of diet and exercise, every person can
achieve the aesthetic ideal (Brownell, 1991). However, as discussed in Chapter 2 (Section 2.4.4.1), there is conflict between cultural ideals and physiology. Biological variables and genetics are influential in their regulation of body weight and shape, and according to Brownell (1991), biological barriers exist in many individuals that limit how much they can change their body weight and shape. For many, achieving the aesthetic ideal may be either (a) impossible or (b) only achievable with such intense, frequent exercise and strict dietary restraint that pursuing the ideal is detrimental to health (Brownell, 1991).

Weight-loss practices, such as dieting, may therefore paradoxically increase preoccupation with weight and shape, and heighten the experience of body shame and the awareness of failure to meet physical ideals (Harnden, McNally, & Jimerson, 1997; Noll & Fredrickson, 1998). Failure to maintain adequate control over food, failure to lose weight, and/or an inability to maintain weight loss may also increase body shame and weight and shape concern. This leads to the creation of a vicious cycle in which body shame, body dissatisfaction, and weight and shape concern lead to weight-loss efforts, and weight-loss efforts increase preoccupation with weight and shape and body shame when individuals fail to lose what they perceive to be an adequate amount of weight.

Modification indices, and subsequent analysis of these indices, also supported the existence of prospective relationships that were not specified explicitly within the model. Specifically, T1 Body Shame and T1 Weight and Shape Concern were both found to significantly predict T2 Dietary Restraint, suggesting that several of the relationships posited by objectification theory may indeed be supported prospectively, depending on the age of the participants under investigation. Specifically, body shame and weight and shape concern may predict the development of dietary restraint at a particular stage of development, after which these variables may contribute to the
maintenance, not development, of dietary restraint. Given the mean age of participants at T1 and T2, the predictive utility of body shame and weight and shape concern appears to be strongest between the ages of 8 and 9. This supports the results of the measurement invariance test, which revealed an increased association between weight and shape concern and dietary restraint at ages 8 to 9. It must be noted, however, that these conclusions are based on results from modification indices that may be idiosyncratic to the present sample. Replication is therefore needed.

Given the use of both boys and girls in the present sample, this study also examined possible gender differences within the models. Based on previous research by Choma et al. (2010) and Slater and Tiggemann (2010), it was hypothesised that the nature of the relationships posited by objectification theory would not differ between boys and girls. This hypothesis was partially supported with an examination of gender interaction terms revealing a significantly stronger association between T1 Body Surveillance and T1 Weight and Shape Concern, and between T2 Body Shame and T3 Dietary Restraint in girls compared to boys. Of particular interest is the longitudinal finding which suggests that the experience of body shame in girls is more important in the development of future dietary restraint than it is for boys, supporting Striegel-Moore and Smolak’s (2002) assertion that females are more likely than males to be sensitive to messages of slimness, and are therefore more likely to adopt the traditionally feminine behaviour of pursuing physical attractiveness.

Other gender interaction terms, however, revealed a significantly stronger association between T1 Weight and Shape Concern and T1 Dietary Restraint in boys than in girls, and no other relationships, both cross-sectional and longitudinal, were moderated by gender, suggesting that certain aspects of objectification theory as it pertains to eating disorders may be applicable to both sexes. These findings provide some support for previous research by Choma et al. (2010) who, after failing to find a
moderating effect of gender between the various constructs posited by objectification theory, concluded that the relationships among the constructs of body surveillance, body shame, and appearance anxiety were similar for males and females. Findings from the present study also support previous research by Slater and Tiggemann (2010) who, after finding that the proposed model of objectification theory was supported in both adolescent girls and boys, concluded that the mediational tenets of objectification theory may be applicable to both genders. Finally, the present study also supports previous research on appearance ideals which has found that the nature of sociocultural influences affecting body shape and size change strategies are similar across genders (Lawler & Nixon, 2011; Ricciardelli et al., 2000). Combined, these findings suggest that objectification theory is not a theory that should be exclusively applied to females. Broadening the applicability of the theory to males, as some researchers have now begun to do (e.g., Calogero & Thompson, 2009; Martins, Tiggemann, & Kirkbride, 2007), is an important step in understanding the aetiology of eating disorders in males and adequately exploring the consequences of self-objectification in this population. Should sample sizes permit, it would be useful for future studies to extend the present results by evaluating the tested models separately in boys and girls, allowing the overall validity of the models to be compared across male and female participants.

5.5.1. Limitations. The present study had some limitations that need to be taken into account when interpreting the findings. First, given the comprehensive nature of the interview, the measures used were brief and based on self-report rather than on actual measurements, observations, or clinical assessment. As with any study that relies on self-report, the use of self-report data introduces method variance and the possibility of bias. Specifically, responses may have been influenced by factors inherent in self-report testing such as social desirability, response biases, and memory recall. As described in Study 1 (Chapter 3, Section 3.5.3.3), it is also possible that older children in the sample
were reticent to answer such sensitive questions pertaining to weight and shape concern, which may have led to an overall underreporting of these concerns. Incorporation of additional data collection procedures, such as observational methods, qualitative interviews, and data from family members, may add to the strength of future studies.

Second, the sample size of the present study precluded multiple-group gender analyses from being conducted and therefore restricted the examination of gender differences. Cross-validation of gender differences in a larger sample is required, with the examination of model fit in boys and girls separately recommended.

Third, the use of three assessment points (rather than four) precluded all pathways from being specified prospectively. Additionally, although the original cross-lagged model provided a better fit to the data in the present sample, fit statistics for the model were still far from excellent and none of the key variables posited by objectification theory emerged as significant. Although two key pathways emerged as significant in the comprehensive cross-lagged model, fit statistics were poor. The poor fit associated with the two models may stem from (a) the characteristics of the sample and their scores (specifically, the low amount of variance on the indicators), (b) the numerous nonsignificant pathways within each model, and/or (c) the measures used to assess the constructs of interest. Cronbach’s alpha for the Restraint subscale used as a measure of disordered eating in the present study was .64. Although only highly performing items of this subscale were chosen as indicator variables for analyses, with a Coefficient $H$ of .91 noted for the latent variable of Dietary Restraint, it is possible that the low Cronbach’s alpha of the Restraint subscale may have attenuated the pathways leading to this variable. Additionally, several of the constructs (e.g., body shame and body surveillance, weight and shape concern and dietary restraint) were subscales of the same global measure. Although they are discussed as relatively distinct constructs and have been used separately in the past, measures designed as subscales reflecting a
common higher order construct (i.e., objectified body consciousness or eating disorder symptoms) may contain overlapping variance that would not be present if separate scales were used to measure the primary constructs of interest.

Indeed, the lack of variation in the data compromised the proportion of variance that could be explained by the independent variables, attenuating the correlation coefficients and precluding the use of multivariate LGM and Growth Mixture Modelling (GMM). These techniques are an alternative method for analysing the present data. They permit the examination of intraindividual change over time as well as interindividual variability in this change whilst also taking into account unobserved heterogeneity, thereby capturing individual differences in developmental trajectories over time (Duncan & Duncan, 2004; Preacher et al., 2008; Wang & Bodner, 2007). They also allow for more complex representations of development, with the growth of several constructs able to be incorporated in a growth model simultaneously. If incorporated within a latent class framework, the identification of unobserved subgroups of individuals that follow different growth trajectories is also possible. Additional evaluation of the models tested in this study, preferably using LGM or GMM as statistical techniques and with larger samples and/or clinical populations, is a worthwhile pursuit.

Fourth, the present research did not examine muscularity concerns which are increasingly being recognised as an important component of both male and female body image (Jones & Crawford, 2005; Ricciardelli & McCabe, 2001a). The role of self-objectification in the development of muscularity concerns is highly plausible and demands empirical attention. Given the age of the sample under investigation, however, it is highly likely that fruitful information regarding muscularity concerns would not have been obtained. Young children are bombarded with the anti-obesity message more than the muscularity message. It can therefore be suggested that they are more likely to
worry about their weight and less likely to worry about their muscles. Additionally, past research has found that concern with muscularity may emerge later in development, during adolescence (Jones et al., 2008). Given all participants were in middle-to-late childhood, findings regarding muscularity may have therefore been limited.

Finally, the lack of experimental manipulation in this study limits the confidence that can be placed in causal inferences. Although the longitudinal design of the present study allowed for the establishment of precedence and permitted greater inferential confidence regarding the direction of effects between variables, temporal precedence is not sufficient to imply causality; any apparent causal influence may be due to an intervening variable or to an omitted correlate of the putative cause (MacCallum & Austin, 2000). As such, third-variable explanations cannot be ruled out and causality must be considered with caution. Future studies should, ideally, endeavour to implement randomised prevention interventions aimed at decreasing self-objectification and body surveillance in children to examine the effect of reducing these putative risk factors on outcomes, and triangulate the results from prospective studies. The manipulation of the variables of objectification theory offers a powerful way of experimentally investigating the hypothesised relations among the variables. This information can then be used to definitively establish the consequences of self-objectification.

5.5.2. Strengths. Despite the aforementioned limitations, the present study had several strengths. First, as described in Study 1 (Chapter 3, Section 3.5.5), the use of one–on–one interviews provided a way to deal appropriately with the sensitive nature of body image issues whilst also allowing for the assessment process to be appropriate for children of all ages in the present study, providing additional support for the validity of the assessed constructs.

A second strength was the use of a sophisticated methodology for the analysis of the models under investigation. Many prior investigators of objectification theory and
disordered eating have used path analysis in lieu of SEM. As described in Section 5.3.4, SEM provides a more stringent test of the model, as it uses multiple indicators to estimate a construct and therefore controls for measurement error. More rigorous inferences about the causal relations implied by the models under investigation can therefore be made.

Perhaps the most important strength of the present study is that it appears to be the first to prospectively test objectification theory in children. As noted in Chapter 2 (Section 2.5), although eating disorders typically manifest during adolescence and young adulthood, the critical antecedent conditions, putative risk factors, and psychological processes that lead to the development of poor body image and eating disorder symptoms may be established or acquired in childhood (Dohnt & Tiggemann, 2006; R. M. Gardner et al., 2000; Kostanski & Gullone, 1998; Sands & Wardle, 2003; Schur et al., 2000). As such, the use of children, rather than adolescents, allowed for the development of body-related concerns to be assessed prior to their manifestation. Additionally, the use of both boys and girls in the present sample allowed gender differences in the degree of association between the variables posited by objectification theory to be considered. Although, as discussed in the limitations, the sample size of the present study precluded the use of multiple-group SEM to examine differences in overall model fit between boys and girls, the use of gender interaction terms allowed differential relationships between body surveillance, body shame, weight and shape concern, and dietary restraint to be documented.

Despite these strengths, this field of research would benefit from a more thorough understanding of the influence of the various sociocultural and psychological factors posited by objectification theory across the different stages of development. Specifically, it is recommended that future research in this area be conducted using prospective designs with a more extended age range of participants in order to follow
young children through to late adolescence, thereby capturing crucial periods of
development. It is also recommended that future studies accommodate several more
waves of data to more precisely estimate growth trajectory and increase reliability in the
measurement of change (Willett, 1989). If these data are used in conjunction with
piecewise growth analysis (which provides a means of subdividing a series of repeated
measurements into meaningful segments such as early childhood, middle childhood,
preadolescence, early adolescence, and late adolescence, and then summarises important
aspects of change within each segment; Duncan & Duncan, 2004), this would allow for
the detection of any changes in self-objectification and its putative outcomes that may
occur in the transition to adolescence and across other developmental periods. This type
of analysis has the added benefit of permitting the examination of predictors of change
in self-objectification and its putative outcomes that may be unique to a particular
developmental period, and also permits the examination of girls during the period of
greatest risk: middle to late adolescence.

It is also important for researchers to consider the possibility that other models
exist that fit the data equally well. For example, models that incorporate internalisation
of societal ideals, perceived pressure to conform to societal ideals, and/or appearance
schemas, may well fit the data to approximately the same degree. The influence of self-
objectification on the development of disordered eating should not be considered in
isolation (Fitzsimmons-Craft, 2011). Given the findings of the present research, it is
plausible that feedback loops and reciprocal relationships exist between dietary
restraint, body shame, and weight and shape concern, particularly when weight loss
attempts or strict dieting do not result in expected weight loss. Although these feedback
loops are more of a concern when all variables are measured contemporaneously, it is
important for researchers to be cognizant of these relationships and to employ strategies
and methods that critically evaluate whether these alternative feedback models might be justified substantively.

Finally, the present study focused specifically on dietary restraint as an eating disorder symptom. Future research should also examine the etiological significance of self-objectification and its negative psychological consequences in the development of other forms of disordered eating in children, such as binge eating.

5.5.3. Conclusion. The present study appears to be the first to prospectively test objectification theory in a child sample. Results suggest that objectification theory can be applied to children, with several of the posited relationships emerging as significant in cross-sectional evaluations of objectification theory, and some emerging as significant in longitudinal evaluations. These findings, in a sample of this age, suggest that targeting body image disturbance in adolescence may be too late, and that a failure to develop media literacy skills at an early age may increase vulnerability to unrealistic and unattainable media images in both boys and girls.

Although the focus of the present study was on the examination of objectification theory as it pertains to the development of eating disorders, objectification theory also posits the etiological significance of self-objectification in the development of depression. Given the significant comorbidity between depression and eating disorders observed by previous researchers (Blinder, Cumella, & Sanathara, 2006; Braun, Sunday, & Halmi, 1994; Geist, Davis, & Heinmaa, 1998; Herzog, Keller, Sacks, Yeh, & Lavori, 1992; Hudson et al., 2007; Jordan et al., 2008), it would be inappropriate to assume that these psychological disorders operate in isolation and do not influence one another within the broader framework of objectification theory. This influence is examined in the next chapter.
Chapter 6. Study 2c: An Extended Test of Objectification Theory in Children: The Addition of Depressed Mood

6.1. Overview

Studies 2a and 2b focused specifically on objectification theory as it pertains to the development of eating disorder symptoms in 6- to 11-year-old children. The degree to which young children self-objectify, and the ability of objectification theory to account for eating disorders symptoms in this population, were examined. Given objectification theory also posits the etiological significance of self-objectification and its negative psychological consequences in the development of depression, the present study extended the previous investigations of Studies 2a and 2b by focusing on the role of self-objectification in the development of both disordered eating and depressive symptoms in a sample of primary-school-aged children.

6.2. Introduction

As discussed in Chapter 2, objectification theory posits that cultures characterised by the objectification of males and females socialise individuals to self-objectify and to view their bodies as objects that must be constantly monitored and scrutinised to ensure they conform to internalised cultural standards. This constant body monitoring (i.e., body surveillance) can cause a host of deleterious psychological experiences, including body shame and appearance anxiety, with these negative states serving as antecedents to several psychological disorders, such as eating disorders, depression, and sexual dysfunction (Fredrickson & Roberts, 1997).

Although many studies have examined objectification theory as it pertains to the development of eating disorders, comparatively little research has examined depression as a putative outcome of self-objectification. In their proposal of objectification theory, however, Fredrickson and Roberts (1997) postulated several mechanisms by which
depression could result from self-objectification and its negative psychological consequences.

First, Fredrickson and Roberts (1997) argued that depression can result from the consistent failure to achieve an internalised unattainable ideal body and from the sense of helplessness individuals may experience when they realise they cannot conform to the ideal, nor control other people’s reactions to their physical appearance. Learned helplessness and a sense of loss of control play a crucial role in the development of depression (Abramson, Seligman, & Teasdale, 1978). People of all ages are bombarded with unrealistic, unobtainable, and highly stylised images of males and females that promote very narrow beauty and appearance ideals. They are also exposed to messages that promote the idea that the body is infinitely modifiable (Adams et al., 1993; Brownell, 1991). However, body weight is not as amenable to change as the media suggests (McKinley & Hyde, 1996), and longitudinal studies have found that dieting predicts low self-esteem and depression through the feelings of ineffectiveness and failure that are prompted by a repeated inability to sustain weight loss (Field et al., 2003; F. Johnson & Wardle, 2005; Neumark-Sztainer et al., 2006; Stice & Agras, 1998; Stice et al., 1999; Stice, Hayward, et al., 2000).

A reduction in peak motivational states, described in Chapter 2 (Section 2.4.4.2), is the second proposed mechanism by which self-objectification is postulated to result in depression. According to Fredrickson and Roberts (1997), objectification of the body interrupts peak motivational states by creating an environment in which individuals are made to feel self-conscious and self-objectify. This preoccupation with their bodies means individuals cannot fully immerse themselves in worthwhile physical and mental activities, reducing opportunities for positive experiences and pleasure and resulting in reduced quality of life. Having fewer positive experiences also reduces the opportunity for receiving positive reinforcement which, given the association between the rate of
positive reinforcement and intensity of depression, can result in depressive symptoms such as loss of motivation (Lewinsohn, 1974). This was evidenced by Gapinski, Brownell, and LaFrance (2003), who found that self-objectification was associated with lower levels of intrinsic motivation and self-efficacy in their sample of female undergraduates. As such, if individuals self-objectify and engage in habitual body monitoring, they cannot fully immerse themselves in worthwhile activities, resulting in reduced quality of life and depressed mood. This depressed mood can result in a motivational deficit to initiate worthwhile activities, further reducing the opportunity for positive reinforcement, creating a vicious cycle of negative affect.

Finally, objectification theory posits that experiences of sexual victimisation and harassment may also contribute to depression (Fredrickson & Roberts, 1997; Nolen-Hoeksema & Gurgus, 1994). The way in which experiences of sexual victimisation contribute to depression was not explained by Fredrickson and Roberts (1997); however, the aforementioned literature citing loss of control and learned helplessness as possible mechanisms may apply. Additionally, given objectification theory posits that individuals in Western society need to be attentive to the potential for sexual victimisation (Fredrickson & Roberts, 1997), it is possible that actual sexual victimisation could be seen as a failure to have been adequately careful, leading to self-blame and depression (Capitaine, Rodgers, & Chabrol, 2011).

In addition to these three mechanisms posited by objectification theory, recent research has implicated the process of habitual body monitoring rather than the consequences of habitual body monitoring in the development of depressive symptoms. According to Grabe et al. (2007), the habitual body monitoring that manifests from self-objectification can constitute a form of self-focused attention. Various studies have implicated self-focused attention in increasing vulnerability to depression (for a review, see Mor & Winquist, 2002). Self-focused attention has also been theorised to take the
form of worry or rumination (Fredrickson & Roberts, 1997). Given that a ruminative thinking style has been prospectively linked to increases in depressive symptoms and the onset of major depression in adults, adolescents, and children (Abela, Brozina, & Haigh, 2002; Lyubomirsky & Tkach, 2004; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Schwartz & Koenig, 1996), the self-focused attention and rumination elicited by self-objectification can further increase risk for depression.

Combined, these theoretical propositions support the suggestion that self-objectification may result in the development of depression (Fredrickson & Roberts, 1997). Of the few empirical studies that have examined objectification theory and depression, support for the tenets of objectification theory as it pertains to the development of depression has been found. In a study of female undergraduates by Muehlenkamp et al. (2005), negative body regard (operationalised as body shame, feelings and attitudes towards the body, and comfort with physical touch), fully mediated the relationship between self-objectification and depression. In a study of women by Szymanski and Henning (2007), self-objectification was associated with habitual body monitoring which, in turn, was associated with a reduction in peak motivational states, greater body shame, and greater appearance anxiety. These, in turn, were associated with depression. No significant direct pathways were observed between self-objectification and depression or between habitual body monitoring and depression, supporting the mediational tenets of objectification theory.

These findings were replicated prospectively by Grabe et al. (2007) in their sample of 11- to 13-year-old boys and girls. In support of Szymanski and Henning (2007), habitual body monitoring predicted the development of depressive symptoms among girls, but not boys, with body shame and rumination mediating the link between habitual body monitoring and depressive symptoms. As noted in Chapter 2 (Section
2.5), however, this study was limited in several ways; it’s most significant limitation being that it did not explicitly assess self-objectification.

The Grabe et al. (2007), Muehlenkamp et al. (2005), and Szymanski and Henning (2007) studies focused only on depression as an outcome variable. Given objectification theory offers the same set of contributing factors to both depression and eating disorders, it seems reasonable to assume that there would be some degree of overlap in these outcomes (Tiggemann & Kuring, 2004). Additionally, an extensive body of empirical evidence has indicated the presence of significant comorbidity between depression and eating disorders in adults, adolescents, children, outpatients, and inpatients (Blinder et al., 2006; Braun et al., 1994; Geist et al., 1998; Herzog et al., 1992; Hudson et al., 2007; Jordan et al., 2008). Given this comorbidity, a comprehensive test of objectification theory incorporating both eating disorder and depressive symptoms as outcome variables is warranted.

However, few examinations of objectification theory as it pertains to the development of both disordered eating and depression have been conducted to date. Of the few that have been conducted, significant support for the tenets of objectification theory has been found. In a study of male and female undergraduates by Tiggemann and Kuring (2004), self-objectification was associated with body surveillance which, in turn, was associated with body shame, appearance anxiety, and a reduction in peak motivational states in both males and females. In females, body shame and appearance anxiety were further associated with both disordered eating and depressed mood, whilst reduced peak motivational states was not associated with either disordered eating or depressed mood. In males, body shame and appearance anxiety were associated with disordered eating, whilst reduced peak motivational states and appearance anxiety were associated with depressed mood. In both males and females, reduced awareness of internal states was not associated with either disordered eating or depressed mood.
A more recent examination by Tiggemann and Williams (2012) on Australian female undergraduates partially supported these findings. Supporting Tiggemann and Kuring (2004), appearance anxiety mediated the relationship between body surveillance and both depressed mood and disordered eating. The relationship between body surveillance and disordered eating was also mediated by body shame. Reduction in peak motivational states was found to have no predictive utility. In contrast to Tiggemann and Kuring (2004), reduced awareness of internal states was found to mediate the relationship between body surveillance and depressed mood.

Presented in Figure 1 is a summary of the research findings on objectification theory as it pertains to disordered eating and depressed mood. As can be seen, fairly consistent support has been found for the mediating role of body shame and appearance anxiety in the link between self-objectification and the outcomes of depressed mood and disordered eating. By contrast, mixed or limited support has been found for the mediating role of reduced awareness of internal states in the link between self-objectification and disordered eating, and no support has been found for the role of reduced peak motivational states in the link between self-objectification and disordered eating. Mixed or limited support has also been found for the role of reduced peak motivational states and reduced awareness of internal states in the link between self-objectification and depressed mood.
Figure 1. Summary of research findings examining objectification theory as it applies to both disordered eating and depressed mood. Solid lines depict consistently supported findings, whilst broken lines depict findings with limited, mixed, or no support.

6.2.1. Present study. Previous findings suggest that self-objectification may be an important variable associated with both depressive symptoms and eating disorder symptomatology. However, support for this suggestion has only been found cross-sectionally in samples of undergraduates by Tiggemann and Kuring (2004) and Tiggemann and Williams (2012). A test of objectification theory as it pertains to both eating disorders and depression does not appear to have been conducted in children, nor has it been conducted longitudinally. Accordingly, the present study sought to extend previous work by furthering the understanding of the developmental processes and effects of self-objectification. The aim was to prospectively investigate the hypothesised contribution and etiological significance of self-objectification in the development of eating disorder symptoms and depressed mood in children.
Specific aims were to:

1. Determine whether the mediational model depicted by the solid lines in Figure 1 can be applied to children.\(^1\)

2. Examine the model in a multiple-wave, prospective study to test the proposed causal assumptions of the model.

3. Examine the relationship between dietary restraint and depressed mood within the objectification theory framework.

4. Examine gender differences in the relationships between the variables under investigation.

The present study used structural equation modelling (SEM) techniques to test the model of objectification theory as it applies to depressed mood and dietary restraint in boys and girls, and examined the role of both self-objectification and body surveillance (rather than equating self-objectification with body surveillance). It was hypothesised that:

1. The causal model depicted by the solid lines in Figure 1 would provide a good cross-sectional fit to the observed data. Additionally, the individual causal pathways posited by objectification theory, tested empirically by Tiggemann and Kuring (2004) and Tiggemann and Williams (2012), and depicted by the solid lines in Figure 1, would be supported in the present sample of children.

2. Significant comorbidity would be observed between depressed mood and dietary restraint.

\(^1\)Only the pathways depicted by the solid lines were examined for two reasons. First, as described above, these pathways have the most empirical evidence. Second, to the candidate’s knowledge, a measure designed to assess the reduction of peak motivational states in children has not been developed. Indeed, a standard measure assessing peak motivational states in adults has yet to be agreed upon, with many researchers creating their own measure specifically for use in their own studies.
3. The nature of the relationships posited by objectification theory would not differ between boys and girls.

As there do not appear to be any longitudinal research studies examining the role of self-objectification in the development of depressive symptoms and eating disorder symptomatology in children, specific hypotheses regarding the nature of prospective relationships were not made.

6.3. Method

6.3.1. Design. As with Studies 2a and 2b, this study was longitudinal in nature with information utilised from three assessment points: baseline (Time 1; T1), 1-year follow-up (Time 2; T2), and 2-year follow-up (Time 3; T3). Analyses were cross-sectional and longitudinal.

6.3.2. Participants and recruitment procedures. This research involved the same sample of children utilised in Studies 2a and 2b (N = 253, 109 boys and 144 girls). As recruitment details, participant characteristics, and assessment protocols are identical to those reported in the earlier chapters (see Sections 4.3.2, 4.3.3, and 4.3.4), this information is not repeated here. As with Study 2b, analyses involved only those participants who provided data at all three assessment points (n = 219, 94 boys and 125 girls). These participants ranged in age from 6 to 11 years (M = 8.37, SD = 1.43). As described in Chapter 4 (Section 4.3.2), attrition analyses indicated that participants who were successfully followed up did not differ significantly from those who were not successfully followed up on any variable.

6.3.3. Measures. As there is overlap between the measures used in Studies 2a and 2b and those utilised in this research, only a brief summary of these measures is repeated below. More detailed information is provided for scales not previously introduced.
**6.3.3.1. Self-objectification.** Self-objectification was included as a predictor variable in the model under investigation. The Modified Self-Objectification Questionnaire (SOQ), introduced and described in Chapter 3 (Section 3.3.3.3), was used to assess this construct.

**6.3.3.2. Body surveillance and body shame.** Body surveillance and body shame were included as both dependent and predictor variables in the model under investigation. The Body Surveillance and Body Shame subscales of the Modified Objectified Body Consciousness Scale for Youth (OBC-Y), introduced and described in Chapter 3 (Section 3.3.3.2), were used to assess these constructs.

**6.3.3.3. Weight and shape concern and dietary restraint.** Weight and shape concern was included as both a dependent and predictor variable in the model under investigation. Dietary restraint was included as a dependent variable in the model under investigation. The Children’s Eating Disorder Examination (ChEDE; Bryant-Waugh et al., 1996), introduced and described in Chapter 4 (Section 4.3.3.5), was used to assess these constructs. Specifically, the subscales of Weight Concern, Shape Concern, and Restraint were used as measures of cognitive and behavioural eating disorder symptoms.

**6.3.3.4. Depressed mood.** Depressed mood was included as a dependent variable in the model under investigation. The short-form Children’s Depression Inventory (CDI; Kovacs, 1985) was used to assess this construct. The short-form CDI is a 10-item self-report inventory developed to measure the affective, cognitive, and behavioural symptoms of depression in young children. Each item consists of three statements of increasing severity (*I like myself, I do not like myself, I hate myself*). Participants are asked to indicate which of the three statements best described them during the preceding two weeks. Items are scored on a 0- to 2-point scale with scores ranging from 0 to 20. Higher scores are indicative of greater depressed mood. The CDI has been used with
children as young as 6 years of age (Kazdin, French, & Unis, 1983), and prior research has demonstrated the high internal consistency of the full version of the CDI in children in Grades 3 to 6 ($\alpha = .78$; Sinton & Birch, 2006). In the present sample, ordinal coefficient alpha was .79.

6.3.4. Statistical analysis. The present study utilised SEM techniques (described in detail in Chapter 5, Section 5.3.4) to test the model depicted by the solid lines in Figure 1. Briefly, SEM is a comprehensive statistical methodology that allows researchers to test propositions regarding how constructs are theoretically linked, and the directionality of their relationship (Schreiber et al., 2006). A full structural model comprises both measurement and structural components and therefore specifies the relationships of the indicators to the latent variables as well as the relationship of the latent variables to each other (Arbuckle & Wothke, 1999; B. M. Byrne, 2012; Jöreskog & Sörbom, 1993; Ullman, 2007). The validity of an entire theory, as hypothesised in the context of a structural model, can therefore be tested (Bryan et al., 2007; Kelloway, 1998). The two-step modelling procedure (Anderson & Gerbing, 1988; Tabachnick & Fidell, 1996) described in Chapter 5 (Section 5.3.4) was adhered to in the present study.

6.3.4.1. Measurement model. The techniques used to create the measurement model of the present study are identical to those described in Study 2b (Chapter 5, Section 5.3.4.1) and are therefore not described in great detail here. Briefly, as per Study 2b, individual scale items were used as indicator variables for the measurement model under investigation. The indicator variables chosen for the factors of Body Surveillance, Body Shame, Dietary Restraint, and Weight and Shape Concern were those that were identified using the procedure outlined in Study 2b (Chapter 5, Section 5.3.4.1). Indicator variables for Depressed Mood were identified using principal components analyses (PCAs) and confirmatory factor analyses (CFAs) of the short-form CDI. Items that accounted for the most variance in depressed mood were retained. Items
that cross-loaded onto other factors were eliminated (Anderson & Gerbing, 1988). As
per the recommendations of Little et al. (1999), R. B. Kline (2011), and Hair et al.
(2010), the latent variable of Depressed Mood was represented by three indicators,
described in detail in Section 6.4.3.1.

Self-objectification was again treated as a latent variable, with the residual
variance of this variable fixed to the prespecified value of 6.57. With the measurement
model specified, a CFA was conducted to determine its validity. Latent constructs and
error terms for each set of indicator variables, with the exception of Self-Objectification,
were allowed to freely covary. This analysis was conducted in Mplus 6.0. As per Study
2b, the robust weighted least squares mean- and variance-adjusted (WLSMV) estimator
was utilised, as this estimator is capable of providing accurate parameter estimates and
standard errors in analyses involving ordinal multivariate non-normal variables and is
less restrictive than other estimators with respect to sample size (T. A. Brown, 2006).
The measurement model was evaluated using the same criteria introduced in Study 1
(Chapter 3, Section 3.3.5.1): Comparative Fit Index (CFI) > .95, Tucker-Lewis Index
(TLI) > .95, Root Mean Square Error of Approximation (RMSEA) < .06, Weighted
Root Mean Square Residual (WRMR) < 0.90, model chi-square ($\chi^2$) = nonsignificant,
relative chi-square ($\chi^2/df$) < 2.00.

6.3.4.2. Structural model. After the measurement model had been estimated, it
was combined with the structural model and the structural pathways were specified.
Feedback loops within the model were not specified due to the use of prospective data.
The model to be tested met the requirements for overidentification, with at least three
indicator variables per latent variable, no nondirected pathways between causally
ordered variables, and positive degrees of freedom. The overall structural model was
evaluated using the fit indices outlined above. The percentage of variance in the
dependent variables (i.e., Dietary Restraint and Depressed Mood) accounted for by the
model was also examined. Potential model improvements were evaluated based on modification indices (MI) and expected parameter change (EPC) estimates. Decisions regarding the implementation of suggested modifications were once again made with a knowledge of the substantive theory and an adequate assessment of the statistical criteria.

6.3.4.3. Longitudinal analyses. To examine the data prospectively, a cross-lagged model was created that specified prospective associations between the variables of interest. As it was not possible to specify prospective relationships between all variables (something that would have required four assessment points), a decision was made to focus on prospective associations between T1 Body Surveillance and T2 Body Shame and Weight and Shape Concern, and between T2 Body Shame and Weight and Shape Concern and T3 Dietary Restraint and Depressed Mood. A cross-sectional association was specified between T1 Self-Objectification and T1 Body Surveillance. Dependent variables were predicted by their prior levels to reduce the chance of obtaining spuriously inflated estimates of the causal paths of interest (D. A. Cole & Maxwell, 2003).

The longitudinal model was estimated using the maximum likelihood with robust standard errors (MLR) estimator, as this estimator is robust to violations of normality. WLSMV was not used on this occasion due to uneven cell counts at T2 and T3 creating convergence difficulties for analyses. Given the use of the MLR estimator, the Standardised Root Mean Square Residual (SRMR) was used instead of the WRMR. A value < .08 is indicative of adequate fit for the SRMR (Hu & Bentler, 1999).

6.3.4.3.1. Longitudinal measurement invariance. For reasons outlined in Study 2b (Chapter 5, Section 5.3.4.3.1), the stability of the model under investigation was examined to evaluate whether the parameters of interest were stable across all testing occasions and to rule out the spurious influence of temporal change in measurement.
Longitudinal measurement invariance was examined using the multiple-group approach outlined in Study 2b (Chapter 5, Section 5.3.4.3.1). As per Study 2b, only metric invariance and scalar invariance were tested in this study, as it is widely accepted that the testing of equality constraints bearing on error variances and covariances is excessively stringent and of little importance (Chen et al., 2005; Hair et al., 2010; Selig et al., 2008). This study also examined the equality of the structural paths over time. Consistent with Study 2b, and the recommendations of Hair et al. (2010), partial measurement invariance was used as a less stringent standard in this study.

6.3.4.4. Gender differences. As the size of the present sample precluded the use of multiple-group analysis to examine invariance and model fit across the genders, gender interaction terms were calculated for each predictor of Depressed Mood to allow gender differences in the relationships that form objectification theory to be investigated. Gender differences in the prediction of Dietary Restraint were not examined as these were investigated in Study 2b. The procedure for computing gender interaction terms and probing significant interaction effects was described in Chapter 2b (Section 5.3.4.4) and is not repeated here.

6.4. Results

6.4.1. Data suitability. Data were explored prior to analysis to ensure they did not violate the assumption of linearity. Scatterplots confirmed there were no curvilinear relationships between any of the assessed variables. As described in Chapter 4 (Section 4.4.1), outliers were retained as they were not truly aberrant. The treatment of missing values in this study was identical to the procedures reported in Study 2b (Chapter 5, Section 5.4.1). These are not repeated here.

6.4.2. Descriptive information and preliminary analyses. Means and standard deviations for the variables of interest at each time point are presented in Table 1. This
Table presents means and standard deviations for the sample overall and for boys and girls separately.

Table 1

*Means (and Standard Deviations) of Self-Objectification and its Proposed Consequences for the Overall Sample and Boys and Girls Separately*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-objectification</td>
<td>T1</td>
<td>-12.63 (9.06)</td>
<td>-13.04 (8.71)</td>
<td>-12.31 (9.34)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 247</td>
<td>n = 106</td>
<td>n = 141</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>-14.53 (8.83)</td>
<td>-15.15 (8.31)</td>
<td>-14.07 (9.21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 299</td>
<td>n = 99</td>
<td>n = 130</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>-15.49 (8.83)</td>
<td>-16.25 (8.11)</td>
<td>-14.92 (9.31)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 219</td>
<td>n = 94</td>
<td>n = 125</td>
</tr>
<tr>
<td>Body surveillance</td>
<td>T1</td>
<td>2.75 (2.32)</td>
<td>2.70 (2.44)</td>
<td>2.79 (2.23)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.86 (1.95)</td>
<td>1.59 (1.79)</td>
<td>2.06 (2.04)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.61 (1.85)</td>
<td>1.29 (1.68)</td>
<td>1.84 (1.94)</td>
</tr>
<tr>
<td>Body shame</td>
<td>T1</td>
<td>2.87 (2.53)</td>
<td>2.83 (2.70)</td>
<td>2.90 (2.40)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.96 (2.16)</td>
<td>1.70 (2.00)</td>
<td>2.16 (2.27)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.71 (2.06)</td>
<td>1.45 (1.93)</td>
<td>1.90 (2.15)</td>
</tr>
<tr>
<td>Weight and shape concerna</td>
<td>T1</td>
<td>0.45 (0.92)</td>
<td>0.27 (0.60)</td>
<td>0.59 (1.08)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.38 (0.82)</td>
<td>0.17 (0.47)</td>
<td>0.54 (0.98)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.34 (0.86)</td>
<td>0.17 (0.45)</td>
<td>0.47 (1.05)</td>
</tr>
<tr>
<td>Dietary restraint</td>
<td>T1</td>
<td>0.23 (0.56)</td>
<td>0.26 (0.66)</td>
<td>0.21 (0.47)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.24 (0.61)</td>
<td>0.23 (0.57)</td>
<td>0.26 (0.63)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.22 (0.59)</td>
<td>0.12 (0.32)</td>
<td>0.30 (0.73)</td>
</tr>
<tr>
<td>Depressed mood</td>
<td>T1</td>
<td>1.67 (1.94)</td>
<td>1.37 (1.61)</td>
<td>1.89 (2.13)</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.51 (1.99)</td>
<td>1.49 (2.03)</td>
<td>1.53 (1.98)</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.23 (1.82)</td>
<td>1.14 (1.61)</td>
<td>1.30 (1.97)</td>
</tr>
</tbody>
</table>

*Note.* The per-cell sample sizes noted for self-objectification are also the per-cell sample sizes for all other variables presented in this table.

aWeight and shape concern scores represent a composite of selected items from both the Weight Concern and Shape Concern subscales of the ChEDE. The items from the subscales used to calculate the means and standard deviations presented in this table are those items that were also used as indicator variables in model testing.
To examine the cross-sectional relationships between each of the predictor variables (self-objectification, body surveillance, body shame, weight and shape concern) and the outcome variables (dietary restraint, depressed mood), Pearson correlations were computed for the overall sample and for boys and girls separately (Table 2). In the sample overall, all variables were significantly and positively correlated with depressed mood. Body shame and weight and shape concern were significantly and positively correlated with both dietary restraint and depressed mood. A varied picture emerged between genders. Among boys, self-objectification, body shame, and weight and shape concern were significantly and positively associated with both dietary restraint and depressed mood. Among girls, only weight and shape concern was significantly and positively associated with both dietary restraint and depressed mood, with body surveillance and body shame found to be significantly associated with depressed mood only.

As expected, dietary restraint and depressed mood were significantly intercorrelated \((r = .14, p = .036)\). This intercorrelation was significant in boys \((r = .25, p = .016)\), but not in girls \((r = .08, p = .359)\). To determine whether self-objectification and its proposed consequences account for the interrelationship between dietary restraint and depressed mood in boys, partial correlations were examined. When self-objectification, body surveillance, body shame, and weight and shape concern were partialled out, the resulting partial correlation between dietary restraint and depressed mood was reduced to nonsignificance \((r = .09, p = .382)\), indicating that, in boys, the bulk of the common variance between dietary restraint and depressed mood was accounted for by self-objectification and its proposed consequences.
Table 2

Cross-Sectional Pearson Correlations Between the Predictor Variables and Outcome Variables of Interest for the Overall Sample and Boys and Girls

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Overall</th>
<th></th>
<th>Boys</th>
<th></th>
<th>Girls</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dietary</td>
<td>Depressed</td>
<td>Dietary</td>
<td>Depressed</td>
<td>Dietary</td>
<td>Depressed</td>
</tr>
<tr>
<td></td>
<td>restraint^b</td>
<td>mood</td>
<td>restraint^b</td>
<td>mood</td>
<td>restraint^b</td>
<td>mood</td>
</tr>
<tr>
<td>Self-objectification</td>
<td>.11</td>
<td>.16^*</td>
<td>.18^*</td>
<td>.29**</td>
<td>.06</td>
<td>.08</td>
</tr>
<tr>
<td>Body surveillance</td>
<td>.09</td>
<td>.28***</td>
<td>.03</td>
<td>.19</td>
<td>.14</td>
<td>.34***</td>
</tr>
<tr>
<td>Body shame</td>
<td>.19**</td>
<td>.34***</td>
<td>.23^*</td>
<td>.31**</td>
<td>.16</td>
<td>.37***</td>
</tr>
<tr>
<td>Weight and shape concern^ab</td>
<td>.35***</td>
<td>.32***</td>
<td>.53***</td>
<td>.22^*</td>
<td>.26**</td>
<td>.33***</td>
</tr>
</tbody>
</table>

^aWeight and shape concern scores represent a composite of selected items from the Weight Concern and Shape Concern subscales of the ChEDE. The items from the subscales used to calculate the correlations presented in this table are those items that were also used as indicator variables in model testing.

^bDue to significant skewness and kurtosis on these variables, transformed scores were used in the calculation of correlations.

*p < .05. **p < .01. ***p < .001.
6.4.3. Cross-sectional test of the model. As empirically demonstrated by previous research, and depicted by the solid in Figure 1, self-objectification has its effects on dietary restraint and depressed mood via body surveillance, body shame, and appearance anxiety. The model presented in Figure 1 therefore predicts that: (a) Self-Objectification will account for significant unique variance in Body Surveillance; (b) Body Surveillance will account for significant unique variance in Body Shame and Weight and Shape Concern; and (c) Body Shame and Weight and Shape Concern will account for significant unique variance in Dietary Restraint and Depressed Mood.

6.4.3.1. Measurement model. As described in Section 6.3.4.1, PCAs and CFAs of the OBC-Y, ChEDE, and short-form CDI were conducted to identify the items that accounted for the most variance in their respective factors. The identified items for Body Surveillance, Body Shame, Weight and Shape Concern, and Dietary Restraint were presented in Chapter 5 (Section 5.4.3.1.1). For Depressed Mood, CDI Items 1 (I am sad all the time), 2 (Things bother me all the time), and 6 (I feel alone all the time) were chosen as indicator variables as they met the requirements specified (i.e., high loading items, large percentage of variance accounted for in the latent factor, no cross-loadings with other factors). Bivariate correlations calculated between all indicators (inclusive of the indicators chosen for Depressed Mood) revealed that although many indicators of separate latent variables were significantly correlated ($r = .14 \text{ to } .38$), they did not reach .90, supporting the distinctiveness and unidimensionality of each latent variable. Coefficient $H$ for each latent construct equated to .71 for Body Surveillance, .77 for Body Shame, .90 for Weight and Shape Concern, .91 for Dietary Restraint, and .80 for Depressed Mood. These coefficients are adequate to excellent, supporting the reliability of the indicators (Hancock & Mueller, 2001).

When the measurement model was fitted to the data using CFA, a converged, admissible solution was obtained. The measurement model was a good fit to the
observed data with a nonsignificant chi-square, $\chi^2(105) = 110.31, p = .342$. All fit indices met the standards outlined for excellent fit ($\chi^2/df = 1.05$, CFI = 1.00, TLI = .99, RMSEA = .02, RMSEA 90% CI [.00, .04], WRMR = 0.64). Standardised and unstandardised factor loadings and unique errors associated with the observed variables are presented in Table 3. Each indicator loaded significantly and strongly on its specified latent factor. The majority of indicators had standardised factor loadings > .70 on their specified factor. No modification indices were suggested. This testing of the measurement model suggested that the indicators assumed to measure their hypothesised latent variable do indeed measure that latent variable and, as such, the measurement model is validated and estimation of the structural model may proceed.
Table 3

*Standardised and Unstandardised Factor Loadings and Unique Errors Associated With the Measurement Model*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Indicator</th>
<th>Mean (SD)</th>
<th>b'</th>
<th>b</th>
<th>SE</th>
<th>b/SE</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Objectification</td>
<td>SOQ</td>
<td>-12.37 (9.06)</td>
<td>0.96</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>OBCY1</td>
<td>0.74 (0.76)</td>
<td>0.61</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY4</td>
<td>0.58 (0.78)</td>
<td>0.58</td>
<td>0.95</td>
<td>0.17</td>
<td>5.74</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>OBCY6</td>
<td>0.58 (0.78)</td>
<td>0.74</td>
<td>1.21</td>
<td>0.18</td>
<td>6.63</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Shame</td>
<td>OBCY7</td>
<td>0.29 (0.59)</td>
<td>0.68</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBCY8</td>
<td>0.59 (0.76)</td>
<td>0.72</td>
<td>1.05</td>
<td>0.16</td>
<td>6.41</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>OBCY9</td>
<td>0.65 (0.81)</td>
<td>0.78</td>
<td>1.13</td>
<td>0.16</td>
<td>6.89</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Weight and Shape Conc.</td>
<td>Ch135</td>
<td>0.32 (0.99)</td>
<td>0.79</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ch142</td>
<td>0.53 (1.15)</td>
<td>0.88</td>
<td>1.10</td>
<td>0.08</td>
<td>13.06</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Ch143</td>
<td>0.41 (1.17)</td>
<td>0.77</td>
<td>0.97</td>
<td>0.08</td>
<td>12.49</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Ch146</td>
<td>0.54 (1.32)</td>
<td>0.86</td>
<td>1.09</td>
<td>0.08</td>
<td>14.47</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Dietary Restraint</td>
<td>Ch102</td>
<td>0.53 (1.35)</td>
<td>0.95</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ch105</td>
<td>0.05 (0.46)</td>
<td>0.75</td>
<td>0.79</td>
<td>0.14</td>
<td>5.62</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Ch106</td>
<td>0.25 (1.08)</td>
<td>0.61</td>
<td>0.64</td>
<td>0.16</td>
<td>4.00</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Depressed Mood</td>
<td>CDI1</td>
<td>0.14 (0.40)</td>
<td>0.43</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CDI2</td>
<td>0.30 (0.64)</td>
<td>0.46</td>
<td>1.07</td>
<td>0.46</td>
<td>2.31</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>CDI6</td>
<td>0.16 (0.41)</td>
<td>0.88</td>
<td>2.05</td>
<td>0.68</td>
<td>3.01</td>
<td>.003</td>
</tr>
</tbody>
</table>

*Note.* For identification purposes, one factor loading per latent variable was fixed to 1.00. These pathways were neither estimated nor tested.

### 6.4.3.2. Structural model

When the structural model was fitted to the data, a converged, admissible solution was obtained. The hypothesised model provided a good fit to the observed data with a nonsignificant chi-square, $\chi^2(112) = 119.54$, $p = .296$. All fit indices for this model met the standards outlined for excellent fit ($\chi^2/df = 1.07$, CFI = .99, TLI = .99, RMSEA = .02, RMSEA 90% CI [.00, .04], WRMR = 0.69) and the majority of residuals were small and centered around zero.
Individual elements of the model were examined next. Significant and positive direct effects were found between Self-Objectification and Body Surveillance, Body Surveillance and Body Shame, Body Surveillance and Weight and Shape Concern, Body Shame and Depressed Mood, and Weight and Shape Concern and Dietary Restraint. All significant pathways yielded medium to strong effects. Two key pathways within the model failed to reach significance: Body Shame to Dietary Restraint and Weight and Shape Concern to Depressed Mood. Standardised parameter estimates and standard errors for the structural model are presented in Figure 2. Unstandardised parameter estimates and standard errors for the structural model are presented in Table 4. Dietary Restraint and Depressed Mood did not significantly covary ($b = -0.01, SE = 0.06, p = .918; b' = -0.02, SE = 0.21, p = .918$).

Table 4

*Unstandardised Parameter Estimates and Standard Errors for the Structural Portion of the Model Under Investigation*

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Dependent variable</th>
<th>$b$</th>
<th>SE</th>
<th>$b$/SE</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Objectification</td>
<td>Body Surveillance</td>
<td>0.03</td>
<td>0.01</td>
<td>4.93</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Body Shame</td>
<td>0.93</td>
<td>0.17</td>
<td>5.55</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Surveillance</td>
<td>Weight and Shape Concern</td>
<td>0.96</td>
<td>0.15</td>
<td>6.46</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Body Shame</td>
<td>Dietary Restraint</td>
<td>0.15</td>
<td>0.19</td>
<td>0.81</td>
<td>.419</td>
</tr>
<tr>
<td>Body Shame</td>
<td>Depressed Mood</td>
<td>0.36</td>
<td>0.14</td>
<td>2.55</td>
<td>.011</td>
</tr>
<tr>
<td>Weight and Shape Concern</td>
<td>Dietary Restraint</td>
<td>0.56</td>
<td>0.16</td>
<td>3.60</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Weight and Shape Concern</td>
<td>Depressed Mood</td>
<td>0.04</td>
<td>0.09</td>
<td>0.45</td>
<td>.653</td>
</tr>
</tbody>
</table>

Self-Objectification accounted for 17% of the variance in Body Surveillance; Self-Objectification and Body Surveillance accounted for 64% of the variance in Body Shame and 50% of the variance in Weight and Shape Concern; and Self-Objectification,
Body Surveillance, Body Shame, and Weight and Shape Concern accounted for 28% of the variance in Dietary Restraint and 38% of the variance in Depressed Mood. No modification indices were suggested from the analysis.

Figure 2. Structural model (with standardised coefficients and standard errors) for the model under investigation. Broken lines represent residual (error) variances.

***p < .001.

The hypothesis that Body Shame and Weight and Shape Concern mediate the relationship between Body Surveillance and Dietary Restraint and Body Surveillance and Depressed Mood, was assessed by examining the indirect effects. As Body Shame did not influence Dietary Restraint and Weight and Shape Concern did not influence Depressed Mood, this study examined the specific indirect effect from Body Surveillance to Dietary Restraint via Weight and Shape Concern, and from Body Surveillance to Depressed Mood via Body Shame. The specific indirect effect of Body Surveillance on Dietary Restraint via Weight and Shape Concern was significant ($b = 0.54, b' = 0.33, z = 3.78, p < .001$). The specific indirect effect of Body Surveillance on Depressed Mood via Body Shame was also significant ($b = 0.33,$
Therefore, Weight and Shape Concern mediated the relationship between Body Surveillance and Dietary Restraint, whilst Body Shame mediated the relationship between Body Surveillance and Depressed Mood.

6.4.4. Longitudinal analyses.

6.4.4.1. Longitudinal measurement invariance. As described in Section 6.3.4.3.1, a multiple-group SEM approach was used to examine longitudinal measurement invariance of the model under investigation. As a preliminary analysis, the measurement model was assessed separately at each time point. The measurement model was an acceptable fit to the data at T1, $\chi^2(94) = 111.49, p = .105, \chi^2/df = 1.19, CFI = .97, TLI = .96, RMSEA = .03, \text{RMSEA 90\% CI [.00, .05]}, \text{WRMR = 0.74}$. It was also an acceptable fit to the data at T2, $\chi^2(94) = 135.32, p = .003, \chi^2/df = 1.44, CFI = .95, TLI = .94, \text{RMSEA = .05, 90\% CI [.03, .06]}, \text{WRMR = 0.77}$, and T3, $\chi^2(94) = 166.23, p < .001, \chi^2/df = 1.77, CFI = .92, TLI = .90, \text{RMSEA = .06, 90\% CI [.04, .07]}, \text{WRMR = 0.83}$. Additionally, inspection of the factor loadings at each time point revealed that each indicator loaded significantly on its specified latent variable. Given this consistency, formal testing could proceed.

First, a baseline model was specified in which all parameters were freely estimated across time. The first indicator of each latent factor was fixed to 1.00 and the factor means were fixed to 0 at each time point for identification purposes. The fit indices and model chi-square resulting from this specification are presented in Table 5. As can be seen, the model, with all parameters freely estimated across time, fit the data well, although the overall chi-square was significant. The central requirement that the same item must be an indicator of the same latent factor at each time point was met. As per T. A. Brown’s (2006) recommendations, the present study explored the possibility that differences found in tests of partial invariance may be an artefact of scaling the
metric of the latent factor with an indicator that has a different relationship to that factor across time. No differences in results were found.

Second, to test for metric invariance, the chi-square from the baseline model was compared to the chi-square from a model where only factor loadings were constrained to be equal across time. Fit indices and model chi-square from this constrained model are presented in Table 5. The metric invariance model was a significantly poorer fit to the data, $\chi^2(11) = 28.07, p = .003$. Consistent with Study 2b, inspection of the modification indices revealed that the indicator Ch142, hypothesised to load on Weight and Shape Concern, was problematic in terms of its equivalence over time (MI = 36.87). This parameter was therefore freely estimated and the metric invariance model compared once more to the baseline model. No difference in fit between the baseline model and this partially invariant metric invariance model was found, $\chi^2(10) = 12.97, p = .225$.

Given that only one indicator was found to be noninvariant over time, the degree of partial measurement invariance was sufficient to carry out further invariance analyses (see Chapter 5, Section 5.3.4.3.1). Scalar invariance was therefore examined. To test for scalar invariance, the chi-square from the baseline model was compared to a model where both factor loadings (with the exception of Ch142) and variable intercepts were constrained to be equal across time. Fit indices for this model are presented in Table 5. When the difference between this model and the baseline model was evaluated statistically, no significant difference in fit was found, $\chi^2(26) = 25.45, p = .494$. 
Table 5

Summary of Mplus Tests for Measurement Invariance Across Time

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2/df$</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA [90% CI]</th>
<th>WRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline</td>
<td>410.12</td>
<td>309</td>
<td>1.33</td>
<td>.96</td>
<td>.95</td>
<td>.04 [.03, .05]</td>
<td>1.43</td>
</tr>
<tr>
<td>2. Metric invariance</td>
<td>444.03</td>
<td>320</td>
<td>1.39</td>
<td>.95</td>
<td>.94</td>
<td>.04 [.03, .05]</td>
<td>1.57</td>
</tr>
<tr>
<td>3. Partial metric invariance</td>
<td>417.03</td>
<td>319</td>
<td>1.31</td>
<td>.96</td>
<td>.95</td>
<td>.04 [.03, .05]</td>
<td>1.49</td>
</tr>
<tr>
<td>(Ch142 freely estimated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Partial metric invariance and full scalar invariance</td>
<td>423.03</td>
<td>335</td>
<td>1.26</td>
<td>.96</td>
<td>.96</td>
<td>.04 [.02, .05]</td>
<td>1.51</td>
</tr>
</tbody>
</table>

Note. CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, WRMR = Weight Root Mean Square Residual.

The measurement invariance testing process indicated that the model under investigation met the criteria for configural invariance, partial metric invariance, and full scalar invariance. The structural portion of this model was examined next to evaluate changes in the structural paths of the model over time. With partial metric invariance and full scalar invariance specified, all structural paths were constrained to equality and compared to a baseline model in which these paths were freely estimated.

The baseline model provided an acceptable fit to the data, although chi-square was significant, $\chi^2(344) = 433.79, p < .001, \chi^2/df = 1.26, CFI = .96, TLI = .96, RMSEA = .04, RMSEA 90% CI [.02, .05], WRMR = 1.53$. The model in which all structural paths were constrained to equality provided a poorer overall fit to the data, $\chi^2(356) = 471.02, p < .001, \chi^2/df = 1.32, CFI = .95, TLI = .95, RMSEA = .04, RMSEA 90% CI [.03, .05], WRMR = 1.72$. The reduction in fit associated with the restricted model was significant, $\chi^2(12) = 30.46, p = .002$. Consistent with Study 2b, examination of modification indices revealed that the path between Weight and Shape Concern and
Dietary Restraint was particularly problematic (MI = 43.46). Freely estimating this parameter improved the overall fit of this model, $\chi^2(354) = 432.45$, $p = .003$, $\chi^2/df = 1.22$, CFI = .97, TLI = .97, RMSEA = .03 [90% CI .02, .04], WRMR = 1.58, and resulted in a nonsignificant chi-square difference test, $\chi^2(10) = 9.39$, $p = .495$. Examination of this structural path in more detail revealed that the association between Weight and Shape Concern and Dietary Restraint increased over time with standardised coefficients of 0.34, 0.67, 0.74 for T1, T2, and T3 respectively (unstandardised coefficients: 0.46, 1.26, 1.06).

6.4.4.2. Cross-lagged model. As described in Section 6.3.4.3, a cross-lagged model was created to prospectively examine the relationships between the variables of interest. The items used as indicators of T2 Body Shame, T2 Weight and Shape Concern, T3 Dietary Restraint, and T3 Depressed Mood were T2 and T3 versions of the items used in the cross-sectional test of the model.

When the cross-lagged model was fitted to the data, the model did not converge. Examination of the output revealed that the latent variable of T3 Depressed Mood was the source of this nonconvergence, with a correlation greater than 1 found between this variable and T2 Depressed Mood. Given the same set of indicator variables were used to assess both these constructs, the correlation between them may have been spuriously inflated as a result of shared method variance. Residual covariances between the indicators (i.e., T2 CDI1 with T3 CDI1, T2 CDI2 with T3 CDI2, and T2 CDI6 with T3 CDI6) were therefore specified and the model reexamined. When this respecified model was fitted to the data, a converged admissible solution was obtained. The model provided a poor fit to the data, with a significant chi-square, $\chi^2(381) = 599.87$, $p < .001$, and fit statistics that were suboptimal (CFI = .80, TLI = .77, SRMR = .09) to adequate (RMSEA = .05, RMSEA 90% CI [.04, .06], $\chi^2/df = 1.57$). The model accounted for 33% of the variance in T3 Dietary Restraint and 91% of the variance in T3 Depressed Mood.
Individual elements of the model were examined next. Unstandardised parameter estimates and standard errors for the structural model are presented in Table 6. Standardised parameter estimates and standard errors are presented in Figure 3.

Table 6

Unstandardised Parameter Estimates and Standard Errors for the Cross-Lagged Test of the Model

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Dependent variable</th>
<th>$b$</th>
<th>$SE$</th>
<th>$b/SE$</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Self-Objectification</td>
<td>T1 Body Surveillance</td>
<td>0.02</td>
<td>0.01</td>
<td>3.41</td>
<td>.001</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Body Shame</td>
<td>0.19</td>
<td>0.14</td>
<td>1.30</td>
<td>.193</td>
</tr>
<tr>
<td>T1 Body Shame</td>
<td>T2 Body Shame</td>
<td>0.57</td>
<td>0.28</td>
<td>2.03</td>
<td>.042</td>
</tr>
<tr>
<td>T1 Body Surveillance</td>
<td>T2 Weight and Shape</td>
<td>0.10</td>
<td>0.17</td>
<td>0.62</td>
<td>.533</td>
</tr>
<tr>
<td>T1 Weight and Shape</td>
<td>T2 Weight and Shape</td>
<td>0.76</td>
<td>0.20</td>
<td>3.87</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Concern</td>
<td>T3 Weight and Shape</td>
<td>-0.17</td>
<td>0.32</td>
<td>-0.53</td>
<td>.593</td>
</tr>
<tr>
<td>Concern</td>
<td>T3 Dietary Restraint</td>
<td>1.30</td>
<td>0.49</td>
<td>2.66</td>
<td>.008</td>
</tr>
<tr>
<td>T2 Body Shame</td>
<td>T3 Dietary Restraint</td>
<td>0.37</td>
<td>0.27</td>
<td>1.41</td>
<td>.159</td>
</tr>
<tr>
<td>T2 Dietary Restraint</td>
<td>T3 Depressed Mood</td>
<td>0.01</td>
<td>0.03</td>
<td>0.29</td>
<td>.769</td>
</tr>
<tr>
<td>T2 Weight and Shape</td>
<td>T3 Depressed Mood</td>
<td>0.04</td>
<td>0.11</td>
<td>0.35</td>
<td>.729</td>
</tr>
<tr>
<td>Concern</td>
<td>T3 Depressed Mood</td>
<td>0.57</td>
<td>0.19</td>
<td>2.95</td>
<td>.003</td>
</tr>
</tbody>
</table>

Of the key causal relationships of interest, only the relationship between T2 Body Shame and T3 Dietary Restraint emerged as significant. However, consistent with Study 2b, unspecified covariances revealed significant covariation between T1 Body Shame and T2 Dietary Restraint, and between T1 Weight and Shape Concern and T2 Dietary Restraint. Significant covariation was also found between T1 Body Shame and T2 Depressed Mood. The expected causal relationships between these variables were
specified one at a time and the model estimated. These respecifications revealed that T1 Weight and Shape Concern \((b = 0.83, SE = 0.31, p = .007, b' = 0.60, SE = 0.17, p < .001)\) and T1 Body Shame \((b = 1.59, SE = 1.01, p = .114, b' = 0.45, SE = 0.18, p = .012)\) significantly predicted T2 Dietary Restraint, and T1 Body Shame significantly predicted T2 Depressed Mood \((b = 0.32, SE = 0.14, p = .026, b' = 0.43, SE = 0.17, p = .012)\).

Modification indices recommended the specification of cross-sectional relationships between T1 Body Surveillance and T1 Weight and Shape Concern and between T2 Weight and Shape Concern and T2 Dietary Restraint. However, as the present analysis was concerned with only prospective relationships, these modifications were not implemented. Consistent with Study 2b, modification indices reversing several relationships were also recommended. For example, paths from T1 Body Shame to T1 Body Surveillance, from T1 Weight and Shape Concern to T1 Body Surveillance, and from T2 Dietary Restraint to T2 Weight and Shape Concern were recommended. Although the inclusion of these paths makes theoretical sense (as described in detail in Section 6.5), these paths were not specified as their estimation would have led to the creation of a nonrecursive model and resulted in identification problems.
6.4.5. Gender differences. To clarify the nature of gender differences within the model, gender differences in the associations between the variables posited by objectification theory were examined. As gender differences were explored in Study 2b (Section 5.4.5), multiple regression analyses were conducted to explore which of the variables specified by objectification theory may interact with gender to predict depressed mood only. Prior levels of depressed mood were controlled for in longitudinal analyses.
Using a Bonferroni-adjusted significance level of .0125 to control for the familywise error rate, gender was found to significantly moderate the prospective relationship between T2 body shame and T3 depressed mood, $F(4, 212) = 771.22$, $p < .001$; $F_{\text{change}}(1, 212) = 17.13$, $p < .001$; $R^2_{\text{change}} = .01$, $b = 0.06$, $SE = 0.01$, $\beta = .13$, $p < .001$. This interaction was probed using the procedure outlined by Holmbeck (2002). Results are summarised in Figure 4. The association between T2 body shame and T3 depressed mood, controlling for the effects of T2 depressed mood, was significant in girls, $t(212) = 9.14$, $p < .001$, but not in boys, $t(212) = 1.66$, $p = .099$.

Figure 4. Regression lines for relations between T2 body shame and T3 depressed mood, as moderated by gender, using proportionally weighted composite scores and controlling for T2 depressed mood.

***$p < .001$. 
6.5. Discussion

The present study sought to cross-sectionally and prospectively examine objectification theory as it pertains to the development of dietary restraint and depressed mood in children. It was hypothesised that the causal model depicted by the solid lines in Figure 1 would provide a good cross-sectional fit to the observed data. This hypothesis was supported, with the model providing an excellent fit to the data in cross-sectional analyses. Additionally, the predictive utility of this model was adequate. Self-Objectification, Body Surveillance, Body Shame, and Weight and Shape Concern accounted for a greater proportion of the variance in Depressed Mood than Dietary Restraint. Consistent with the pathways hypothesised by objectification theory, Self-Objectification accounted for significant unique variance in Body Surveillance, and Body Surveillance accounted for significant unique variance in Body Shame and Weight and Shape Concern. The final pathways to Dietary Restraint and Depressed Mood differed. Specifically, Body Shame accounted for significant unique variance in Depressed Mood, whereas Weight and Shape Concern accounted for significant unique variance in Dietary Restraint. Consistent with Study 2b, and the results of Tiggemann and Kuring (2004) and Tiggemann and Williams (2012), the path from Weight and Shape Concern to Dietary Restraint was stronger than the path from Body Shame to Dietary Restraint.

The finding that Weight and Shape Concern did not account for significant unique variance in Depressed Mood stands in contrast to Tiggemann and Kuring (2004). This may be a result of the operationalisation of appearance anxiety used in the present study. As validated scales assessing appearance anxiety in children have yet to be developed, the present study utilised items from the Weight and Shape Concern subscales of the ChEDE as indicators of appearance anxiety. By contrast, Tiggemann and Kuring (2004) utilised the Appearance Anxiety Scale, created by Dion, Dion, and
Keelan (1990). Although weight and shape concern is similar to appearance anxiety, the use of different measuring instruments across studies may nevertheless have contributed to the varied results. For example, examination of the Appearance Anxiety Scale reveals that the scale focuses on appearance more broadly (e.g., *I feel nervous about aspects of my physical appearance, I would like to change the way I look, I wish I were better looking, I feel comfortable with my facial attractiveness*) as opposed to weight and shape specifically. This broader conceptualisation of appearance, and the inclusion of items that assess physical features that cannot easily be changed (e.g., facial attractiveness), may have contributed to a significant result being found between this variable and depressed mood by Tiggemann and Kuring (2004) but not by the present study.

With the exception of this nonsignificant relationship, and the nonsignificant relationship between Body Shame and Dietary Restraint (discussed in detail in Study 2b), all other investigated associations were consistent with those noted among early adolescents (Grabe et al., 2007), undergraduates (Tiggemann & Kuring, 2004; Tiggemann & Williams, 2012), and other adults (Szymanski & Henning, 2007), suggesting that the associations posited by objectification theory are already apparent in children as young as 6 years of age.

Although cross-sectional analyses provided some support for objectification theory as it pertains to the development of dietary restraint and depressed mood in children, the primary purpose of the present study was to prospectively examine these relationships. Measurement invariance testing revealed that the structural portion of the model remained fairly stable over time. That is, as children got older, the expected relationships between the variables posited by objectification theory remained significant. As discussed in Study 2b, however, the relationship between Weight and
Shape Concern and Dietary Restraint significantly increased over time. This finding has been discussed in the previous chapter and will not be discussed further here.

The cross-lagged test of the model did not provide a good fit to the data. Although some of the fit indices suggested adequate fit, the majority were suboptimal. Additionally, although the predictive utility of the model in accounting for Depressed Mood was high (accounting for over 90% of the variance), this variance was predominantly accounted for by the control variable of T2 Depressed Mood, which was the only specified variable to significantly and prospectively predict T3 Depressed Mood. Modification indices and subsequent analysis of these indices, however, supported the existence of prospective relationships that were not specified explicitly within the model. Specifically, T1 Body Shame was found to significantly predict T2 Depressed Mood, suggesting that this relationship may indeed be supported prospectively, depending on the age of the participants under investigation. Specifically, body shame may predict the development of depressed mood at a particular stage of development, after which body shame may contribute to the maintenance, not development, of depressed mood. Given the mean age of participants at T1 and T2, the predictive utility of body shame with regard to depressed mood appears to be strongest between the ages of 8 and 9 years. As with Study 2b, however, these conclusions are based on results from modification indices that may be idiosyncratic to the present sample. Replication is therefore needed.

As results pertaining to Dietary Restraint in the cross-lagged test of the model are identical to those reported in Study 2b, these are not repeated. Briefly, with the inclusion of Depressed Mood in the model, Body Shame remained a significant prospective predictor of Dietary Restraint and modification indices again posited several reciprocal relationships between the variables under investigation.
Given the significant comorbidity between eating disorders and depression found in previous research, the present study sought to examine the relationship between disordered eating and depressed mood within the objectification theory framework. Dietary Restraint and Depressed Mood did not significantly covary in both the cross-sectional and cross-lagged models under investigation. This result stands in contrast to recent findings of comorbidity by Hudson et al. (2007), Jordan et al. (2008), and Blinder et al. (2006), and to research in children indicating that higher rates of depression are predictive of higher eating disorder scores in boys and girls (R. M. Gardner et al., 2000).

As detailed in Chapter 5 (Section 5.5), it is important to recognise the nature of the measure used in the assessment of eating disorder symptomatology in the present study when interpreting the aforementioned findings. Specifically, the present study operationalised eating disorder symptomatology as dietary restraint and used items on the Restraint subscale of the ChEDE as indicator variables of this construct. By contrast, previous researchers have used full clinical interviews or the Eating Disorder Inventory (D. M. Garner et al., 1983) to assess for eating disorder symptomatology. These measures assess the symptoms of eating disorders more broadly, including affective and cognitive factors. It is therefore possible that the present study’s operationalisation of eating disorder symptomatology as dietary restraint meant this variable did not correlate significantly with depressed mood because dietary restraint is predominantly behavioural and depressed mood is cognitive-affective.

In support of this, previous research by Kostanski and Gullone (1999) found that although a significant relationship exists between body image dissatisfaction and dieting, the correlation between these two constructs is low overall. They suggested that body image dissatisfaction and dieting are largely disparate concepts, with body image dissatisfaction representing the internalisation of negative cognitions about the self, and
dieting representing the adoption of restrictive eating behaviours. A similar distinction between depressed mood and dietary restraint may have been present in the current study, with depressed mood representing negative cognitions about the self, the world, and others, and dietary restraint representing the adoption of weight-loss behaviours. Perhaps if the present study operationalised eating disorder symptomatology more broadly and included the cognitive components of eating disorders (e.g., fear of fatness, fear of weight gain) in addition to the behavioural components of eating disorders (e.g., dietary restraint, binge eating), a significant relationship would have been found.

It is also possible that depressed mood interacts with body shame and/or weight and shape concern to produce eating disorder symptoms, as opposed to influencing the development of eating disorder symptoms directly. As discussed by Sinton and Birch (2006), negative mood may be associated with a general cognitive bias that may lead individuals to (a) perceive their bodies as less than ideal and (b) value and internalise messages that reinforce this belief. Future research examining the possibility of an interaction between depressed mood, weight and shape concern, and body shame is likely to be informative.

The final aim of this study was to examine possible gender differences within the model under investigation. It was hypothesised that the nature of the relationships posited by objectification theory would not differ between boys and girls. This hypothesis was partially supported, with an examination of gender interaction terms revealing a significantly stronger association between T2 Body Shame and T3 Depressed Mood in girls than in boys. Indeed, this association failed to reach significance in boys. This indicates that body shame exerts a differential risk for girls and boys, and suggests that the utility of objectification theory as it pertains to the development of depressed mood in boys may be limited. Specifically, the socialisation that leads girls to habitually monitor their bodies and, in turn, experience negative
psychological consequences and depressive symptomatology, does not appear to be relevant in boys.

6.5.1. Limitations. The present study had some limitations that need to be taken into account when interpreting the findings. Several of the limitations were discussed in detail in Study 2b (Chapter 5, Section 5.5.1). These included the possibility of bias introduced as a result of self-report, the sample size precluding the use of multiple-group analysis and therefore restricting the examination of gender differences, the low reliability of the dietary restraint variable, the use of only three assessment points precluding all pathways from being specified prospectively, and the lack of experimental manipulation limiting the confidence that can be placed in the causal inferences. Another limitation concerns the operationalisation of the latent constructs of Weight and Shape Concern and Dietary Restraint. As discussed above in Section 6.5, the measures utilised in this study may have influenced the study’s results. Specifically, it is possible that the nonsignificant cross-sectional relationship between Weight and Shape Concern and Depressed Mood, the absence of prospective predictors of Depressed Mood, and the poor fit associated with the cross-lagged test of the model, may have emerged because (a) the Weight and Shape Concern subscales of the ChEDE were used as indicators of appearance anxiety and (b) eating disorder symptomatology was operationalised specifically as dietary restraint. The development of a validated measure of appearance anxiety in children, and a measure of eating disorder psychopathology that encompasses a broader range of symptoms (e.g., the Global ChEDE score), is needed to further this line of research.

A final limitation is that fit statistics for the cross-lagged model were far from excellent, and only one of the key relationships posited by objectification theory emerged as significant prospectively. Future studies should perhaps consider the development and examination of a model that better accounts for the development of
depressed mood in children. Specifically, as discussed in Chapter 5 (Section 5.5.2), it is important for researchers to consider the possibility that other models exist that provide a better fit to the data, or that fit the data equally well. The inclusion of other, more general, risk factors for depression (such as negative affectivity) to specifically test the hypothesis that self-objectification and its negative psychological consequences act as risk factors that operate in addition to these more general risk factors is necessary. Incorporation of these general risk variables within the objectification theory framework would help advance this research further. Additionally, a thorough examination of individual variables such as internalisation of the thin-ideal and self-objectification, in the context of randomised prevention trials, may further clarify the role of these variables in the development of eating disorders and depression.

6.5.2. Strengths. Despite the aforementioned limitations, this study had several strengths. Several of these strengths were described in Study 2b (Chapter 5, Section 5.5.2). These included the use of one–on–one interviews allowing the assessment process to be appropriate for children of all ages, and the use of a more sophisticated methodology for the analysis of the model under investigation. One strength specific to the present study, however, is that it appears to be the first to prospectively evaluate the validity of objectification theory as it pertains to the development of both eating disorder symptoms and depressed mood in children. As described in Study 2b, the use of children, rather than adolescents, allowed for the development of body-related concerns to be assessed prior to their manifestation. Additionally, the inclusion of both boys and girls in the present sample allowed gender differences in the degree of association between the variables posited by objectification theory to be considered.

6.5.3. Conclusion. Given that depression and eating disorders are conceptualised as potential causal outcomes of self-objectification, habitual body monitoring, body shame, and appearance anxiety, the present study sought to examine
an extended model of objectification theory by evaluating the hypothesised contribution and etiological significance of self-objectification in the development of both dietary restraint and depressed mood in children. Results suggest that the affective processes (i.e., body shame) surrounding children’s psychological investment in their appearance are important in the maintenance of depression, whilst the cognitive processes (i.e., weight and shape concern) are important in the maintenance of eating disturbances. The affective processes surrounding children’s investment in their appearance also appear to be important in the development of eating disturbances. These results provide several malleable risk factors that might be targeted in prevention efforts (discussed in detail in Chapter 9).

Studies 2a to 2c of this thesis have focused specifically on risk factors of disordered eating and depressed mood. It is important, however, to go beyond the risk factors and start investigating possible mechanisms of change within these models that may serve to decrease the associations between the pathways of interest and, ultimately, decrease the incidence of dietary restraint and depressed mood in boys and girls. One such mechanism of change, self-esteem, is examined in the next chapter.
Chapter 7. Study 2d: Protective Factors Within the Objectification Theory Framework: The Role of Self-Esteem

7.1. Overview

Studies 2b and 2c concluded that self-objectification plays a role in the development of body image disturbance, eating disorder symptomatology, and depression in boys and girls. Considerably less research, however, has focused on the influence of self-objectification on psychological well-being more broadly. Additionally, the identification and exploration of factors that may protect children from the development of self-objectification and its negative psychological consequences remains largely under-researched (Littleton & Ollendick, 2003). Accordingly, the present study examined one indicator of psychological well-being, self-esteem, focusing on (a) the role of self-objectification in the development of low self-esteem, and (b) the role of self-esteem as a protective factor within the framework of objectification theory.

7.2. Introduction

Self-esteem refers to the personal judgement of overall self-worth and adequacy, and the feelings associated with that judgement (Lyubomirsky, Tkach, & DiMatteo, 2006; Mercurio & Landry, 2008; Ricciardelli & McCabe, 2004). It is considered an important indicator of psychological well-being (Lyubomirsky et al., 2006) and is fundamental to mental health. High self-esteem (or a highly favourable global evaluation of the self; Baumeister, Campbell, Krueger, & Vohs, 2003) is considered a protective factor that promotes adaptive behaviours and cognitions through its role as a buffer against the impact of negative influences (Mann, Hosman, Schaalma, & De Vries, 2004). By contrast, low self-esteem reflects a less favourable global evaluation of the self (Baumeister et al., 2003).

According to Berk (2000), self-esteem is one of the most important aspects of self-development in children, affecting their emotional experiences, behaviour, and
long-term psychological adjustment. Research suggests that low self-esteem affects a significant proportion of children. For example, in a study by McGee, Williams, and Nada-Raja (2001), approximately 18% of 9- to 13-year-old boys and girls reported low self-esteem. In particular subgroups of children, the prevalence of low self-esteem may be higher. For example, previous research has found that overweight children report significantly lower levels of self-esteem than healthy-weight children (Burrows & Cooper, 2002; Davison & Birch, 2001; Franklin et al., 2006; Smeesters, Mussweiler, & Mandel, 2010). In a study of 9- to 14-year-olds by Franklin et al. (2006), low global self-worth was reported by 4.5% of healthy-weight children and 24.5% of overweight or obese children. These findings suggest that overweight children may be particularly at risk of experiencing poorer long-term psychological adjustment.

Although low self-esteem is maladaptive in its own right and should be studied in addition to more prominent indicators of psychological distress, it has also been linked to a variety of psychopathology. Of particular interest to the present study is the well-established relationship between self-esteem, body image disturbance, and eating disorder symptomatology. The mechanisms underlying the relationship between self-esteem, body image disturbance, and eating disorder symptomatology have been the subject of many investigations. Several researchers state that as a result of the importance Western society and the mass media place on appearance, individuals—especially females—have been socialised to believe that appearance is a basis for self-evaluation and therefore equate their self-worth with their appearance (Stice, Hayward, et al., 2000; Strahan et al., 2008; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). As described in Chapter 2 (Section 2.4.4.1), appearance ideals exist in the context of an environment where cultural scripts equate thinness, beauty, and attractiveness with success, desirability, status, popularity, superiority, and happiness (Harrison, 2000; C. Johnson et al., 1987; Levine et al., 1999; Paxton et al., 1991; Striegel-Moore et al.,
1986; Tiggemann, 2005a). These scripts are reinforced by the negative societal attitudes and stigma directed towards overweight and obese individuals, including children (Puhl & Brownell, 2001; Puhl & Latner, 2007). Acceptance of these scripts (i.e., acceptance of the belief that appearance and thinness are vital for happiness) means that self-worth becomes equated with perceived attractiveness (Tiggemann, 2002). The link between self-worth and physical appearance therefore makes body image central to self-definition (Clay, Vignoles, & Dittmar, 2005).

There is growing empirical support for the proposition that idealised portrayals of males and females in Western society negatively influence self-esteem in adults and self-evaluation and developing self-concept in children (Clay et al., 2005; Dittmar et al., 2006). However, the opposite has also been suggested, with low self-esteem and a compromised self-concept thought to make individuals, particularly girls, more likely to be influenced by societal messages (Vartanian, 2009). Specifically, low self-esteem is thought to facilitate a belief in the importance of appearance, thinness, and beauty, which may make individuals more vulnerable to cultural messages of appearance, and more likely to internalise sociocultural standards, therefore heightening vulnerability to body dissatisfaction (Durkin, Paxton, & Sorbello, 2007). The relationship between self-esteem, body image, and cultural standards of appearance is therefore likely to be reciprocal in nature: body image disturbance leads to low self-esteem and low self-esteem makes individuals more likely to be influenced by societal messages regarding thinness and beauty. Responsiveness to these cultural messages may, in turn, increase the likelihood of experiencing body image disturbance.

Just as internalisation of cultural attitudes towards appearance may contribute to the development of low self-esteem (Clay et al., 2005), internalisation of the self as an object may also have a negative impact on self-worth. According to Fredrickson and Roberts (1997), a female’s sense of self is largely dependent on how she feels about her
body. Females who self-objectify and, therefore, see their bodies as objects that exist solely for the pleasure and evaluation of others, may have a particularly poor sense of their self-worth as reflected in poor self-esteem. Thus, although the original formulation of objectification theory focused on the associated mental health risks of eating disorders and depression, the experience of self-objectification might also have broader implications for psychological well-being generally and self-evaluation specifically.

Consistent with this idea, a significant negative association between self-objectification, its psychological consequences, and self-esteem has been documented among US and Australian females (Befort et al., 2001; Lowery et al., 2005; Mercurio & Landry, 2008; Strelan et al., 2003; Tolman, Impett, Tracy, & Michael, 2006). Overall, these studies found that body-related experiences, such as self-objectification and body surveillance, may have important consequences for psychological well-being, which may have further implications for individual vulnerability to psychopathology (e.g., Noll & Fredrickson, 1998; Tiggemann & Kuring, 2004). Although these findings are consistent across genders (Choma et al., 2010), gender differences in self-esteem are evident, with the majority of studies reporting that males (including young boys) experience significantly higher levels of self-esteem than females (Franklin et al., 2006; Frost & McKelvie, 2004; Kostanski & Gullone, 1998; Kozee et al., 2007; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991).

There are, however, several limitations affecting previous investigations. First, with only one exception (Strelan et al., 2003), these investigations did not explicitly measure self-objectification. Rather, its manifest, body surveillance, was used as a proxy measure of self-objectification. Although the Strelan et al. (2003) study did explicitly assess self-objectification, as with the other studies it was cross-sectional in design, meaning the direction of the relationship between self-objectification and self-esteem could not be determined. In a study of female undergraduates by Tylka and
Sabik (2010), those with low self-esteem were more likely to engage in body surveillance and experience body shame than those with high self-esteem, suggesting that there may be a reciprocal relationship between self-esteem and the variables posited by objectification theory. The longitudinal examination of the relationship between self-objectification and self-esteem is therefore important.

Second, despite the suggestion by Wood et al. (1996) that poor body image will likely impact on self-concept and self-esteem in childhood, there appear to have been no investigations of self-esteem and the variables posited by objectification theory conducted in children. An investigation of this nature is imperative, given that physical appearance is one of the most concrete means by which an individual can be described, and body image may therefore be the first characteristic children perceive as part of their developing self-concept (Wood et al., 1996).

Finally, although self-esteem has been identified as a buffer that may serve to moderate the link between self-objectification and its negative psychological consequences (Breines, Crocker, & Garcia, 2008; Thøgersen-Ntoumani, Ntoumanis, Cumming, Bartholomew, & Pearce, 2011), a thorough investigation of this relationship has not been conducted. However, in a study by Moradi and Subich (2004) on female undergraduates, self-esteem was found to moderate the relationship between sexist events (e.g., unwanted sexual advances) and psychological distress. Specifically, the association between sexist events and psychological distress was significant only in participants with low self-esteem. Given that sexist events are considered a form of sexual objectification (Fredrickson & Roberts, 1997), it is within reason to suggest from this research that high self-esteem may serve a protective function, moderating the relationship between the variables posited by objectification theory. Conversely, low self-esteem may serve as a potential risk factor, increasing vulnerability to the psychological consequences posited by objectification theory.
Previous research in the area of eating disorders and body image disturbance supports both of these possibilities. In a prospective study of women by Ghaderi and Scott (2001), participants who developed an eating disorder had significantly lower levels of baseline self-esteem than participants who did not develop an eating disorder. Significant cross-sectional and prospective support also exists for the role of low self-esteem as a factor that heightens vulnerability to body image disturbance (Joiner & Kashubeck, 1996; Kostanski & Gullone, 1998; Kozee et al., 2007; Ozmen et al., 2007; Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006; Tiggemann & Wilson-Barrett, 1998), although the exact directional nature of the relationship is unclear. In a 5-year prospective study of early adolescent girls, Paxton et al. (2006) identified self-esteem as a risk factor for body dissatisfaction. By contrast, in a prospective study of adolescents by Tiggemann (2005a), no evidence for the causal role of self-esteem in the development of adolescent body dissatisfaction was found. Weight satisfaction, however, was found to temporally precede self-esteem, supporting previous research by Verkuyten (1990) that identified body image satisfaction as the single greatest predictor of self-esteem in adolescents of different ethnicities. In various studies of children, those who reported higher levels of body dissatisfaction and body image concerns also reported lower global self-worth and poorer self-esteem (e.g., Lawrence & Thelen, 1995; Mendelson, White, & Mendelson, 1996).

The role of self-esteem as a protective factor has also been supported. In a study of early adolescents by Ricciardelli and McCabe (2001b), boys and girls with high self-esteem were less likely to engage in body change strategies to increase muscles than boys and girls with low self-esteem. In a study of 8- to 12-year-olds by Mendelson et al. (1996), children with higher levels of self-worth had more positive feelings about their appearance and their weight. These findings have been supported more recently by
Shaw, Stice, and Springer (2004), who found that high levels of self-esteem prospectively predicted low levels of bulimic symptoms in adolescent girls.

**7.2.1. Present study.** Research examining the relationship between self-esteem, body image disturbance, and eating disorder symptomatology has not resulted in a conclusive understanding of the nature of the relationship between these constructs, particularly in children. There is also limited research connecting self-esteem with the variables involved in objectification theory. Finally, little is known about the role of protective factors in the development of body image disturbance generally, as past researchers have focused predominantly on potential risk factors (Crago, Shisslak, & Ruble, 2001). Although several protective factors have been postulated (e.g., positive family relationships, positive social relationships, participation in organised sports, school environments that foster acceptance of all body types, coping ability, self-esteem, self-efficacy, life skills; Crago et al., 2001; Littleton & Ollendick, 2003), only a few have been fully evaluated (positive family relationships, participation in organised sports; Crago et al., 2001; Littleton & Ollendick, 2003). There is therefore a need to move beyond the identification of risk factors for eating disorder symptomatology, and identify and articulatevariables that not only enhance well-being, but also protect individuals from experiencing body image disturbance and engaging in maladaptive weight-loss behaviours. Indeed, the mounting evidence of self-objectification’s negative psychological consequences makes the investigation of variables that may counter its impact important. The understanding of which variables weaken the relationships posited by objectification theory may help inform prevention programs that can then be tailored towards promoting variables that weaken the posited relationships and ameliorating those that strengthen the posited relationships.

Accordingly, the present study sought to examine whether self-esteem serves as a protective variable that moderates the strength of the putative risk factors of body
image disturbance and eating disorder symptomatology. Given an important, yet neglected, area of study on objectification theory is the examination of the effects of self-objectification on overall psychological well-being, this study also moved beyond investigating the role of self-objectification in the development of body image disturbance and eating disorder symptomatology towards an examination of the influence of self-objectification on overall feelings of self-worth. Specifically, the primary aims of this study were to cross-sectionally and prospectively examine (a) the role of self-objectification and its negative psychological consequences in the development of low self-esteem, (b) the predictive utility of self-esteem in the development of self-objectification and its negative psychological consequences, and (c) the role of self-esteem as a protective factor within the framework of objectification theory. A secondary aim of this study was to examine gender and weight category differences in self-esteem, as well as changes in self-esteem over time. It was hypothesised that:

1. A reciprocal relationship exists between self-esteem and self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood.

2. Self-esteem would act as a protective factor and moderate the relationships posited by objectification theory. Specifically, self-esteem would act as a buffer, weakening the effect of the predictor variable on the outcome variable under investigation. Given the paucity of previous research, the ability of self-esteem to buffer all pathways posited by objectification theory was examined.

3. Given findings of previous research, overweight children would report lower levels of self-esteem than healthy-weight children (Burrows & Cooper, 2002; Davison & Birch, 2001; Smeesters et al., 2010), and girls would report lower
levels of self-esteem than boys (Franklin et al., 2006; Frost & McKelvie, 2004; Kostanski & Gullone, 1998; Kozee et al., 2007; Wigfield et al., 1991).

7.3. Method

7.3.1. Design. As with Studies 2a to 2c, this study was longitudinal in nature with information utilised from three assessment points: baseline (Time 1; T1), 1-year follow-up (Time 2; T2), and 2-year follow-up (Time 3; T3). Analyses were cross-sectional and longitudinal.

7.3.2. Participants and recruitment procedures. This research involved the same sample of children utilised in Studies 2a to 2c (N = 253, 109 boys and 144 girls). As recruitment details, participant characteristics, and assessment protocols are identical to those reported in the earlier chapters (see Sections 4.3.2, 4.3.3, and 4.3.4), this information is not repeated here. Present analyses involved only those participants who provided data at all three assessment points (n = 219, 94 boys and 125 girls). These participants ranged in age from 6 to 11 years (M = 8.37, SD = 1.43).

7.3.3. Measures. As there is overlap between the measures used in Studies 2a to 2c and those utilised in this research, only a brief summary of these measures is repeated below. More detailed information is provided for scales not previously introduced.

7.3.3.1. Weight and height. As noted in Chapter 3 (Section 3.3.3.1), participants were weighed and measured in light clothing and without shoes. Age- and gender-specific body mass index z-scores (BMI z-scores) were calculated using the Center for Disease Control 2000 reference growth charts (Ogden et al., 2002). Weight category was calculated and defined using the T. J. Cole et al. (2000) international age- and gender-specific BMI cutoffs for categorising children as healthy-weight, overweight, or
obese. Given the relatively small proportion of overweight and obese children in the present sample, these categories were collapsed.

7.3.3.2. Self-objectification. Self-objectification was assessed using the Modified Self-Objectification Questionnaire (SOQ), introduced and described in Chapter 3 (Section 3.3.3.3).

7.3.3.3. Body surveillance and body shame. Body surveillance and body shame were assessed using the 4-item Body Surveillance subscale and 5-item Body Shame subscale of the Modified Objectified Body Consciousness Scale for Youth (OBC-Y), introduced and described in Chapter 3 (Section 3.3.3.2).

7.3.3.4. Body dissatisfaction. Body dissatisfaction was assessed using the Children’s Body Image Scale (CBIS; Truby & Paxton, 2002), introduced and described in Chapter 4 (Section 4.3.3.3).

7.3.3.5. Weight and shape concern and dietary restraint. Weight and shape concern and dietary restraint were assessed using the Children’s Eating Disorder Examination (ChEDE; Bryant-Waugh et al., 1996), introduced and described in Chapter 4 (Section 4.3.3.5). Specifically, the subscales of Weight Concern, Shape Concern, and Restraint were used as measures of cognitive and behavioural eating disorder symptoms in the present study. Whilst dietary restraint was calculated by averaging all items on the Restraint subscale (as recommended by Fairburn et al., 2008), weight and shape concern was calculated by averaging eight items from both the Weight and Shape Concern subscales of the ChEDE that were found by previous researchers (Allen, Byrne, Lampard, Watson, & Fursland, 2011; S. M. Byrne et al., 2010; Wade et al., 2008) and the candidate (see Appendix A) to be the most reliable in their assessment of cognitive eating disorder symptoms.
**7.3.3.6. Depressed mood.** Depressed mood was assessed using the short-form Children’s Depression Inventory (CDI; Kovacs, 1985), introduced and described in Chapter 6 (Section 6.3.3.4).

**7.3.3.7. Self-esteem.** Self-esteem was assessed using the Self-Concept Inventory of the Beck Youth Inventory (BYI; J. S. Beck et al., 2001). Self-esteem is the evaluative and affective dimension of self-concept, and is considered equivalent to self-regard and self-worth (Harter, 1999). The inventory contains 20 statements that represent an individual’s perceptions about their self-competence and self-worth (e.g., I am just as good as the other kids). Participants were asked to listen to each sentence carefully and then say aloud the response that best described how they felt about themselves during the preceding two weeks. Participants responded to each statement using a 4-point scale that ranged from 0 (Never) to 3 (Always). A total score was calculated by summing the 20 items, thus scores ranged from 0 to 60, with higher scores indicative of positive self-concept. Once total scores were calculated, they were transformed into age- and gender-standardised t-scores provided in the BYI manual. Participants were then classified as having above average, average, lower than average, or much lower than average self-esteem according to the cutoffs provided by J. S. Beck et al. (2001).

The Self-Concept Inventory was chosen as a measure of self-esteem as it is brief and easy to administer without sacrificing reliability and validity. The psychometric properties of the Beck Youth Inventories have been reported for a nationally drawn, standardisation sample of 800 US school children, along with a sample of 89 children with special needs and a sample of 107 children who were evaluated for outpatient psychiatric services (J. S. Beck et al., 2001; R. A. Steer, Kumar, Beck, & Beck, 2005). The internal consistency of the inventory was high in each of these samples (Cronbach’s \( \alpha > .85 \)). For the present sample, internal consistency (calculated using the more
accurate ordinal coefficient alpha described in Chapter 3, Section 3.3.5.2) was .85 overall, .85 for girls, and .83 for boys.

7.3.4. Statistical analysis. To address the primary aims of the present study, hierarchical multiple linear regression models were created to identify whether self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood were cross-sectional and prospective predictors of self-esteem, and whether self-esteem was a cross-sectional and prospective predictor of self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood. Although structural equation modelling could have been implemented to assess the role of self-esteem within the objectification theory framework, an overall test of the objectification theory framework with the inclusion of self-esteem was not of interest to this study. Rather, of primary interest was the relationship between self-esteem and each of the variables posited by objectification theory. Furthermore, given the sample size of the present study, it is likely that the inclusion of another variable in the model would have resulted in an underpowered structural analysis.

For longitudinal analyses, prior levels of the dependent variable under investigation were controlled for at Step 1, with all other predictor variables entered at Step 2. In cross-sectional and prospective analyses where self-esteem was the dependent variable, regression analyses were accomplished in two steps. First, separate univariate regression analyses were conducted for each possible predictor of self-esteem to avoid any complications due to multicollinearity (Stice & Whitenton, 2002). In the second step, significant univariate predictors were included in a simultaneous multivariate regression model to determine the unique contribution of each significant predictor.

Where self-esteem was treated as a categorical variable (above average, average, lower than average, or much lower than average), Pearson chi-square analyses were
conducted to compare the prevalence of these categories across genders and across weight categories. Multinomial logistic regression models were conducted to identify factors that cross-sectionally and prospectively predicted self-esteem category. Predictor variables included self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood. Prior self-esteem category was included as a control variable in longitudinal analyses. Where self-esteem category was the independent variable, Kruskal-Wallis analyses and follow-up Jonckheere-Terpstra tests were used to examine whether the dependent variables under investigation decreased as self-esteem category improved from much lower than average self-esteem to above average self-esteem. Mann-Whitney U post hoc tests were used to examine which of these self-esteem categories were significantly different on these variables.

To examine the role of self-esteem as a protective factor within the objectification theory framework, tests for moderation were conducted. Although moderators can be metric or nonmetric (meaning that both absolute self-esteem scores and self-esteem category could be examined), given the unequal sample sizes between self-esteem categories, only absolute self-esteem was examined as a potential moderator. One specific pattern of interaction was investigated, that of a buffering interaction in which the moderator variable weakens the relationship of the predictor variable on the outcome (Cohen, Cohen, West, & Aiken, 2003). This examination was based on the procedures outlined by Baron and Kenny (1986), where a moderator is defined as a variable that impacts the strength of the relationship between an independent and dependent variable, and functions as a significant interaction between itself and the independent variable.

Hierarchical multiple linear regression has been argued as the preferred method for identifying the presence and nature of moderating effects (Frazier, Tix, & Barron, 2006).
2004), and was therefore employed in the examination of the moderating effect of self-esteem. Specifically, the predictor variable of interest and proposed moderator (i.e., self-esteem) were entered at Step 1 of the analysis (along with any control variables). The interaction term (i.e., the product of the predictor moderator) was entered at Step 2. Evidence for a moderator effect is found at Step 2 by a statistically significant increment in $R^2$ and a statistically significant beta weight. Effect size of the interaction was also examined, with $\Delta R^2$ values $\geq .02$ representing unique contributions to the overall criterion (Cohen, 1992). Independent and moderator variables were centered prior to analysis to reduce problems associated with multicollinearity among the variables in the regression equation. Centering was accomplished by subtracting the grand mean from each participant’s score on the variables of interest. In longitudinal moderation analyses, prior levels of the dependent variable under investigation were controlled for at Step 1. Prior levels of the dependent variable under investigation were also centered prior to analysis. Where significant interaction effects were identified, scatterplots with fitted regression lines were used to interpret the moderating effect of self-esteem. These regression lines allowed the significance of the simple slopes to be evaluated for high and low levels of self-esteem. Post hoc probing of the identified effects was conducted using the procedures outlined by Holmbeck (2002) and Aiken and West (1991).

To address the secondary aim of this study, that is, to examine gender and weight category differences in self-esteem, a between-groups ANOVA was performed. Gender differences were further examined using gender interaction terms that allowed gender differences in the relationship between the variables under investigation to be investigated. Interaction terms were calculated by multiplying gender (0 = male, 1 = female) by self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, depressed mood, and self-esteem. All variables were centered prior to analysis and significant effects were probed using the
procedures outlined by Holmbeck (2002) and Aiken and West (1991). Changes in self-esteem over time were examined using latent growth modelling, described in detail in Chapter 4 (Section 4.3.5).

7.4. Results

7.4.1. Data suitability. Data were explored prior to analysis to ensure they did not violate assumptions of linearity and normality. Scatterplots confirmed there were no curvilinear relationships between any of the assessed variables. The variables of weight and shape concern and dietary restraint were not normally distributed (skewness > 2, kurtosis > 4). Scores on these variables were transformed using a square root transformation. Skewness and kurtosis significantly improved (skewness < 2, kurtosis < 4). Transformed scores were therefore used in all analyses. As described in Chapter 4 (Section 4.4.1), outliers were retained as they were not truly aberrant.

Prior to analysis, data were also examined for any missing values. Details regarding the treatment of missing data were given in Chapter 5 (Section 5.4.1) and are not repeated here. Power analysis indicated that 200 participants would provide over 80% power to detect a medium effect size (i.e., an $R^2$ of at least .15) for regression analyses with one to seven predictor variables, where alpha is set to .05. A sample size of 200 was also found to be sufficient to detect interaction effects that independently account for at least 3% ($\Delta R^2 = .03$) of the variance of the dependent variable under investigation, where power is set to 80% and alpha is set to .05. For multinomial logistic regression analyses, a case-to-variable ratio of 20:1 is preferred, although a minimum ratio of 10:1 is acceptable (Hosmer & Lemeshow, 2000). With nine predictor variables, the sample size of this study exceeded the preferred ratio (24:1).

Assumption requirements for the individual analyses being conducted are detailed in their relevant sections. For hierarchical multiple linear regression analyses, data were explored for heteroscedasticity (examination of the standardised residual
plot), multicollinearity (examination of the variance inflation factor and tolerance), and influential cases (examination of Cook’s distance). For multinomial logistic regression analyses, standard errors for each coefficient were examined to assess for multicollinearity, with standard errors > 2.00 indicating the presence of multicollinearity between variables (Tabachnick & Fidell, 1996).

7.4.2. Descriptive information and preliminary analyses. Mean self-esteem scores for the overall sample and separated by gender and weight category are presented in Table 1. Scores from all three assessment points are presented. To examine gender and weight category differences, a 2 (gender) × 2 (weight category) between-groups ANOVA was performed. A significant main effect of gender was found at T1 only, $F(1, 215) = 7.11, p = .008, \eta^2_{\text{partial}} = .03$, with girls reporting significantly lower levels of self-esteem than boys. Neither the main effect of weight category, nor the interaction between gender and weight category, were significant at any time point.

Latent growth curve modelling revealed no significant change in self-esteem over time ($M = -0.03, SE = 0.32, p = .927$). When gender and weight category were included in this growth model as covariates, they did not significantly predict change in self-esteem over time (gender: $b = 0.46, p = .477$; weight category: $b = 1.12, p = .201$).
Table 1

*Means (and Standard Deviations) of Self-Esteem, Separated by Gender and Weight Category*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender diff.</th>
<th>Weight categorya</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>Self-esteem T1</td>
<td>45.78 (8.46)</td>
<td>47.34 (7.76)</td>
<td>44.61 (8.80)</td>
<td>p = .008</td>
<td>46.01 (8.54)</td>
</tr>
<tr>
<td></td>
<td>n = 247</td>
<td>n = 106</td>
<td>n = 141</td>
<td></td>
<td>n = 209</td>
</tr>
<tr>
<td>Self-esteem T2</td>
<td>44.49 (8.49)</td>
<td>44.59 (8.82)</td>
<td>44.42 (8.26)</td>
<td>p = .710</td>
<td>44.32 (8.65)</td>
</tr>
<tr>
<td></td>
<td>n = 229</td>
<td>n = 99</td>
<td>n = 130</td>
<td></td>
<td>n = 192</td>
</tr>
<tr>
<td>Self-esteem T3</td>
<td>45.51 (8.56)</td>
<td>46.28 (8.23)</td>
<td>44.94 (8.78)</td>
<td>p = .165</td>
<td>45.38 (8.74)</td>
</tr>
<tr>
<td></td>
<td>n = 219</td>
<td>n = 94</td>
<td>n = 125</td>
<td></td>
<td>n = 184</td>
</tr>
</tbody>
</table>

*Note. Ov/Ob = Overweight/Obese.*

*aAs weight category was stable across time, descriptive statistics are presented at all three assessment points, but with T1 weight category used to categorise participants as healthy-weight or overweight/obese.*
The proportion of participants who reported above average, average, lower than average, or much lower than average self-esteem is presented in Table 2. The majority of participants reported average or above average self-esteem at each assessment, with approximately 16% to 19% of participants reporting lower than average or much lower than average self-esteem. A 2 (gender) × 4 (T1 self-esteem category) Pearson chi-square analysis revealed a significant association between gender and self-esteem category, $\chi^2(3) = 14.80, p < .002$, Cramér’s $V = .26$. To help understand the nature of this statistically significant omnibus effect in greater detail, the adjusted standardised residuals were tested for statistical significance. Using a Bonferroni-adjusted alpha level of .01 (.05/4), a disproportionately larger percentage of girls had much lower than average self-esteem and a disproportionately larger percentage of boys had above average self-esteem. This analysis was repeated at T2 and T3. Significant differences between boys and girls at other assessments are presented in Table 2.

The above Pearson chi-square analyses were repeated with weight category. These 2 (weight category) × 4 (self-esteem) Pearson chi-square analyses revealed no significant association between weight category and self-esteem category at any assessment point.
Table 2

Proportion of Children Reporting Above Average, Average, Lower Than Average, and Much Lower Than Average Self-Esteem, Separated by Gender and Weight Category

<table>
<thead>
<tr>
<th>Self-esteem category</th>
<th>Time</th>
<th>Overall</th>
<th>Gender</th>
<th>Gender diff.</th>
<th>Weight category&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Weight category diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Healthy</td>
<td>Ov/Ob</td>
</tr>
<tr>
<td>Above average</td>
<td>T1</td>
<td>40.2</td>
<td>51.1</td>
<td>32.0</td>
<td>41.3</td>
<td>34.3</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>33.3</td>
<td>36.2</td>
<td>31.2</td>
<td>33.2</td>
<td>34.3</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>41.7</td>
<td>46.2</td>
<td>38.4</td>
<td>40.2</td>
<td>50.0</td>
</tr>
<tr>
<td>Average</td>
<td>T1</td>
<td>43.8</td>
<td>42.6</td>
<td>44.8</td>
<td>44.0</td>
<td>42.9</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>47.5</td>
<td>47.9</td>
<td>47.2</td>
<td>46.7</td>
<td>51.4</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>41.7</td>
<td>45.2</td>
<td>39.2</td>
<td>42.9</td>
<td>35.3</td>
</tr>
<tr>
<td>Lower than average</td>
<td>T1</td>
<td>8.2</td>
<td>4.3</td>
<td>11.2</td>
<td>8.2</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>11.4</td>
<td>9.6</td>
<td>12.8</td>
<td>12.5</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>10.1</td>
<td>3.2</td>
<td>15.2</td>
<td>9.8</td>
<td>11.8</td>
</tr>
<tr>
<td>Much lower than average</td>
<td>T1</td>
<td>7.8</td>
<td>2.1</td>
<td>12.0</td>
<td>6.5</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>7.8</td>
<td>6.4</td>
<td>8.8</td>
<td>7.6</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>6.4</td>
<td>5.4</td>
<td>7.2</td>
<td>7.1</td>
<td>2.9</td>
</tr>
</tbody>
</table>

<sup>Note</sup>. Ov/Ob = Overweight/Obese.

<sup>a</sup>As weight category was stable across time, descriptive statistics are presented at all three assessment points, but with T1 weight category used to categorise participants as healthy-weight or overweight/obese.
7.4.3. Relationship between self-esteem and the constructs of objectification theory.

7.4.3.1. Objectification theory variables as predictors of self-esteem.

7.4.3.1.1. Cross-sectional analyses (continuous data). A series of multiple regression analyses were conducted to determine whether self-objectification and its proposed consequences were significant cross-sectional predictors of self-esteem. Given the varied results found between boys and girls in descriptive analyses, gender was controlled for in these regressions.

Self-objectification, body dissatisfaction, weight and shape concern, and depressed mood all emerged as significant contributors of self-esteem in univariate analyses and were therefore combined in a multivariate analysis, results of which are presented in Table 3. This model was significant, $F(5, 212) = 6.91, p < .001$, accounting for 14% of the variance in self-esteem. Only depressed mood emerged as a significant, negative, cross-sectional predictor of self-esteem, uniquely accounting for 6.25% of the variance. Examination of possible gender interactions did not reveal any significant interactions.

Table 3

Cross-Sectional Predictors of Self-Esteem

<table>
<thead>
<tr>
<th>Variable</th>
<th>$b$</th>
<th>$SE$</th>
<th>95% CI</th>
<th>$\beta$</th>
<th>$p$ value</th>
<th>Part $r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-1.44</td>
<td>1.10</td>
<td>[-3.62, 0.73]</td>
<td>-.09</td>
<td>.192</td>
<td>-.08</td>
</tr>
<tr>
<td>Self-objectification</td>
<td>-0.08</td>
<td>0.06</td>
<td>[-0.20, 0.04]</td>
<td>-.09</td>
<td>.176</td>
<td>-.09</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>-0.50</td>
<td>0.47</td>
<td>[-1.41, 0.43]</td>
<td>-.07</td>
<td>.295</td>
<td>-.07</td>
</tr>
<tr>
<td>Weight and shape conc.¹</td>
<td>-1.34</td>
<td>1.19</td>
<td>[-3.68, 1.01]</td>
<td>-.08</td>
<td>.263</td>
<td>-.07</td>
</tr>
<tr>
<td>Depressed mood</td>
<td>-1.15</td>
<td>0.29</td>
<td>[-1.72, -0.57]</td>
<td>-.27</td>
<td>&lt; .001</td>
<td>-.25</td>
</tr>
</tbody>
</table>

¹Weight and shape concern scores represent a composite of selected items from the Weight Concern and Shape Concern subscales of the ChEDE (as described in Section 7.3.3.5).
7.4.3.1.2. Cross-sectional analyses (categorical data). Multinomial logistic regression models were used to identify factors that cross-sectionally predicted self-esteem category. The predictor variables were gender, self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood. The specified model provided a significantly better fit to the data (i.e., was more accurate at predicting self-esteem category) than the null model, $\chi^2(24) = 58.93, p < .001$. Other goodness of fit statistics (Pearson and Deviance) were not significant, $\chi^2(624) = 582.53, p = .881$ and $\chi^2(624) = 428.80, p = 1.00$ respectively, indicating a significantly better fit for the specified model. Classification accuracy of the overall model was 55%. This classification accuracy surpassed the proportional accuracy achievable by chance alone by more than 25%, supporting the utility of the model. There was no evidence of numerical problems in the solution (i.e., $SE < 2.00$).

Using a Bonferroni-adjusted alpha level of .006, likelihood ratio tests revealed that among the set of cross-sectional predictors, only depressed mood was significant in distinguishing between self-esteem groups, $\chi^2(3) = 15.13, p = .002$. Examination of parameter estimates (presented in Table 4) revealed that those participants who reported greater depressed mood were more likely to be in the much lower than average, lower than average, and average self-esteem groups than in the above average self-esteem group. Specifically, for one unit increase in depressed mood, the odds of being in the much lower than average, lower than average, and average self-esteem groups compared to the above average self-esteem group increased by 61.2%, 51.9%, and 40.1% respectively. Although several other variables emerged as significant when examined independently (gender, body shame, weight and shape concern), these variables either (a) did not have an overall relationship with self-esteem category in the likelihood ratio test (gender, weight and shape concern) or (b) had significance values greater than the Bonferroni-adjusted alpha (body shame).
### Table 4

Cross-Sectional Predictors of Self-Esteem Category

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Much lower than average</th>
<th></th>
<th>Reference category: Above average self-esteem</th>
<th>Lower than average</th>
<th></th>
<th>Average</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$ (SE)</td>
<td>Wald OR</td>
<td>95% CI</td>
<td>$b$ (SE)</td>
<td>Wald OR</td>
<td>95% CI</td>
<td>$b$ (SE)</td>
</tr>
<tr>
<td>Gender (Male)</td>
<td>-1.77 (0.83)</td>
<td>4.49*</td>
<td>0.17 [0.03, 0.88]</td>
<td>-0.91 (0.65)</td>
<td>1.96</td>
<td>0.40 [0.11, 1.44]</td>
<td>-0.30 (0.32)</td>
</tr>
<tr>
<td>Self-objectification</td>
<td>0.02 (0.03)</td>
<td>0.42</td>
<td>1.02 [0.96, 1.09]</td>
<td>0.04 (0.03)</td>
<td>1.70</td>
<td>1.04 [0.98, 1.11]</td>
<td>0.02 (0.02)</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>0.35 (0.27)</td>
<td>1.77</td>
<td>1.43 [0.85, 2.40]</td>
<td>0.38 (0.24)</td>
<td>2.47</td>
<td>1.46 [0.91, 2.35]</td>
<td>0.12 (0.14)</td>
</tr>
<tr>
<td>Body surveillance</td>
<td>-0.30 (0.19)</td>
<td>2.66</td>
<td>0.74 [0.51, 1.06]</td>
<td>-0.17 (0.16)</td>
<td>1.18</td>
<td>0.85 [0.62, 1.15]</td>
<td>-0.03 (0.08)</td>
</tr>
<tr>
<td>Body shame</td>
<td>0.14 (0.16)</td>
<td>0.81</td>
<td>1.15 [0.85, 1.57]</td>
<td>-0.14 (0.14)</td>
<td>0.90</td>
<td>0.87 [0.66, 1.16]</td>
<td>-0.20 (0.08)</td>
</tr>
<tr>
<td>Weight and shape concern</td>
<td>0.60 (0.73)</td>
<td>0.67</td>
<td>1.82 [0.43, 7.63]</td>
<td>1.55 (0.74)</td>
<td>4.46*</td>
<td>4.72 [1.12, 19.95]</td>
<td>0.92 (0.43)</td>
</tr>
<tr>
<td>Dietary restraint</td>
<td>-0.28 (0.78)</td>
<td>0.13</td>
<td>0.76 [0.17, 3.48]</td>
<td>-2.25 (1.17)</td>
<td>3.71</td>
<td>0.11 [0.01, 1.04]</td>
<td>-0.14 (0.39)</td>
</tr>
<tr>
<td>Depressed mood</td>
<td>0.48 (0.16)</td>
<td>8.64*</td>
<td>1.61 [1.17, 2.22]</td>
<td>0.42 (0.16)</td>
<td>7.12*</td>
<td>1.52 [1.12, 2.07]</td>
<td>0.34 (0.11)</td>
</tr>
</tbody>
</table>

*Note. OR = Odds Ratio.*

*aTransformed scores used in analyses.*

*p < .05. †p < .006.
7.4.3.1.3. Prospective analyses (continuous data). A series of hierarchical multiple regression analyses were conducted to determine whether self-objectification and its proposed consequences significantly predicted self-esteem over time, and to evaluate the relative contributions of these predictor variables. Regression analyses were conducted examining significant predictors of self-esteem over 12 months and over 24 months. Gender and prior levels of self-esteem were controlled for in all analyses.

Univariate analyses examining T1 predictors of T2 self-esteem revealed that none of the predictor variables of interest were significantly related to T2 self-esteem. As such, multivariate analyses were not conducted. When univariate analyses examining T2 predictors of T3 self-esteem were conducted, T2 body shame emerged as a significant predictor of T3 self-esteem, \( F(4, 213) = 30.89, p < .001; F_{\text{change}}(1, 213) = 4.97, p = .027 \). Gender, T1 and T2 self-esteem, and T2 body shame accounted for 37% of the variance in T3 self-esteem \( (R^2 = .37, R^2_{\text{adjusted}} = .36) \), with T2 body shame uniquely accounting for an additional 1.44% of the variance. Unstandardised parameter estimates, confidence intervals, and standardised parameter estimates from this analysis are presented in Table 5.

Univariate analyses examining T1 predictors of T3 self-esteem revealed that none of the predictor variables of interest emerged as significant predictors of T3 self-esteem. As such, multivariate analyses were not conducted.
Table 5

Hierarchical Multiple Regression Analyses Predicting T3 Self-Esteem From T2 Body Shame and T2 Body Shame × Gender

<table>
<thead>
<tr>
<th>Predictor</th>
<th>ΔR²</th>
<th>b</th>
<th>SE</th>
<th>95% CI for b</th>
<th>β</th>
<th>p value</th>
<th>Part r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>-0.95</td>
<td>0.96</td>
<td>[-2.86, 0.95]</td>
<td>-.06</td>
<td>.323</td>
<td>-.05</td>
</tr>
<tr>
<td>T1 self-esteem</td>
<td></td>
<td>0.12</td>
<td>0.06</td>
<td>[0.00, 0.25]</td>
<td>.12</td>
<td>.056</td>
<td>.11</td>
</tr>
<tr>
<td>T2 self-esteem</td>
<td></td>
<td>0.52</td>
<td>0.06</td>
<td>[0.40, 0.65]</td>
<td>.52</td>
<td>&lt; .001</td>
<td>.46</td>
</tr>
<tr>
<td>Step 2</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>-0.73</td>
<td>0.96</td>
<td>[-2.62, 1.16]</td>
<td>-.04</td>
<td>.448</td>
<td>-.04</td>
</tr>
<tr>
<td>T1 self-esteem</td>
<td></td>
<td>0.12</td>
<td>0.06</td>
<td>[0.00, 0.25]</td>
<td>.12</td>
<td>.054</td>
<td>.11</td>
</tr>
<tr>
<td>T2 self-esteem</td>
<td></td>
<td>0.50</td>
<td>0.06</td>
<td>[0.37, 0.62]</td>
<td>.49</td>
<td>&lt; .001</td>
<td>.43</td>
</tr>
<tr>
<td>T2 body shame</td>
<td></td>
<td>-0.50</td>
<td>0.22</td>
<td>[-0.93, -0.06]</td>
<td>-.13</td>
<td>.027</td>
<td>-.12</td>
</tr>
</tbody>
</table>

Examination of possible gender interactions revealed that the relationship between T2 body shame and T3 self-esteem was significantly moderated by gender, \(F_{\text{change}}(1, 212) = 6.02, p = .015\). This interaction uniquely accounted for 1.72% of the variance in T3 self-esteem. Unstandardised parameter estimates, confidence intervals,
and standardised parameter estimates from this analysis are presented in Table 5. This interaction was probed using the procedure outlined by Holmbeck (2002). Results are summarised in Figure 1. T2 body shame significantly and negatively predicted T3 self-esteem in girls, $t(212) = -3.27, p = .001$, but not in boys, $t(212) = 0.57, p = .571$.

**Figure 1.** Regression lines for relations between T2 body shame and T3 self-esteem, as moderated by gender and controlling for prior levels of self-esteem. **$p < .01$.**

7.4.3.1.4. **Prospective analyses (categorical data).** Multinomial logistic regression models were used to identify factors that prospectively predicted self-esteem category, controlling for prior self-esteem category. The predictor variables were gender, self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood. Although these specified models provided a significantly better fit to the data (i.e., were more accurate at predicting self-esteem category) than the null model, T1–T2: $\chi^2(27) = 61.02, p < .001$;
T1–T3: $\chi^2(30) = 94.94, p < .001$; and T2–T3: $\chi^2(30) = 94.95, p < .001$, only the control variable of prior self-esteem category emerged as significant in these analyses.

Multinomial logistic regression analyses were also conducted to identify factors that prospectively predicted change in self-esteem category over time. The proportion of participants whose self-esteem improved, worsened, or remained stable over time is presented in Table 6. As can be seen, approximately 50% of the sample remained stable while an equal proportion of participants improved and worsened. The predictor variables of gender, T1 self-objectification, T1 body surveillance, T1 body shame, T1 weight and shape concern, T1 body dissatisfaction, T1 dietary restraint, and T1 depressed mood were entered into a multinomial regression model with change in self-esteem between T1 and T3 entered as the dependent variable. The specified model provided a significantly better fit to the data than the null model, $\chi^2(16) = 27.74, p = .034$; however, using a Bonferroni-adjusted alpha level of .007, no individual variable significantly predicted change in self-esteem over time.

Table 6

<table>
<thead>
<tr>
<th>Self-esteem</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable</td>
<td>49.1</td>
<td>55.9</td>
<td>44.0</td>
</tr>
<tr>
<td>Worsened</td>
<td>25.2</td>
<td>25.8</td>
<td>24.8</td>
</tr>
<tr>
<td>Improved</td>
<td>25.7</td>
<td>18.3</td>
<td>31.2</td>
</tr>
</tbody>
</table>

*Note.* Values are percentages.

7.4.3.2. *Self-esteem as a predictor of objectification theory variables.*

7.4.3.2.1. Cross-sectional analyses (continuous data). A series of multiple regression analyses were conducted to determine whether self-esteem was significantly associated with self-objectification and its proposed consequences. Gender was
controlled for in all analyses and a Bonferroni-adjusted alpha level of .007 was used to control for the familywise error rate. BMI $z$-score was also controlled for given its association with body image disturbance and eating disorder symptomatology.

Although self-esteem was significantly associated with body dissatisfaction, weight and shape concern, and depressed mood at the $p < .05$ level, a significant association at the $p < .007$ level emerged only for depressed mood, $F_{\text{change}}(1, 215) = 28.60, p < .001$. Gender, BMI $z$-score, and self-esteem accounted for 18% of the variance in depressed mood overall ($R^2 = .18, R^2_{\text{adjusted}} = .16$), with self-esteem uniquely contributing to 10.89% of the variance. Unstandardised parameter estimates, confidence intervals, and standardised parameter estimates are presented in Table 7.

Table 7

Hierarchical Multiple Regression Analyses Predicting Depressed Mood From Self-Esteem and Predicting Dietary Restraint and Depressed Mood From Self-Esteem × Gender

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$b$</th>
<th>SE</th>
<th>95% CI for $b$</th>
<th>$\beta$</th>
<th>$p$ value</th>
<th>Part $r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>0.11</td>
<td>0.11</td>
<td>[-0.11, 0.34]</td>
<td>.07</td>
<td>.314</td>
<td>.07</td>
</tr>
<tr>
<td>BMI $z$-score</td>
<td></td>
<td>0.22</td>
<td>0.06</td>
<td>[0.10, 0.34]</td>
<td>.24</td>
<td>&lt;.001</td>
<td>.24</td>
</tr>
<tr>
<td>Step 2</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>0.02</td>
<td>0.11</td>
<td>[-0.19, 0.24]</td>
<td>.01</td>
<td>.830</td>
<td>.01</td>
</tr>
<tr>
<td>BMI $z$-score</td>
<td></td>
<td>0.21</td>
<td>0.06</td>
<td>[0.10, 0.32]</td>
<td>.23</td>
<td>&lt;.001</td>
<td>.23</td>
</tr>
<tr>
<td>Self-esteem</td>
<td></td>
<td>-0.03</td>
<td>0.01</td>
<td>[-0.05, -0.02]</td>
<td>-.34</td>
<td>&lt;.001</td>
<td>-.33</td>
</tr>
</tbody>
</table>

Continued below
<table>
<thead>
<tr>
<th>Predictor</th>
<th>Δ$R^2$</th>
<th>$b$</th>
<th>SE</th>
<th>95% CI for $b$</th>
<th>$\beta$</th>
<th>$p$ value</th>
<th>Part $r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dietary restraint</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.12</td>
<td>-.03</td>
<td>0.06</td>
<td>[-.14, 0.08]</td>
<td>-.04</td>
<td>.579</td>
<td>-.04</td>
</tr>
<tr>
<td>BMI z-score</td>
<td></td>
<td>.16</td>
<td>0.03</td>
<td>[.10, 0.21]</td>
<td>.34</td>
<td>&lt; .001</td>
<td>.34</td>
</tr>
<tr>
<td>Self-esteem</td>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>[-.01, 0.01]</td>
<td>.02</td>
<td>.822</td>
<td>.01</td>
</tr>
<tr>
<td>Step 2</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>-.04</td>
<td>0.06</td>
<td>[-.15, 0.07]</td>
<td>-.05</td>
<td>.460</td>
<td>-.05</td>
</tr>
<tr>
<td>BMI z-score</td>
<td></td>
<td>.16</td>
<td>0.03</td>
<td>[.10, 0.21]</td>
<td>.36</td>
<td>&lt; .001</td>
<td>.35</td>
</tr>
<tr>
<td>Self-esteem</td>
<td></td>
<td>-.01</td>
<td>0.01</td>
<td>[-.02, 0.00]</td>
<td>-.19</td>
<td>.080</td>
<td>-.11</td>
</tr>
<tr>
<td>Self-esteem × gender</td>
<td></td>
<td>0.02</td>
<td>0.01</td>
<td>[.00, 0.03]</td>
<td>.25</td>
<td>.018</td>
<td>.15</td>
</tr>
<tr>
<td><strong>Depressed mood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td>.18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>0.02</td>
<td>0.11</td>
<td>[.19, 0.24]</td>
<td>.01</td>
<td>.830</td>
<td>.01</td>
</tr>
<tr>
<td>BMI z-score</td>
<td></td>
<td>.21</td>
<td>0.06</td>
<td>[.10, 0.32]</td>
<td>.23</td>
<td>&lt; .001</td>
<td>.23</td>
</tr>
<tr>
<td>Self-esteem</td>
<td></td>
<td>-.03</td>
<td>0.01</td>
<td>[-.05, -.02]</td>
<td>-.34</td>
<td>&lt; .001</td>
<td>-.33</td>
</tr>
<tr>
<td>Step 2</td>
<td>.02</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>0.01</td>
<td>0.11</td>
<td>[-.21, .22]</td>
<td>.00</td>
<td>.956</td>
<td>.00</td>
</tr>
<tr>
<td>BMI z-score</td>
<td></td>
<td>0.22</td>
<td>0.06</td>
<td>[.11, .34]</td>
<td>.25</td>
<td>&lt; .001</td>
<td>.24</td>
</tr>
<tr>
<td>Self-esteem</td>
<td></td>
<td>-.05</td>
<td>0.01</td>
<td>[-.07, -.03]</td>
<td>-.51</td>
<td>&lt; .001</td>
<td>-.31</td>
</tr>
<tr>
<td>Self-esteem × gender</td>
<td></td>
<td>0.03</td>
<td>0.01</td>
<td>[.00, .05]</td>
<td>.22</td>
<td>.033</td>
<td>.13</td>
</tr>
</tbody>
</table>

Exploration of gender interactions revealed that the relationship between self-esteem and dietary restraint, $F_{\text{change}}(1, 214) = 5.68$, $p = .018$, and the relationship between self-esteem and depressed mood, $F_{\text{change}}(1, 214) = 4.60$, $p = .033$, were significantly moderated by gender. These interactions uniquely accounted for an additional 2.25% and 1.74% of the variance in dietary restraint and depressed mood respectively. Unstandardised parameter estimates, confidence intervals, and standardised parameter estimates from these analyses are presented in Table 7.
Results from the post hoc probing of these interactions are summarised in Figures 2 and 3. Although the relationship between self-esteem and dietary restraint was not significant in either boys or girls, the relationship between self-esteem and dietary restraint significantly differed between boys and girls. Specifically, in boys, higher levels of self-esteem were associated with lower levels of dietary restraint, $t(214) = -1.76, p = .080$. The opposite was found in girls, $t(214) = 1.63, p = .104$. The relationship between self-esteem and depressed mood was significant in both boys and girls. The negative association between self-esteem and depressed mood was, however, significantly stronger in boys, $t(214) = -4.98, p < .001$, than in girls, $t(214) = -2.97, p = .003$.

*Figure 2.* Regression lines for relations between T1 self-esteem and T1 dietary restraint, as moderated by gender.
**Figure 3.** Regression lines for relations between T1 self-esteem and T1 depressed mood, as moderated by gender.

**p < .01. ***p < .001.

7.4.3.2.2. Cross-sectional analyses (categorical data). To test the hypothesis that levels of self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood decreased linearly as self-esteem category improved from much lower than average self-esteem to above average self-esteem, a Kruskal-Wallis analysis was performed. Prior to conducting the analysis, the nonparametric assumption of homogeneity of variance was tested and satisfied via the median Levene’s test. The Kruskal-Wallis analysis revealed that self-esteem category was significantly associated with body dissatisfaction, $\chi^2(3) = 13.05$, $p = .005$, $\eta^2 = .06$, and depressed mood, $\chi^2(3) = 23.31$, $p < .001$, $\eta^2 = .11$. Self-esteem category accounted for 6% of the variability in body dissatisfaction and 11% of the variability in depressed mood. A follow-up Jonckheere-Terpstra test suggested a decreasing linear trend effect for body dissatisfaction, $Z = -3.31$, $p < .001$, and depressed mood, $Z = -4.86$, $p < .001$. Using a Bonferroni-adjusted alpha of .008, a series of Mann-
Whitney U post hoc tests revealed that those in the much lower than average self-esteem category had significantly higher levels of body dissatisfaction and depressed mood than those in the above average self-esteem category \( (Z_{body\_dissatisfaction} = -3.12, p = .002; Z_{depressed\_mood} = -3.45, p < .001) \). Those in the lower than average, \( Z = -3.27, p = .001 \), and average, \( Z = -3.63, p < .001 \), self-esteem categories also had significantly higher levels of depressed mood than those in the above average self-esteem category. These findings are depicted in Figures 4 and 5. As can be seen, the pattern of mean ranks was visually consistent with a linear decrease as self-esteem level improved.

*Figure 4. T1 body dissatisfaction as a function of T1 self-esteem category*
7.4.3.2.3. Prospective analyses (continuous data). A series of hierarchical multiple regression analyses were conducted to determine whether self-esteem significantly predicted self-objectification and its proposed consequences over time. As above, regression analyses were conducted examining significant predictors of the variables of interest over 12 months and over 24 months. Gender, BMI $z$-score, and previous levels of the dependent variable under investigation were controlled for in all analyses.

Using a Bonferroni-adjusted alpha level of .007, T1 self-esteem did not significantly predict any of the T2 or T3 variables under investigation. Although T2 self-esteem also did not predict any of the T3 variables, two relationships were significant at the less stringent $p < .05$ level and were associated with $\Delta R^2$ values $\geq .02$: T3 weight and shape concern, $F_{\text{change}}(1, 212) = 6.29, p = .013, b = -0.01, SE = 0.00$,
95% CI [-0.01, 0.00], β = -0.14, ΔR² = .02, and T3 depressed mood, F_{change}(1, 213) = 4.49, p = .035, b = -0.01, SE = 0.01, 95% CI [-0.03, 0.00], β = -0.13, ΔR² = .02.

Examination of possible gender interactions revealed that the relationship between T1 self-esteem and T3 depressed mood, F_{change}(1, 212) = 8.20, p = .005, and the relationship between T1 self-esteem and T3 dietary restraint, F_{change}(1, 212) = 4.02, p = .046, were significantly moderated by gender. The interaction terms accounted for an additional 2.76% and 1.60% of the variance in T3 depressed mood and T3 dietary restraint respectively. Unstandardised parameter estimates, confidence intervals, and standardised parameter estimates from these analyses are presented in Table 8.

Table 8

Hierarchical Multiple Regression Analyses Predicting T3 Depressed Mood and T3 Dietary Restraint From T1 Self-Esteem × Gender

<table>
<thead>
<tr>
<th>Predictor</th>
<th>ΔR²</th>
<th>b</th>
<th>SE</th>
<th>95% CI for b</th>
<th>β</th>
<th>p value</th>
<th>Part r²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>-0.02</td>
<td>0.10</td>
<td>[-0.22, 0.18]</td>
<td>-0.01</td>
<td>.843</td>
<td>-.01</td>
</tr>
<tr>
<td>T3 BMI z-score</td>
<td>-.03</td>
<td>0.06</td>
<td>0.14</td>
<td>[0.03, 0.29]</td>
<td>.14</td>
<td>.016</td>
<td>.12</td>
</tr>
<tr>
<td>T1 depressed mood</td>
<td>0.41</td>
<td>0.07</td>
<td>[0.28, 0.53]</td>
<td>.41</td>
<td>&lt; .001</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>T2 depressed mood</td>
<td>0.01</td>
<td>0.01</td>
<td>[-0.02, 0.00]</td>
<td>-.11</td>
<td>.096</td>
<td>-.10</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td>0.00</td>
<td>0.10</td>
<td>[-0.20, 0.20]</td>
<td>.00</td>
<td>.999</td>
<td>.00</td>
</tr>
<tr>
<td>Gender</td>
<td>0.05</td>
<td>0.07</td>
<td>[0.03, 0.29]</td>
<td>.16</td>
<td>.016</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>T3 BMI z-score</td>
<td>0.42</td>
<td>0.06</td>
<td>[0.30, 0.54]</td>
<td>.43</td>
<td>&lt; .001</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>T1 self-esteem</td>
<td>0.01</td>
<td>0.01</td>
<td>[-0.01, 0.03]</td>
<td>.13</td>
<td>.218</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>T1 self-esteem × gender</td>
<td>0.04</td>
<td>0.01</td>
<td>[-0.06, 0.01]</td>
<td>-.28</td>
<td>.005</td>
<td>-.17</td>
<td></td>
</tr>
</tbody>
</table>

Continued below
Results from the post hoc probing of these interactions are summarised in Figures 6 and 7. T1 self-esteem significantly and negatively predicted T3 depressed mood in girls, $t(212) = -3.02, p = .003$, but not in boys, $t(212) = 1.24, p = .218$ (Figure 6). T1 self-esteem significantly and positively predicted T3 dietary restraint in girls, $t(212) = 1.98, p = .049$, but not in boys, $t(212) = -1.02, p = .307$ (Figure 7).
Figure 6. Regression lines for relations between T1 self-esteem and T3 depressed mood, as moderated by gender.

**p < .01

Figure 7. Regression lines for relations between T1 self-esteem and T3 dietary restraint, as moderated by gender.

*p < .05
7.4.3.2.4. Prospective analyses (categorical data). To test the hypothesis that levels of T2 and T3 self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood decreased linearly as T1 self-esteem category improved from much lower than average self-esteem to above average self-esteem, a Kruskal-Wallis analysis was performed using a Bonferroni-adjusted alpha level of .007. Prior to conducting the analysis, the nonparametric assumption of homogeneity of variance was tested and satisfied via the median Levene’s test. None of the T2 or T3 variables were significantly predicted by T1 self-esteem at the Bonferroni-adjusted alpha level. However, T1 self-esteem category significantly predicted T3 depressed mood at the less stringent \( p < .05 \) level, \( \chi^2(3) = 10.57, p = .014, \eta^2 = .05 \), with a follow-up Jonckheere-Terpstra test suggested a decreasing linear trend effect for depressed mood, \( Z = -3.12, p = .002 \), as self-esteem category improved.

T2 self-esteem category prospectively predicted T3 depressed mood at the Bonferroni-adjusted alpha level, \( \chi^2(3) = 15.47, p < .001, \eta^2 = .07 \), with a follow-up Jonckheere-Terpstra test suggested a decreasing linear trend effect for depressed mood, \( Z = -3.55, p < .001 \), as self-esteem category improved. Using a Bonferroni-adjusted alpha of .008, a series of Mann-Whitney U post hoc tests revealed that those in the much lower than average self-esteem category had significantly higher levels of depressed mood than those in the average, \( Z = -2.82, p = .005 \), and above average, \( Z = -3.70, p < .001 \), self-esteem categories. These findings are depicted in Figure 8. T2 self-esteem category also negatively predicted T3 Body Shame, \( \chi^2(3) = 10.48, p = .015, \eta^2 = .05 \), and T3 weight and shape concern, \( \chi^2(3) = 11.06, p = .011, \eta^2 = .05 \), but at the less stringent \( p < .05 \) level.
7.4.4. Self-esteem as a protective factor. To examine whether self-esteem acts as a moderating variable, changing the relationship between two related variables as opposed to changing the variables themselves, a series of hierarchical multiple regression analyses were conducted on the various relationships posited by objectification theory. As described in Section 7.3.4, one specific pattern of interaction was investigated in the present study, that of a buffering interaction in which the moderator variable weakens the effect of the predictor variable on the outcome variable (Cohen et al., 2003). In all hierarchical models, the predictor variable and moderator variable were entered at Step 1 (along with gender and BMI z-score as control variables), and the product of these two variables was entered at Step 2.

7.4.4.1. Cross-sectional analyses. When the moderating influence of self-esteem on each of the relationships posited by objectification theory was examined, all models emerged as significant. The addition of the interaction term to each of the models,
however, resulted in a significant $\Delta R^2$ only when self-esteem moderated the relationship between body surveillance and weight and shape concern, $F_{\text{change}}(1, 213) = 10.16$, $p = .002$. Unstandardised parameter estimates, confidence intervals, and standardised parameter estimates from this analysis are presented in Table 9. Note that tests of the multivariate assumptions revealed an absence of multicollinearity (variance inflation factor $< 10$, tolerance $> .20$), influential cases (Cook’s distance $< 1.00$), and heteroscedasticity.

Table 9

*Hierarchical Multiple Regression Analysis for the Cross-Sectional Evaluation of Self-Esteem as a Moderator Variable Between Body Surveillance and Weight and Shape Concern*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$b$</th>
<th>SE</th>
<th>95% CI for $b$</th>
<th>$\beta$</th>
<th>$p$ value</th>
<th>Part $r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.13</td>
<td>0.06</td>
<td>[0.01, 0.24]</td>
<td>.13</td>
<td>.035</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>BMI z-score</td>
<td>0.13</td>
<td>0.03</td>
<td>[0.07, 0.19]</td>
<td>.25</td>
<td>&lt; .001</td>
<td>.24</td>
<td></td>
</tr>
<tr>
<td>Body surveillance</td>
<td>0.06</td>
<td>0.01</td>
<td>[0.03, 0.08]</td>
<td>.28</td>
<td>&lt; .001</td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-0.01</td>
<td>0.00</td>
<td>[-0.02, 0.00]</td>
<td>-.15</td>
<td>.017</td>
<td>-.15</td>
<td></td>
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<td>Step 2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.13</td>
<td>0.06</td>
<td>[0.01, 0.24]</td>
<td>.13</td>
<td>.029</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>BMI z-score</td>
<td>0.12</td>
<td>0.03</td>
<td>[0.06, 0.18]</td>
<td>.23</td>
<td>&lt; .001</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>Body surveillance</td>
<td>0.07</td>
<td>0.01</td>
<td>[0.04, 0.09]</td>
<td>.31</td>
<td>&lt; .001</td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-0.01</td>
<td>0.00</td>
<td>[-0.02, 0.00]</td>
<td>-.15</td>
<td>.016</td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>Body surveillance × self-esteem</td>
<td>-0.01</td>
<td>0.00</td>
<td>[-0.01, 0.00]</td>
<td>-.19</td>
<td>.002</td>
<td>-.19</td>
<td></td>
</tr>
</tbody>
</table>
Post hoc probing of this significant interaction revealed that body surveillance was significantly and positively associated with weight and shape concern only at the low self-esteem level, \( t(213) = 5.34, p < .001 \). Body surveillance was not significantly associated with weight and shape concern at the high self-esteem level, \( t(213) = 1.43, p = .154 \). This interaction is depicted in Figure 9.

![Figure 9](image)

*Figure 9.* Regression lines for relations between T1 body surveillance and T1 weight and shape concern, as moderated by self-esteem. 

**7.4.4.2. Prospective analyses.** The relationships tested cross-sectionally were also tested longitudinally with prior levels of the dependent variable under investigation controlled for in hierarchical regression analyses. At the Bonferroni-adjusted alpha level of .005, self-esteem did not prospectively moderate the relationship between any of the variables of interest. At the less stringent \( p < .05 \) level, the relationship between T1 weight and shape concern and T2 dietary restraint was found to be moderated by self-esteem, \( F_{\text{change}}(1, 212) = 5.29, p = .022; b = -0.02, SE = 0.01, 95\% \text{ CI [-0.03, 0.00]}, \).
Post hoc probing of this interaction revealed that T1 weight and shape concern was significantly and positively associated with T2 dietary restraint only at the low self-esteem level, \( t(212) = 3.58, p < .001 \). T1 weight and shape concern was not significantly associated with T2 dietary restraint at the high self-esteem level, \( t(212) = 0.10, p = .921 \). This interaction is depicted in Figure 10.

![Figure 10](image.png)

*Figure 10. Regression lines for relations between T1 weight and shape concern and T2 dietary restraint, as moderated by self-esteem.*

*** \( p < .001 \).

Longitudinal analyses also revealed several significant prospective relationships between the variables posited by objectification theory that had not been specified explicitly in previous chapters of this thesis. Specifically, T1 body surveillance prospectively predicted T3 body shame above and beyond the effects of T2 body shame, gender, and BMI z-score, \( F_{\text{change}}(1, 212) = 12.12, p < .001; b = 0.20, SE = 0.06, 95\% \text{ CI} [0.09, 0.31], \beta = .22; \Delta R^2 = .04 \). T1 body surveillance also prospectively predicted T3 weight and shape concern above and beyond the effects of T2 weight and
shape concern, gender, and BMI z-score, $F_{\text{change}}(1, 212) = 7.56, p = .006; b = 0.03, SE = 0.01, 95\% \text{ CI } [0.01, 0.05], \beta = .16; \Delta R^2 = .02$. Finally, T2 self-objectification prospectively predicted T3 body surveillance above and beyond the effects of T2 body surveillance, gender, and BMI z-score, $F_{\text{change}}(1, 212) = 12.47, p < .001; b = 0.05, SE = 0.01, 95\% \text{ CI } [0.02, 0.07], \beta = .22; \Delta R^2 = .05$.

The significant results obtained in this study are presented pictorially in Figure 11. Where a Bonferroni-adjusted significance level was used, only results that were significant at the stringent level are presented in this figure.
Figure 11. Summary of significant results obtained in the present study.
7.5. Discussion

The present study sought to cross-sectionally and prospectively examine (a) the role of self-objectification and its negative psychological consequences in the development of low self-esteem, (b) the predictive utility of self-esteem in the development of self-objectification and its negative psychological consequences, and (c) the role of self-esteem as a protective factor within the framework of objectification theory. A secondary aim of the present study was to examine gender and weight category differences in self-esteem, as well as changes in self-esteem over time.

Descriptive analyses supported previous research by McGee et al. (2001) that documented low self-esteem in up to 18% of 9- to 13-year-olds. In the present study of 6- to 11-year-olds, 17% of children reported much lower than average or lower than average self-esteem across the assessment period, suggesting that low self-esteem is experienced by a significant minority of young children. Results also support Hypothesis 3 of this study (that girls would report lower levels of self-esteem than boys) and the well-established gender difference in self-esteem (Franklin et al., 2006; Frost & McKelvie, 2004; Kostanski & Gullone, 1998; Kozee et al., 2007; Wigfield et al., 1991). Girls reported significantly lower levels of self-esteem, and were significantly more likely to report much lower than average self-esteem, than boys (who were significantly more likely to report above average self-esteem).

Contrary to Hypothesis 3 (that overweight children would report lower levels of self-esteem than healthy-weight children), and previous research documenting lower self-esteem in overweight children compared to healthy-weight children (Burrows & Cooper, 2002; Davison & Birch, 2001; Franklin et al., 2006; Smeesters et al., 2010), self-esteem levels and self-esteem category did not differ as a result of weight category. This may be because it is the affective distress associated with weight and shape (i.e., body shame) that strongly influences self-esteem, not actual body mass (Kostanski &
Gullone, 1998; Kozee et al., 2007). The absence of a weight category difference may also be due to the relatively small number of children in the overweight or obese categories resulting in inadequate statistical power to detect such effects.

Of primary interest to this study, however, was the relationship between self-esteem and the variables posited by objectification theory. Whilst cross-sectional regression analyses revealed that depressed mood was significantly and negatively associated with self-esteem and self-esteem category (with those reporting greater depressed mood more likely to be in the much lower than average, lower than average, and average self-esteem groups than in the above average self-esteem group), these findings no longer held when examined prospectively. Rather, body shame emerged as a significant, prospective, and negative predictor of self-esteem, partially supporting Hypothesis 1 (that a relationship exists between self-esteem and self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood), and supporting previous longitudinal research in adults and children that indicated that poor body image results in compromised self-esteem in adults and children (Friestad & Rise, 2004; Mendelson et al., 1996; Tiggemann, 2005a). This significant prospective relationship emerged between T2 body shame and T3 self-esteem, and only in girls. That is, higher levels of body shame predicted lower levels of self-esteem in girls only. This finding supports the assertion of Fredrickson and Roberts (1997) that females’ sense of self is largely dependent on how they feel about their bodies. However, whilst they argued that females who self-objectify may have a particularly poor sense of their self-worth as reflected in poor self-esteem—and therefore implied that self-objectification might also have broader implications on psychological well-being generally and self-evaluation specifically—the present study did not find a significant prospective relationship between self-objectification and self-esteem.
Nevertheless, self-esteem appears to be heavily influenced by body shame in girls, and the localisation of this influence between T2 and T3 suggests that the influence of body image disturbance (specifically, body shame) on psychological well-being (specifically, self-esteem) increases and becomes more important in girls between the ages of 9 and 11. Programs aiming to improve psychological well-being in children and reduce individual vulnerability to psychopathology should therefore be implemented around this age, with particular attention paid to the strong influence of body shame in the at-risk subpopulation of females.

Despite finding a significant prospective relationship between body shame and self-esteem, a significant prospective relationship between body dissatisfaction and self-esteem did not emerge. Perhaps self-esteem is more strongly associated with affective body image disturbance than with the discrepancy between a person’s perceived figure and ideal figure, which is a more cognitive process that may or may not be accompanied by a negative emotional response (Stanford & McCabe, 2002). According to Tiggemann (1996), the affective and cognitive ratings associated with some figure rating scales are independent factors that provide different information regarding body dissatisfaction. Tiggemann argued that the affective (or emotional) rating is of greater significance than the cognitive rating (where respondents think themselves as being larger than their ideal). Although the figure rating scales used as a measure of body dissatisfaction in the present study are considered among the best measures of body dissatisfaction in children (R. M. Gardner et al., 1999), as discussed in Section 4.5.1, assessment tools examining affective body dissatisfaction in children are needed.

Given the exact directional nature of the relationship between self-esteem and body image disturbance is unclear, the present study also conducted analyses exploring self-esteem as a predictor of the variables posited by objectification theory. Cross-sectionally, self-esteem was significantly and negatively associated with depressed
mood, whilst self-esteem category was significantly associated with depressed mood and body dissatisfaction. Specifically, participants with above average self-esteem reported less body dissatisfaction and less depressed mood than participants with much lower than average self-esteem.

Prospective analyses revealed that self-esteem significantly predicted weight and shape concern and depressed mood (albeit at the less stringent $p < .05$ level), supporting the role of low self-esteem in the development of body image disturbance and depressed mood. These results were supported in analyses of self-esteem category, with self-esteem category prospectively predicting depressed mood (at the stringent Bonferroni-adjusted alpha level of $p < .007$) and body shame and weight and shape concern (at the less stringent $p < .05$ level). Specifically, above average self-esteem was associated with significantly lower levels of depressed mood, weight and shape concern, and body shame. These findings emerged between the T2 and T3 assessments providing further evidence that the ages of 9 to 11 are a critical period in the development of these disturbances and the influence of self-esteem on this development. The finding that self-esteem category prospectively predicted depressed mood, but depressed mood did not prospectively predict self-esteem category, clarifies the direction of the relationship between these variables. Specifically, given that depressed mood only cross-sectionally predicted self-esteem category, it can be suggested that lower than average self-esteem may be associated with the onset of depressed mood, with this depressed mood then serving to perpetuate low self-esteem. Further analysis of this relationship is required.

Gender interaction analyses revealed that the relationship between self-esteem and depressed mood, and the relationship between self-esteem and dietary restraint, were significantly moderated by gender. Although both these relationships were significant in girls but not in boys, the nature of this interaction differed between the sexes. Specifically, for depressed mood, self-esteem acted as a protective factor in girls,
with higher levels of self-esteem prospectively predicting significantly lower levels of depressed mood. However, self-esteem also acted as a risk factor for girls, with higher levels of self-esteem prospectively predicting significantly higher levels of dietary restraint. This latter finding stands in contrast to previous research by Ricciardelli and McCabe (2001b), which found that only boys and girls with lower levels of self-esteem were likely to engage in body change strategies to increase muscle size. Although the finding from the present study is unexpected, examination of the literature on self-esteem and self-efficacy helps in the clarification of this finding.

Perceived self-efficacy refers to the personal judgement of, or belief in, one’s fundamental ability to cope with challenging situations and successfully organise and execute courses of action required to attain a designated goal or outcome (Bandura, 1977). It is a crucial construct in understanding and modifying behaviour (Parcel et al., 1995). If an individual has doubts as to whether they can perform the necessary activities to attain a desired outcome, the knowledge that a particular course of action will produce that outcome will not influence their behaviour (Bandura, 1977). That is, the strength of an individual’s belief in his or her effectiveness is likely to affect whether he or she will try to attain a desired outcome. Individuals who judge themselves to be capable of undertaking the steps required to achieve a desired outcome will act on this judgement and initiate their efforts.

According to Judge, Erez, and Bono (1998), because self-efficacy incorporates an individual’s judgements of his or her ability to deal with challenges, it is an indicator of positive self-evaluation and is likely to be related to self-esteem. Supporting this proposition, two meta-analyses have found that self-efficacy and self-esteem are strongly related constructs, with an overall correlation of .85 and .86 found in these analyses (Judge & Bono, 2001; Judge, Erez, Bono, & Thoresen, 2002). Locus of control (defined as the degree of control an individual perceives they have in life and the
general expectancy they have about whether outcomes are controlled by their own behaviour or by external sources; Judge et al., 1998), is closely associated with both self-esteem and self-efficacy (Judge et al., 1998; Judge et al., 2002). Individuals with an internal locus of control believe their behaviour controls their lives. Having an internal locus of control therefore supports self-directed courses of action. By contrast, individuals with an external locus of control believe their lives are controlled by external forces. Having an external locus of control therefore discourages self-directed courses of action. In the aforementioned meta-analyses (Judge & Bono, 2001; Judge et al., 2002), locus of control was highly correlated with both self-esteem \( r = .58 \) and \( r = .52 \) and self-efficacy \( r = .59 \) and \( r = .56 \). This suggests that those who believe they can control their circumstances may be more likely than those who believe they have little or no control over their lives to believe that any efforts they initiate will generate change and bring them closer to a desired outcome.

Given this theoretical background, it can be suggested that high self-esteem is predictive of high dietary restraint because high self-esteem is also accompanied by a high degree of self-efficacy and an internal locus of control, meaning that the individual may feel more capable of achieving success through dieting. That is, those with high self-esteem, high self-efficacy, and an internal locus of control may feel that they can control their weight, and may believe that their efforts to do so through dietary restraint will be successful. They are therefore more likely to engage in this behaviour than those with low self-esteem, who may have little or no belief in their ability to successfully lose weight and therefore do not initiate weight-loss efforts. When faced with a goal of losing weight, individuals with low self-esteem, low self-efficacy, and an external locus of control may view the problem negatively, determine that the problem is out of their control and not manageable, and conclude that their efforts at dietary restraint would not help them achieve the desired outcome of weight loss, resulting in low motivation to
initiate weight-loss efforts. This argument has been supported in previous research, with Parcel et al. (1995) arguing that self-efficacy can be conceptualised as a determinant of dietary behaviour. Additionally, Linde, Rothman, Baldwin, and Jeffery (2006) prospectively found an effect of self-efficacy on an individual’s weight control efforts and engagement in a weight-loss program. They therefore argued that self-efficacy is an important mediator of successful weight-loss behaviours. Further examination of the link between self-esteem, self-efficacy, and dietary restraint is warranted, especially given that the positive relationship between self-esteem and dietary restraint in girls was only marginally significant ($p = .049$).

Arguably the most important findings of the present study were those pertaining to self-esteem as a protective factor within the framework of objectification theory. As highlighted above, self-esteem acted as a protective factor in this study, with higher levels of self-esteem resulting in significantly lower levels of depressed mood, both cross-sectionally (in boys and girls) and prospectively (in girls). Cross-sectional moderation analyses also revealed that self-esteem buffered the relationship between body surveillance and weight and shape concern, with the effect of body surveillance on weight and shape concern significant only at the low self-esteem level. Although longitudinal analyses did not reveal a significant moderating effect of self-esteem at the Bonferroni-adjusted alpha level, perhaps the sample size of this study was not large enough to detect a moderating effect had there been one. Supporting this suggestion, at the less stringent $p < .05$ level, self-esteem buffered the relationship between T1 weight and shape concern and T2 dietary restraint. Specifically, T1 weight and shape concern was significantly associated with T2 dietary restraint at the low self-esteem level only. This indicates that self-esteem may indeed play a protective role within the objectification theory framework. Further investigation in a larger sample of children is warranted.
Taken together, results of the present study provide additional evidence in support of the suggestion that the variables of objectification theory (specifically, body shame) are not only associated with disordered eating (Study 2b) and depressed mood (Study 2c), but also with aspects of broader psychological well-being (specifically, self-esteem). Although it has been suggested that this may be especially true for females, who are more likely than males to experience situations that encourage a focus on physical appearance as opposed to other qualities (Fredrickson & Roberts, 1997), the results of this study were obtained whilst controlling for gender. Furthermore, cross-sectional analyses revealed that the association between depressed mood and self-esteem was significantly stronger in boys than in girls, suggesting that the psychological well-being of boys should not be ignored.

The present findings also indicate that self-esteem plays a significant role in how individuals view their bodies. Although more longitudinal research is needed that examines self-esteem as a potential protective factor in the development of physical and psychological issues associated with body image, based on the evidence supporting the role of self-esteem as a protective factor in the development of body image disturbance and depressed mood, improving and fostering self-esteem may be useful in preventing or reducing these disturbances. Improving self-esteem would be particularly beneficial for girls, as it was they who evidenced a significant decrease in depressed mood at higher self-esteem levels. A focus on improving self-esteem generally, as opposed to reducing body image disturbance specifically, also promotes strength-based change and potentially reduces the risk of developing a range of psychopathology. It also promotes individual psychological well-being in other domains. Given that almost 20% of children in the present study reported lower than average self-esteem, improving self-esteem in this population is imperative. It is worth noting, however, that high self-
Esteem may increase the risk of dietary restraint, though given its marginal significance, this findings warrants further review.

### 7.5.1. Limitations

The present study had some limitations that need to be taken into account when interpreting the findings. Several of the limitations (the possibility of bias introduced as a result of self-report, the focus on weight and shape to the exclusion of muscularity concerns, the low reliability of the dietary restraint variable, and the lack of experimental manipulation limiting the confidence that can be placed in causal inferences) were discussed in detail in Study 2b (Chapter 5, Section 5.5.1). Limitations specific to this study, however, include the absence of a measure of affective body dissatisfaction and the possibly inadequate sample size. As discussed above, one reason why the present study found a significant prospective relationship between body shame and self-esteem, but did not find a significant prospective relationship between body dissatisfaction and self-esteem, may have been because self-esteem is more strongly associated with affective body image disturbance than with cognitive body image disturbance. As discussed, the emotional response associated with one’s body shape is of greater significance than perceiving a discrepancy between one’s perceived body shape and ideal body shape (Tiggemann, 1996). Perhaps the importance of having a thinner body, as opposed to the desire to have a thinner body, is more likely to determine the extent to which body image concerns influence other aspects of a child’s life (Ricciardelli & McCabe, 2001a), such as their self-esteem. The development of appropriate tools for the assessment of affective body dissatisfaction in children is needed to further this research.

Additionally, although the sample size of this study was sufficient to detect significant, albeit small, effects, the more complicated analyses involving moderated regression may have been underpowered. Given the Bonferroni adjustments used in the present analyses, it is not surprising that few relationships met the stringent criteria.
required for significance. Relationships that were significant at the \( p < .05 \) level, but not at the more stringent levels, warrant further examination. Replication of this study in a larger sample of children would be valuable. Furthermore, replication with clinical populations may be useful for increasing the variance of the dependent variables under investigation, thereby increasing the proportion of variance that could potentially be explained by the examined predictor variables.

Although an examination of the protective function of self-esteem within the objectification theory framework does not appear to have been conducted in children, hence the undertaking of the present study, it is worth noting that more specific domains of self-esteem, such as body esteem, may also warrant investigation. In a study by Mendelson and White (1985), body esteem deficits were found in overweight children as young as 8 years of age. Self-esteem deficits, however, were found only in participants who had reached adolescence. They therefore hypothesised the existence of a time-lagged relationship between body esteem and self-esteem. Specifically, they hypothesised that being overweight may cause children to feel bad about their weight, with these feelings translating into low body esteem. Low body esteem, in turn, erodes self-esteem globally. As it is possible that a similar relationship exists for healthy-weight children, it is important for future research to examine how the multidimensional constructs of self-esteem and body esteem may be related, and how the variables of objectification theory may influence body esteem specifically. Future research should also continue to explore, within a longitudinal design, other variables that may protect children from developing body image disturbance and eating disorder symptomatology, such as positive social relationships, coping ability, and school environments that foster acceptance of all body types. The examination of these protective factors across the different stages of development, and the follow-up of young children through to late adolescence to capture crucial periods of development, has the added benefit of
permitting the examination of protective factors that are unique to a particular developmental period.

7.5.2. Strengths. Despite the aforementioned limitations, the present study had several strengths. First, as described in Study 2b (Chapter 5, Section 5.2.2), the use of one–on–one interviews provided a way to deal appropriately with the sensitive nature of body image issues whilst also allowing for the assessment process to be appropriate for children of all ages in this study, providing additional support for the validity of the assessed constructs. Second, the use of a self-esteem measure with established psychometric properties allowed the prevalence of low self-esteem in children to be accurately estimated. Third, the longitudinal examination of self-esteem as both a risk factor and outcome of the variables posited by objectification theory allowed the temporal sequence of the constructs under investigation to be determined, extending previous research in the area. Fourth, the use of both boys and girls in the present sample allowed gender differences in the degree of association between variables to be considered. Perhaps the biggest strength of this study, however, is that it appears to be the first to evaluate the role of self-esteem as a protective factor within the objectification theory framework in children.

7.5.3. Conclusion. In examining self-esteem as a variable that moderates the pernicious effects of the associations posited by objectification theory, this study found that self-esteem is an important variable that should be incorporated within models of objectification theory to further the understanding of the development of positive and negative indicators of mental health. This study’s exploration of self-esteem as a possible protective factor is an important investigation that may inform programs aimed at the prevention of body image disturbance. If future research is able to find more evidence validating the role of self-esteem as a buffer between the constructs embedded within the objectification theory framework, the understanding of which variables serve
a protective function and weaken the relationships posited by objectification theory may help inform prevention programs that can then be tailored towards promoting these variables, and ameliorating those critical risk factors and specific mechanisms that strengthen the relationships posited by objectification theory. This provides a basis for theoretically informed programs that target children before puberty and help prevent the decline in body image and self-esteem that often comes with adolescence.
Chapter 8. Study 3: An Investigation of Young Girls’ Assimilation of Objectified Images

8.1. Overview

In the group of quantitative substudies that formed Study 2, several important insights into the application of objectification theory in children were uncovered. The overall conclusion of these substudies was that self-objectification plays a role in the development of body image disturbance, eating disturbances, and depressed mood in both boys and girls. Given this finding, attention is now turned to the processing of objectifying images. The present study used projective techniques to investigate whether young girls assimilate the objectifying images they may routinely encounter in Western society, how they describe these images, and their implicit attitudes towards them. Only girls were investigated as various empirical studies (Plous & Neptune, 1997; Reichert et al., 1999; Sommers-Flanagan et al., 1993) and a review of the literature (Andsager & Roe, 2003) have found that females are more likely to be objectified than males. The appearance norms encountered by females in daily life are also more rigid, homogenous, and pervasive than those encountered by males (Buote et al., 2011). Additionally, as described in Chapter 2 (Section 2.4.5.1.1), girls are more sensitive to societal messages regarding appearance (and may therefore be especially vulnerable to messages of objectification) because they are more likely than boys to be socialised to adopt the traditionally feminine behaviour of pursuing physical attractiveness (Striegel-Moore & Smolak, 2002) and because beauty is a central component of the female gender role stereotype (Striegel-Moore & Franko, 2002).

8.2. Introduction

As noted in Chapter 2 (Section 2.4.1), empirical evidence suggests that the objectification of females in the mainstream media and in Western society has increased in recent years (Krassas et al., 2001; Reichert & Carpenter, 2004; Reichert et al., 1999).
Recent evidence suggests that this is also true for media and other content directed specifically at young girls (American Psychological Association Task Force on the Sexualization of Girls, 2007; Papadopoulos, 2010). In a US content analysis of young girls’ clothing by Goodin et al. (2011), almost 30% of all clothing items examined were found to have sexualising characteristics, that is, the item revealed a sexualised body part, emphasised a sexualised body part, had characteristics associated with sexiness, and/or had writing on it with sexualising content. However, despite these findings, and the idea that objectification influences the broader environment in which girls in Western society grow up, most of the research conducted to date has focused on objectification in adults. Given the studies conducted in previous chapters suggest that self-objectification plays a role in the development of body image disturbance, eating disorder symptoms, and depressed mood in children, it is important to explore whether the assimilation of messages of objectification is evident in children, particularly girls.

As described in Chapter 2 (Section 2.5), middle childhood is a period during which gender constancy is developing. It has been proposed that once children achieve gender constancy, and understand that their gender is stable and irreversible, they seek to behave in ways that are congruent with their gender by selecting same-sex models to imitate and model (Bussey & Bandura, 1999; Kohlberg, 1966). This puts them at risk of encoding and organising the acquired information from objectified images into a global representation of what is considered typical for their gender. Specifically, the pervasiveness of media depictions of objectification may result in children seeing objectification as both normative and ideal (Smolak & Murnen, 2011), encouraging them to adopt objectified appearances and behaviours. Constant exposure to objectifying messages may also lead to the development of a cognitive schema that biases children towards the rewards associated with appearing sexy (Graff et al., 2012). However, despite this risk, there appears to be little research that has examined whether
girls do indeed assimilate objectification from the images they encounter. As such, whilst it is likely that girls will be influenced by this content (Scottish Parliament Equal Opportunities Committee, 2010), the nature of this influence is unclear.

Whilst quantitative studies have provided valuable information on self-objectification and its role in the development and maintenance of body image disturbance and eating disorder symptoms (e.g., Calogero, 2009; Tiggemann & Lynch, 2001; Tiggemann & Williams, 2012; Tylka & Hill, 2004), several important questions regarding the processing of objectified images remain unanswered, particularly in children. Specifically, do young girls assimilate the objectification depicted in the images to which they may be exposed? Are they able to distinguish between objectifying and non-objectifying images? How do they feel about these images? These questions are difficult to answer with quantitative research as the methodological design of quantitative research methods often constrains responses to forced-choice or Likert-type options. These constraints also mean that undifferentiated replies at all ages are a frequent occurrence, leading to the false assumption that there is no progression or refinement of ideas as children get older (Goldman & Goldman, 1982). As such, to fully understand the subjective experience of children when viewing objectifying images, standardised quantitative measures may not be sufficient.

Projective techniques that combine quantitative and qualitative research methods can provide additional insight into poorly understood issues by generating more substantial and varied responses (Goldman & Goldman, 1982; Thastum, Johansen, Gubba, Olesen, & Romer, 2008). Projective techniques are based on the principle that by presenting individuals with a stimulus which they are free to interpret and respond to from their own frame of reference, access to subconscious thoughts is provided (Haire, 1950; Morgan & Murray, 1935). Specifically, it is thought that individuals project aspects of their own personality, motivations, attitudes, opinions, self-concept, thoughts,
and feelings in the process of evaluating and responding to ambiguous stimuli, allowing
a deeper and more nuanced exploration of their reactions (Haire, 1950; Morgan &
Murray, 1935).

Projective techniques that combine quantitative and qualitative research methods
have been proposed as a means of overcoming the subjective element inherent in purely
qualitative research, and the constraints imposed by purely quantitative research,
enhancing the quality of the data collected (Currall, Hammer, Baggett, & Doniger,
1999; Onwuegbuzie & Leech, 2005; Sandelowski, 2000; Strauss & Corbin, 2008).
Furthermore, projective techniques can elicit responses that participants may choose not
to disclose if asked directly (Haire, 1950; McGrath, Sherry, & Levy, 1993; Morgan &
Murray, 1935; Rogers & Beal, 1958). They are therefore advantageous because of their
capacity to circumvent the conscious defences of participants (Lilienfeld, Wood, &
Garb, 2000). As projective techniques allow access to information without relying on
sophisticated literacy skills (and as such are able to uncover responses towards a
stimulus that participants may find difficult to articulate or verbalise; Belk, Ger, &
Askegaard, 2003; Donoghue, 2000; Keegan, 2009; Pettigrew & Roberts, 2011), they
have been found to be effective in eliciting the thoughts and feelings of children (e.g.,
Gonzalez-Rivera & Bauermeister, 2007). Projective stimuli in the form of pictures are
particularly suited to children as they provide a more concrete example of the construct
under investigation (Edelman, 1982). Given their ability to access information and
assess attitudes that respondents may be unaware of, projective techniques are useful for
examining implicit attitudes, that is, attitudes that are characterised by an automatic and
unconscious evaluation of an object or stimulus (Dovidio, Kawakami, & Beach, 2003).

Projective techniques utilised in the context of individual, face–to–face
interviews are especially valuable, as this process allows follow-up questions to be
asked, thereby providing greater insight into participant conceptualisations of the
construct under examination and giving an added dimension to the assessment of knowledge (Goldman & Goldman, 1982). This is important in an area such as objectification where knowledge related to children is limited.

Despite the advantages of projective techniques, an extensive review of the literature found only one study that has utilised this method to examine objectification in children. In this study, Murnen, Smolak, Mills, and Good (2003) combined projective techniques with an interview methodology and presented 146 US children aged 6 to 12 years with pictures of objectified individuals of their own sex. Girls were shown four pictures of celebrity female singers in revealing clothing and boys were shown four pictures of bare-chested male models with muscular torsos that were obtained from fashion catalogues or sports and fitness magazines. Participants were then asked questions about these pictures to examine the role that objectified images of women and men play in young girls’ and boys’ views of their bodies.

Results from the Murnen et al. (2003) study showed that 25% of girls were “acceptors” of the objectified pictures, meaning that for at least 3 of the 4 pictures, they indicated that they liked the pictures specifically because of their objectifying features. A further 18% of girls were “rejectors,” meaning that for at least 3 of the 4 pictures, they indicated that they did not like the pictures specifically because of their objectifying features. Seventeen per cent were “uncertain,” meaning that for at least 3 of the 4 pictures they gave a response of “don’t know,” and 40% were “inconsistent” (responses did not fit any of the above patterns). In boys, 16% were “acceptors,” 3% were “rejectors,” 26% were “uncertain,” and 55% were “inconsistent.” In both boys and girls, internalisation of media ideals (as measured by the Sociocultural Attitudes Towards Appearance Questionnaire; Heinberg, Thompson, & Stormer, 1995) was significantly positively related to liking how the people in the pictures looked, wanting to look like them, and the perceived importance of looking like them. Body esteem
scores (as measured by the Body Esteem Scale; Mendelson & White, 1993) were negatively related to wanting to look like the people in the pictures, but only in girls. Age differences were not found, which may have been due to the smaller sample sizes at each age resulting in low power and precluding reliable interpretation of the results.

Whilst this research suggests that some children may have already internalised messages of objectification, the findings are limited in several ways. First, the pictures viewed by girls in the sample were of celebrities, and control pictures of non-objectified individuals were not shown, potentially confounding the results. It may be that girls in the study wanted to look like the individuals in the pictures and liked the way they looked because they were famous, not because they were representative of an objectified ideal.

Second, although Murnen et al. (2003) gathered informative quantitative data in relation to the acceptance of objectified pictures in young children, and the relationship between body esteem and acceptance of these pictures, information regarding how the pictures were interpreted, and any subconscious meaning attached to them, was not obtained. This is especially relevant for the children whose responses were labelled as “inconsistent” or “uncertain.” It could be that these participants had indeed assimilated objectification, but were too young and/or lacked the vocabulary to verbalise this knowledge. Third, although the projective technique used in the study had the potential to uncover rich information, the assignment of responses to categories (i.e., acceptors, rejectors) meant this important qualitative information was lost.

8.2.1. Present study. Research examining objectification in young girls has failed to answer several fundamental questions pertaining to the processing of objectified images. Specifically, do young girls assimilate the objectification depicted in the images to which they may be exposed? Are they able to distinguish between objectifying and non-objectifying images? How do they feel about these images? Whilst
studies utilising projective techniques that combine qualitative and quantitative research methods appear to have considerable potential to answer these questions, only one study using this methodology has been conducted in the area of objectification in children. This study was limited in a number of ways, making it difficult to draw firm conclusions. Accordingly, the present study aimed to provide an in-depth understanding of how the concept of objectification is assimilated in young girls. Specifically, projective techniques were used to quantitatively and qualitatively explore how young girls describe and respond to depictions of objectified and non-objectified peers to ascertain whether they have assimilated objectification, and to examine any meaning they may subconsciously attach to images depicting objectification. Given the exploratory nature of this study, hypotheses regarding specific findings were not made.

8.3. Method

8.3.1. Design. The present study utilised a combined qualitative and quantitative design to examine girls’ assimilation of objectification. This mixed design allowed for methodological triangulation by using different methods to elicit data relating to the same phenomenon (Tashakkori & Teddlie, 1998). Patterns of convergence were examined to develop and corroborate an overall interpretation (as per Mays & Pope, 2000). The qualitative component of this study involved the collection of information through the use of open-ended questions where participants were encouraged to speak freely. The quantitative component involved the collection of information through the use of closed questions and a grouping task, responses to which were later examined statistically.

8.3.2. Participants and recruitment procedures. Participants were recruited in two ways; via friends and family of the candidate and her supervisors and through a Perth metropolitan primary school. The convenience sample of family and friends comprised 11 girls aged between 6 and 11 years ($M = 8.83, SD = 1.63$), recruited after
obtaining ethics approval from the University of Western Australia’s Human Research Ethics Committee. A letter of introduction describing the purpose and procedures of the study was given to family and friends. Children who received parental consent and provided assent forms were recruited into the study.

One primary school was recruited after receiving approval from the ethics committee for State schools in Western Australia and the school’s Principal. A letter of introduction describing the purpose and procedures of the study was sent to the parents of all girls in Grades 1 to 5, inviting their children into the study and requesting parental approval. Assent forms for children were attached to this invitation. Children who received parental consent and provided assent forms were recruited into the study. The consent rate from this process was 30%, with 31 girls consenting to participate. These participants were aged between 6 and 11 years \( (M = 8.74, SD = 1.37) \). For the combined samples \( (N = 42) \), participants were aged 6 \( (n = 7) \), 7 \( (n = 5) \), 8 \( (n = 10) \), 9 \( (n = 9) \), 10 \( (n = 9) \) and 11 \( (n = 2) \) years, with a mean age of 8.76 years \( (SD = 1.42) \). All participants were Caucasian.

8.3.3. Materials.

8.3.3.1. Interview stimuli. One hundred and sixty eight photographs of young girls were selected from various modelling websites. As the modelling website through which these photos were selected detailed the ethnicity and age of each model, photographs of Caucasian girls aged between 6 and 10 years were able to be selected as stimuli for the present study. This age range was chosen as it reflects the age range of the target sample. Caucasian models were chosen as previous research has found that females portrayed in Australian magazines targeting children typically represent those that are Caucasian in appearance (Napoli & Murgolo-Poore, 2003).

The pictures selected represented a range of objectified and non-objectified girls. Each picture contained one girl, and pictures varied by the type of pose of the girl, the
amount of makeup she was wearing, and the clothes worn. The objectified girls were typically pictured with discernible makeup, wearing revealing clothing, and in a provocative pose, whereas the non-objectified girls did not display these characteristics. A colour copy of each picture was produced on A4-size paper and laminated.

These pictures were then rated according to their perceived degree of objectification by 62 (51 female, 11 male) undergraduate and postgraduate psychology students aged between 17 and 32 years ($M = 21.5$, $SD = 4.33$). All pictures were clearly numbered and participants were asked to rate each picture according to the extent to which the person in the picture was being objectified. The following definition of objectification was provided: *Objectification is defined as occurring whenever a person’s body, body parts or sexual functions are separated out from their person, reduced to the status of mere instruments, or regarded as if they were capable of representing them.* Participants were encouraged to take into account how the children in the pictures were clothed, how they were posed, how much makeup they wore, the situations in which they were presented, and whether their presentation was appropriate given their age of 6 to 10 years. An example of each type of picture (non-objectifying and objectifying) is presented in Figure 1.

Ratings were made on a 9-point scale that ranged from 1 (*very non-objectifying*) to 9 (*very objectifying*), with 5 indicating a neutral point. These ratings were analysed in SPSS. Interrater reliability was 98%. Pictures with a median objectification rating $\leq 3.00$ and $\geq 7.00$ ($n = 16$) were selected for the interview. Prior to testing, the initial interview protocol was shown to a developmental and clinical psychologist who made several recommendations. As a result, changes were made to the protocol, including a reduction in the number of pictures shown to participants and the elimination of questions that were deemed to be similar. These changes were made to shorten the duration of the interview and reduce the possibility of child fatigue.
Of the 16 pictures selected for inclusion in the final interview, eight were the lowest rating non-objectifying pictures and eight were the highest rating objectifying pictures. The mean rating of the non-objectifying pictures was 2.18 (SD = 1.23, Range = 1.62–2.60). The mean rating of the objectifying pictures was 7.90 (SD = 1.29, Range = 7.27–8.50). The difference between these means was significant, \( t(14) = -28.38, p < .001, d = 4.54 \).

Figure 1. Pictures of girls depicted in a non-objectified and objectified way respectively.

8.3.4. Procedure. Participants were individually interviewed in a private room in their home, at the participating school, or in a consulting room at the University campus. All interviews were conducted by the candidate and the average interview length was 20 minutes. The candidate first introduced herself to the participants and made assurances that the interview was not a test, there were no right or wrong answers, and they should answer as honestly as possible. To generate rapport, participants were then asked to talk about their family and the sorts of activities they did together. The assessment part of the interview then began.
The interviews were semistructured, with topics covered in the order in which they naturally arose. Thus, if a participant spontaneously began talking about an issue scheduled to be discussed at a later stage of the interview, they were not interrupted but rather encouraged to continue. The interviews were audio taped and subsequently transcribed verbatim.

8.3.4.1. Part 1. Part 1 of the interview commenced with participants being shown a picture of a non-objectified girl. All participants viewed the same picture. As it has been suggested that direct questions can help a child begin to engage with the interview process (Irwin & Johnson, 2005), the question *Is the person in this picture a boy or a girl?* was asked first to place the child at ease. A series of open and closed questions pertaining to the picture and the person in the picture were then asked. Questions asked were:

1. What do you see in this picture?
2. What do you think the person in the picture is doing?
3. How does the person in the picture look?
4. How old do you think this person is?
5. How old do you think she is trying to be?
6. Do you think this person looks okay for her age?
7. What do you think about the person in the picture?
8. Do you think you would be friends with the person in the picture? (optional probing – Why/Why not?)
9. Would you like to look like them? (optional probing – Why/Why not?)
10. Do you think your friends would like to look like that? (optional probing – Why/Why not?)
11. Do you think boys would like girls to look like that? (optional probing – Why/Why not?)
Participants were then presented with a picture of an objectified girl (matched to the non-objectified girl on age) and the above process was repeated. Several of these questions (Questions 1–3, 6–10) were designed to (a) provide descriptive information on whether participants had assimilated the objectification depicted by the objectified girl, (b) assess whether there were any differences in how participants described the objectified and non-objectified girls, and (c) elicit their implicit attitudes towards the girls depicted in the pictures. Questions pertaining to age (Questions 4 and 5) were designed to examine whether participants perceived the objectified girl as being older than the non-objectified girl. Finally, Question 11 was designed to examine whether participants perceived the objectified girl as being more attractive to the opposite sex than the non-objectified girl. According to Fredrickson and Roberts (1997), a feature of objectification is that individuals are the object of evaluation and are treated as if they exist solely for the pleasure of others. Many content analyses (e.g., Aubrey & Frisby, 2011; Lindner, 2004; Messner et al., 2000) have found that objectifying images of females frequently portray females as being the object of male gaze. Additionally, according to Graff et al. (2012), the sexual objectification of women can involve basing women’s primary value on their sexual appeal to men. This feature of objectification was therefore an important variable to consider in the present study.

8.3.4.2. Part 2. In Part 2 of the interview, participants were randomly assigned to one of two conditions: prototype (Condition 1) and non-prototype (Condition 2). Participants in both conditions were presented with 12 pictures (6 depicting objectification and 6 depicting non-objectification; all different to those pictures presented to participants in Part 1). Presentation of the pictures differed between conditions. Participants in the prototype condition were first presented with 1 objectifying picture and 1 non-objectifying picture. They were then presented with the remaining 10 pictures simultaneously (5 objectifying and 5 non-objectifying) and told
that the girls in the first two pictures presented were in the same class at school as the
girls in the subsequent 10 pictures presented, and the interviewer needed their help
determining which of the 10 girls would be in the same group of friends as Girl 1, and
which of the 10 girls would be in the same group of friends as Girl 2. Participants
assigned to the non-prototype condition were presented with all 12 pictures
simultaneously and told that the girls in the pictures were all in the same class at school
but the interviewer needed help determining who would be friends with each other.
They were then asked to sort the pictures into two groups reflecting the two friendship
groups.

The use of two conditions made it possible to experimentally examine how
strong the assimilation of objectification was in the present sample. Specifically, if
participants in the prototype condition were more accurate at categorising the
objectified pictures than those in the non-prototype condition, this would suggest that
their increased accuracy was not because they had assimilated objectification, but
because they were given a prototype that, in effect, primed them or forced them to
categorise in a way they otherwise would not have. If no difference in accuracy was
found between conditions, however, this would suggest that priming was not needed to
accurately identify objectified images and that the assimilation of objectification was
strong across participants in both conditions.

After participants had sorted the pictures, participants in both conditions were
asked a series of questions about each group of pictures. Questions asked were:

1. Why did you put these girls in the same group?
2. Why do you think they would be friends?
3. What do you think of these pictures? Do you like them?
4. How do the people in these pictures look to you?
5. Would you like to look like the people in the pictures? (optional probing – Why/Why not?)

6. Do you think your friends would like to look like the people in these pictures? (optional probing – Why/Why not?)

7. Do you think other people would want you to look and dress like that? What about your mum and dad? (optional probing – Why/Why not?)

8. Do you think boys would like girls to look like that? (optional probing – Why/Why not?)

Once again, these questions were designed to (a) provide descriptive information on whether participants had assimilated the objectification depicted by the objectified girl, (b) assess whether there were any differences in how participants described the objectified and non-objectified girls, and (c) elicit their implicit attitudes towards the girls depicted in the pictures. Question 7 was added to this protocol to examine whether participants perceived pressure from their parents and others to look a certain way. Once the activity had been completed, participants were given a sticker and thanked for participating.

8.3.5. Data analysis. Transcripts were imported into NVivo 9 for coding and analysing. For Part 1 of the interview protocol, responses were first coded according to the type of picture shown (objectified or non-objectified) and then further coded to the specific subjects of discussion. For Part 2 of the interview protocol, responses were first coded according to condition (Condition 1 or Condition 2), then further coded to participants’ accuracy on the grouping task, the group of pictures being discussed (Group 1 or Group 2), and the specific subjects of discussion. The constant comparative method was used to identify themes that emerged during the interviews. Constant comparison occurs when each item is compared with the rest of the data to establish analytical categories (C. Pope, Ziebland, & Mays, 2000). These categories were then
refined according to the nature of the stimuli (objectified or non-objectified) and investigated further using the query function in NVivo. Examples of these emergent themes included “age,” “appearance,” and “personality and mood.” Prior to analysis, one of the candidate’s supervisors (SP) reviewed the coding hierarchy and agreed on its structure. During the coding process, discussions were held to assess whether the text was appropriately assigned to nodes. Agreement was reached that the coding process was logical and reflective of the interview content.

Quantitative data obtained from the grouping task and relevant closed questions were analysed using independent samples t-tests and Pearson chi-square tests of association conducted in SPSS. For the grouping task, participants’ ability to group the pictures based on whether they were objectifying or non-objectifying was scored out of 60. Specifically, participants were awarded one point for each correct allocation to a group and were deducted one point for each incorrect allocation. Scores were then summed. This score was multiplied by 5 for participants in the non-prototype group, and multiplied by 6 for participants in the prototype group to ensure scores for both conditions were standardised. This scoring procedure was implemented because participants in the prototype condition were given two pictures as prototypes, and as such they had only 10 remaining pictures to categorise and could therefore achieve a maximum score of 10 for accuracy. By contrast, participants in the non-prototype condition were given all 12 pictures to categorise simultaneously and could therefore achieve a maximum score of 12 for accuracy. Given this discrepancy, scores had to be standardised to ensure any observed differences reflected true differences between conditions rather than artefacts as a result of scoring.
8.4. Results

8.4.1. Overall findings. A marked difference in the responses towards objectified and non-objectified girls emerged across both parts of the interview. Appearance themes dominated discussions surrounding objectified girls, whilst discussions relating to non-objectified girls focused more on perceived personality and mood. Given the sample size, age variations were not examined in detail. Overall, however, there did not appear to be any age variation in qualitative findings, although older girls tended to be clearer and more articulate in their descriptions of the girls in the pictures.

Specific findings are presented below by interview part. The majority of participants contributed to the following interpretations with few participants responding “don’t know” or “not sure” to the questions asked. As a preliminary test, analyses were conducted to determine whether differences existed between the two groups of participants recruited for this study (convenience sample and school sample). There were no differences in the accuracy of participants on the sorting task, \( t(40) = 0.88, p = .384, d = 0.29 \). Qualitative responses also did not appear to differ.

8.4.2. Part 1. When asked what they saw in the picture depicting the non-objectified girl, most participants used predominantly descriptive terms to report on what they could see in the picture. By contrast, although most participants also used descriptive terms when commenting on the objectified girl, they commonly made assumptions about her intentions, such as that she was trying to look “cool” and “stylish.” Although both the objectified and non-objectified girls were posing, only the objectified girl was described as such. An example of the different descriptions given to the non-objectified and objectified girls is presented in the following conversations:
Participant #10, 9 years, picture of non-objectified girl

MJ: What do you see in the picture?
Participant (P): There’s a girl, she’s got bluish green eyes. She’s smiling, she’s wearing earrings. Her hair’s blonde. She’s wearing black, pink, and white striped t-shirt, and her t-shirt says Miss, Miss Rock
MJ: Yep
P: And she’s sitting down
MJ: Yep
P: She’s smiling

Participant #18, 10 years, picture of objectified girl

MJ: What do you see in that picture?
P: She's kind of posing
MJ: Posing, what else?
P: Trying to look cool
MJ: Trying to look cool. What makes you think she’s trying to look cool?
P: ‘Cos she’s like got her hands on her hips and…umm the sorts of clothes she’s wearing, and the way she’s like tilting

Clear differences also emerged when participants were asked more specifically how each of the girls looked. Substantially more references were made about the personality and mood of the non-objectified girl compared to the objectified girl. Specifically, most participants described the non-objectified girl as looking “happy,” “nice,” “excited,” “cheerful,” “joyful,” “fun,” “kind,” or “friendly,” with very few participants commenting on her appearance. Of the few that did comment on her appearance, the non-objectified girl was described as looking “pretty,” “cute,” “good,” “nice,” and “normal” (and variations of normal such as “regular” and “natural”). By contrast, most participants described the objectified girl as looking “cool,” “stylish,” “funky,” “posing,” “fancy,” “fashion [sic],” or “attractive,” with very few commenting
on her mood or personality. The following conversations highlight the differing terminology used to describe the non-objectified and objectified girls:

Participant #17, 8 years, picture of non-objectified girl
MJ: How does the person in the picture look?
P: Happy
MJ: Happy. Anything else?
P: Cheerful
MJ: Cheerful. Anything else?
P: No

Participant #10, 8 years, picture of objectified girl
MJ: How does the person in the picture look?
P: She looks 12 years old
MJ: Yep
P: And she looks like kind of like a superstar
MJ: Yeah
P: A young superstar
MJ: What makes you say that?
P: Because she’s like wearing all fancy stuff and posing, being like that (does pose)
MJ: Oh okay
P: And wearing makeup

When participants were given the opportunity to give their opinion on the girls, that is, when they were specifically asked what they thought about the girls in the pictures, many participants commented that the objectified girl was dressed inappropriately, and that her clothing, in particular her top (which showed her midriff), was too short. Many specifically noted that she was showing her belly button and

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1The words “nice,” “cool,” and “stylish” can be interpreted as both personality variables and appearance variables. As such, during the coding of these terms, careful attention was paid to the context in which these words were used so as to permit a contextual judgement as to whether the words were used to denote appearance or personality.
repeated their earlier comments that she was showing off, trying to be cool, and wanting to be popular and look older than she really was:

Participant #21, 9 years, picture of objectified girl

MJ: What do you think about the person in the picture?
P: Umm I think she’s trying to grow up a little quickly
MJ: Oh okay. What makes you say that?
P: Because she doesn’t, I don’t think she’s wearing…sort of clothes that are her age, and she looks like she’s trying to pose as someone like a teenager
MJ: Okay
P: Looks like she might be wearing a little lipgloss as well (giggles)
MJ: Okay, yeah. What is it about her clothes that makes them not be her age?
P: It’s just there (points to midriff), it doesn’t cover her whole stomach and she’s…denim jackets are also… doesn’t go down to the umm length… that also doesn’t cover her stomach

The word “teenager” was frequently used in descriptions of the objectified girl, whereas references towards the non-objectified girl consisted of terms that described these girls as “young,” “childish,” “kiddy,” “little,” and “small.” Additionally, some participants made assumptions about the interests of the objectified girl, describing activities that are typically associated with older children, such as wanting to play with boys and new technology:

Participant #29, 10 years, picture of objectified girl

MJ: What do you think about the person in the picture?
P: Well I think she’s kinda not me, she’s the opposite of me. I think kinda like she’s girly and doesn’t really like to play sport, she just likes to like, like maybe have… play with her iPhone and friends and then like send messages all the time and ring people
Participant #9, 7 years, picture of objectified girl

MJ: What do you think about the person in the picture?

P: I think that she really likes dancing and she likes to go to like parties and going out with her mum and dad and sister and brother or baby if she has one…and she tells her mum if she likes to have a disco and mum and dad might say yes...she likes to play with boys

References to the age of the objectified girl, specifically, the consistent assumption that the objectified girl was trying to look older than she was, were supported in quantitative analyses. When participants were asked how old they thought the girls in the pictures were, significant differences emerged between picture types. Participants reported an estimated mean age of 6.86 years for the non-objectified girl (SD = 1.18), and an estimated mean age of 12.10 years (SD = 2.84) for the objectified girl, t(41) = -12.52, p < .001, d = -2.60. Similar results were obtained when participants were asked how old they thought the girls in the pictures were trying to be. Participants reported a mean age of 8.93 years for the non-objectified girl (SD = 3.65), and a mean age of 15.07 years (SD = 3.75) for the objectified girl, t(41) = -12.57, p < .001, d = -1.66). All participants thought the non-objectified girl looked okay for her age. By contrast, only 69% said the objectified girl looked okay for her age. A 2 × 2 Pearson chi-square analysis found this difference to be significant, χ²(2) = 15.05, p = .001, Cramér’s V = .43. Of those who said the objectified girl did not look okay for her age, most commented that it was because of the nature of her appearance, as demonstrated by the following conversations:

Participant #15, 9 years, picture of objectified girl

MJ: Do you think she looks okay for her age?

P: Umm personally I think maybe, umm, she’s trying to be a little bit too umm, glossy and too umm, wearing too much things

MJ: Too much what?
P: Too much umm, like being too much accessories and stuff
MJ: Oh okay
P: Coz she got lipgloss, she’s got things on her eye, she’s got everything

Participant #31, 10 years, picture of objectified girl
MJ: Do you think she looks okay for her age?
P: No
MJ: No. Why do you say that?
P: Because, because it looks like she’s trying to be like, she’s just trying to be older and she just wants to be popular almost
MJ: Yeah. What about her makes you say that?
P: Because she’s wearing something that some like cool people wear

It is important to note that although the majority of participants said the objectified girl looked okay for her age, the objectified girl was assumed to be older than she really was. As such, the majority of participants may have thought her appearance was appropriate given what they perceived to be her age. For instance, as demonstrated in the following conversation, the participant thought the objectified girl was 15 years old, not her actual age of 10. As such, her appearance was deemed appropriate:

Participant #23, 8 years, picture of objectified girl
MJ: Do you think she looks okay for her age?
P: Hmm yes
MJ: Yes. What makes you say that? How does she look okay for her age?
P: Because most umm teenagers about around 15 are wearing those sort of things

Although most participants said they would be friends with the non-objectified girl because she looked “nice,” “friendly,” “normal,” “simple,” and “happy,” they were less interested in befriending the objectified girl because she was “too old” for them, not their “style,” or “not the girl” for them. Some participants also said they would not be
friends with the objectified girl because of her personality, describing her as looking “mean,” “scary,” “bossy,” “not nice,” like “she thinks she is the best,” and like a “bully.” These contrasting views towards the girls in the pictures are illustrated in the following conversations:

Participant #10, 8 years, picture of non-objectified girl
MJ: Do you think you would be friends with her if you knew her in real life?
P: Yes
MJ: Yes, what makes you say that?
P: Because she looks really nice, and she looks friendly, and I bet she would be really nice to other people
MJ: Yeah
P: And she looks like she has tons of friends

Participant #23, 8 years, picture of non-objectified girl
MJ: Do you think you would be friends with the person in the picture if you knew her in real life?
P: Yeah
MJ: Yeah, why?
P: Because she looks like a umm, fun person to be friends with

Participant #10, 8 years, picture of objectified girl
MJ: Do you think you’d be friends with her if you knew her in real life?
P: Yeah
MJ: Yep
P: But maybe not coz umm, maybe she’ll be kind of bossy
MJ: Okay, what makes you say that?
P: Because lots of stars they get too overexcited… like lots of people who like want to be stars, like that’s what I think she wants to be
MJ: Yeah
P: Umm they like [are] kind of overexcited and I think they’re a little bit bossy
Participant #2, 10 years, picture of objectified girl

MJ: Do you think you would be friends with the person in the picture if you knew her in real life?
P: Hmm, maybe yeah
MJ: Yeah why do you say that?
P: Coz she might be, she might have a bad personality.
MJ: Yeah
P: Like she’s a bully or something
MJ: And so you wouldn’t be friends with her because of that?
P: Hmm
MJ: Yep. What makes you say that she might have a bad personality or she might be a bully?
P: Umm she’s wearing those clothes
MJ: Yep. What is it about those clothes that she’s wearing that makes you think bully?
P: Like the jacket

Although the majority of participants were positive in their opinions of the non-objectified girl and wanted to be friends with her, they did not want to look like her. The majority of participants also did not want to look like the objectified girl despite describing her as “cool” and “stylish.” However, the reasons given for not wanting to look like these girls varied. For the non-objectified girl, most participants said they did not want to look like her because they liked their own personal style more. By contrast, for the objectified girl, most participants said they did not want to look like her because they did not like her style. Specifically, they did not want to look like her because of the objectified nature of her clothing. These contrasting reasons for not wanting to look like the girls in the pictures are highlighted in the following conversations:
Participant #24, 9 years, picture of non-objectified girl
MJ: Would you like to look like her?
P: Hmm I’m happy just looking like myself

Participant #35, 10 years, picture of non-objectified girl
MJ: Would you like to look like her?
P: Umm no
MJ: No, why not?
P: Because I like myself just the way I am

Participant #22, 8 years, picture of objectified girl
MJ: Would you like to look like her?
P: Nope
MJ: No. Why not?
P: Probably because she, I don’t really like the hair or the clothes
MJ: Okay. What don’t you like about them?
P: I don’t like how the tops not covering that part (points to tummy)…and don’t really like jeans with little things in them, as in scratches

Participant #28, 9 years, picture of objectified girl
MJ: Would you like to look like her?
P: No
MJ: No. Why not?
P: Because she dresses inappropriately

Participant #31, 10 years, picture of objectified girl
MJ: Would you like to look like her?
P: No
MJ: No, why not?
P: Because she, I wouldn’t like to have my…belly button on show

Although most participants reported that they would not like to look like the objectified girl, they thought that their friends would like to look like her, with the reasons given for their friends wanting to look like her correlating with their own reasons for not wanting to look like her. Specifically, they tended to feel that their
friends wanted to be older than they were, wanted to be cool and fashionable, wanted to wear makeup, had similar interests to the objectified girl, and were “that kind of person”:

Participant #22, 8 years, picture of objectified girl
   MJ: Do you think your friends would like to look like her?
   P: Yeah
   MJ: Why do you say that?
   P: Well because some of them, most of them, want to be teenagers
   MJ: Oh okay
   P: And sort of older than they are

Participant #7, 6 years, picture of objectified girl
   MJ: Do you think your friends would like to look like her?
   P: Ummmm (long pause) yeah
   MJ: Yes, why?
   P: Because they might think she’s pretty but I think she’s showing off

Finally, although most participants reported that they did not want to look like either the objectified or non-objectified girl, many appeared to recognise the appeal of the objectified girl for boys, reporting that boys would like girls to look like the objectified girl because she looks “cool,” “pretty,” “cute,” and “older”:

Participant #26, 9 years, picture of objectified girl
   MJ: Do you think boys would like girls to look like this and dress like this?
   P: Probably
   MJ: Yeah, why?
   P: Coz like once you get to high school and stuff boys are always looking for a girlfriend and they’d like these kind of girls
   MJ: Why would they like these kind of girls?
   P: Because they’re kind of into modelling and stuff, they like that kind of thing
Participant #13, 8 years, picture of objectified girl

MJ: Do you think boys would like girls to look like that?
P: Definitely, yeah. Especially if they’re high school boys
MJ: Okay
P: Just like Valentine’s cards. They go give that girl lots of Valentine’s cards
MJ: Okay yeah. Why do you think they’d give it to that girl?
P: Because she looks very pretty in boys’ eyes

8.4.3. Part 2. As described in Section 8.3.4.2, in Part 2 of the interview participants were asked to place several pictures of both objectified and non-objectified girls into two groups. As noted previously, in order to experimentally examine how strong the assimilation of objectification was in the present sample, in one condition prototypes for each of the groups were given and in the other they were not. The trends in responses that emerged in Part 1 continued to emerge in Part 2. They were therefore presented in greater detail in the previous section and are not repeated here.

To examine the strength of assimilation across participants, an independent samples t-test was conducted comparing the accuracy of those in the prototype and non-prototype conditions. Participants given the prototype \( n = 24 \) did not differ from those not given the prototype \( n = 18 \) on matching ability, \( t(40) = -0.26, p = .793, d = -0.08 \). As such, results were pooled for subsequent analyses.

Overall accuracy on the sorting task was 72% \((SD = 27.84)\). The majority of participants had an accuracy rate \( \geq 80\% \). Despite the small sample size, exploratory statistical analyses were conducted to determine whether participant age affected accuracy on this task. Participants were grouped into age categories (6- to 8-year-olds and 9- to 11-year-olds). Younger children had a significantly lower level of accuracy \( n = 22, M = 62.12, SD = 25.23 \) than older children \( n = 20, M = 82.50, SD = 27.21 \), \( t(40) = -2.52, p = .016, d = -0.78 \). Although the sample size of this study precluded inferential analyses from being conducted at the individual age level, a nonparametric Spearman
rank-order correlation revealed that age was significantly and positively correlated with level of accuracy ($r_s = .41$). Additionally, visual inspection of Figure 2 (which displays mean accuracy across ages) suggests that accuracy—and therefore assimilation of objectification—appears to increase substantially from around age 7. These results should be treated with caution, however, as the moderate decrease in accuracy between 6- and 7-year-olds and 9- and 10-year-olds shown in the figure may reflect instability as a result of low sample size.

![Figure 2](image.png)

*Figure 2. Mean accuracy on the picture sorting task as a function of age*

Most participants reported that they grouped the objectified girls together because of their appearance, commenting specifically that the girls were “into fashion,” “all trying to be models,” trying to be “cool,” trying to be “fancy,” trying to be “older,” “showing off,” and “posing.” By contrast, consistent with the results from Part 1, most participants said they grouped the non-objectified girls together because of their mood and personality, commenting that they looked “nice,” “happy,” “friendly,” and
“normal.” Participants also reported that they grouped the non-objectified girls together because they did not look like the objectified girls; that is, the non-objectified girls were grouped together because they were not cool, not showing off, not posing, not trying to be older, not modelling, and not trying to be somebody else. These findings are illustrated in the following conversations:

Participant #41, 11 years, pictures of objectified girls
MJ: So why did you put these girls in the same group?
P: Umm they all put really like, cool clothes on
MJ: They all put really like cool clothes on. Anything else?
P: They like wear, some of them, wear jewellery and makeup and...
MJ: Some wear jewellery and makeup, yep
P: They dress like older people dress…like teenagers
MJ: Teenagers, yeah. And why do you think they would be friends?
P: They all try to look cool and impress other people

Participant #5, 6 years, pictures of objectified girls
MJ: Why do you think they would be friends?
P: Because they might all think that being sexy is good and they like the look of each [other] being sexy

Participant #38, 7 years, pictures of non-objectified girls
MJ: So why did you put all of these girls in the same group?
P: Probably because they don’t really want to be as cool and they looked a bit more kind than the others and they look a bit [like] friendly people and they look a bit more happier, not like trying to be really cool and bossy and teenager
MJ: Okay
P: Just being the way they are

As described in Section 8.3.4.2, a novel aspect of Part 2 was the added question (Question 7) examining whether participants felt pressured to dress a particular way by their parents. Most participants said that their parents would prefer them to look like the non-objectified girl rather than the objectified girl. When asked to explain why their
parents thought that way, participants reported that their parents like them just the way they are and would not like them to dress like the objectified girl because she was attempting to look older than her years:

Participant #28, 9 years, pictures of non-objectified girls
MJ: Well what about your mum and dad. Do you think your mum and dad would want you to look like this and dress like this?
P: Yeah
MJ: Why would you say that, why would, what would mum and dad like about this?
P: Because mum, my mum keeps on saying she doesn’t want me to be a teenager so…and the other pictures say that coz they [are] basically dressing like teenagers

Participant #31, 10 years, pictures of objectified girls
MJ: What about mum and dad?
P: No
MJ: No. Why not?
P: Because they don’t want me to look too cool and they would like me the way I am

8.5. Discussion

The present study sought to provide an in-depth understanding of how the concept of objectification is assimilated in young girls. This was achieved by quantitatively and qualitatively examining how young girls respond to and describe objectified and non-objectified depictions of their peers. Differing the presentation of objectifying and non-objectifying images across participants also made it possible to experimentally examine the strength of assimilation of objectification in this sample.

Participants given prototypes of objectified and non-objectified girls did not differ from participants not given these prototypes on their ability to match objectified and non-objectified depictions of their peers. This suggests that the assimilation of
objectification was strong across participants in both conditions and priming was not needed to accurately identify objectified images. This finding indicates that young girls may have already assimilated the objectification depicted in images to which they may be exposed and are aware (at least subconsciously) that there are differences between objectified and non-objectified peers.

There was a high degree of consistency in participant responses to the two types of pictures shown, allowing a number of propositions to be generated from the data. First, most participants made consistent attributions regarding the girls they viewed, using different categories of terminology to describe the non-objectified and objectified girls. While participants commented predominantly on the personality of the non-objectified girls, the reverse was found for objectified girls, who were discussed primarily in relation to their appearance. The finding that the appearance of the objectified girls dominated participants’ responses towards them to the exclusion of other characteristics suggests the objectified girls were being evaluated primarily based on this aspect. Given the definition of objectification as occurring whenever an individual’s body or body parts are regarded as being capable of representing the person as a whole (Bartky, 1990; Fredrickson & Roberts, 1997), it appears that participants did, indeed, readily objectify those girls depicted in an objectifying way. Although only visual data were available, and therefore it could be argued that appearance was the only attribute that could be used to describe and evaluate the girls in the pictures, the tendency for the non-objectified girls to be described and evaluated using predominantly mood and personality descriptors highlights the salience of the appearance of the objectified girls relative to the non-objectified girls.

Second, the finding that the objectified girls were predominantly and consistently described as “cool,” “fashionable,” and “stylish” suggests that although participants were unable to verbalise or articulate objectification as perhaps adults
would, they may have their own set of words to describe objectification. This finding is supported by a two-year ethnographic field study conducted by Rysst (2010) in Norway. In aiming to examine how sexualised clothing was understood by 10- and 11-year-old girls, Rysst (2010) found that although the term “sexy” was not used explicitly, the word “cool,” by contrast, was used often, with girls aware of the connection between being sexy and being cool and some girls translating sexy as cool. This indicates that for the girls in Rysst’s study, the word “sexy” was not yet a part of their vocabulary.

The same can be said when participants of the present study were presented with the objectifying pictures. Although they may not have been consciously aware of objectification or could not verbalise what objectification is, their varying interpretations of objectified girls compared to non-objectified girls point to a degree of assimilation and processing of objectifying content. The finding that overall accuracy for the sorting task was high amongst participants strengthens this proposition. This subconscious assimilation of objectification is an interesting finding that quantitative studies may not be able to uncover since, by their nature, they require an awareness of objectification (and an ability to verbalise this awareness) on the part of the participant; a requirement that may be difficult to meet for many children.

Third, although many participants appeared to be aware of the inappropriateness of the way the objectified girls were presented, they struggled to verbalise what it was about these girls that was inappropriate beyond the use of superficial, descriptive terms. Participants in the present study were of an age where they are likely to be in the concrete operational stage of cognitive development. It is also possible that some of the younger children may have been in the preoperational stage of cognitive development. As such, although most participants could reason logically about concrete events, they had not yet reached the formal operational stage of cognitive development where abstract logic and reasoning develops and children start to become capable of
hypothetical and theoretical thought (Piaget & Inhelder, 1969). As such, their ability to state that the objectified girls were inappropriate, for example because their belly was showing, but their inability to further reason as to why their belly showing was inappropriate, is reflective of their relative position in development. It is therefore likely that older children in the formal operational stage of cognitive development may be able to reason beyond a purely superficial level and may show greater refinement in their responses. An examination of this proposition in future research is warranted.

A fourth finding of interest to emerge from the interviews was the use of the objectified girls as a dissociative reference group. Dissociative reference groups include people that an individual would not like to be like (White & Dahl, 2006). By contrast, an associative reference group includes people who more realistically represent an individual’s equal, such as their peers (Gupta, 2009). Somewhat counterintuitively, despite many participants commenting that the objectified girls were cool, fashionable, and attractive to the opposite sex, most said that they did not want to befriend them, nor did they want to look like them. Although the latter was also said of the non-objectified girls, the reasons given differed. Specifically, participants did not want to look like the non-objectified girls because they preferred their own appearance, while they did not want to look like the objectified girls because they did not like the objectified girls’ appearance. In other words, the objectified girls became a dissociative reference group whereas the non-objectified girls were not given this distinction.

This dissociation may have arisen because of the perceived age of the objectified girls. Although the objectified girls were considered cool and fashionable (seemingly positive and aspirational characteristics), they were also frequently referred to as being older or being teenagers, despite being in the same age group as participants in the study. Indeed, although themes of childhood were frequently reported for the non-objectified girls (e.g., they were playing, happy, being themselves), themes of
adolescence frequently emerged for the objectified girls (e.g., they were cool, liked playing with boys, were attractive to boys, and spent their time on the phone chatting with friends or going to discos and parties). Quantitative analyses supported the finding that the objectified girls were considered significantly older than the non-objectified girls, with a mean age difference of approximately 6 years. As such, the assumption that the objectified girls were considerably older may have prevented them from being an associative reference group as they did not realistically represent the participants’ equals. One possible proposition from this finding is that as the children who thought the objectified girls were “cool” enter adolescence, they may start to see these girls as part of their reference group, and the desire to look like them and befriend them may increase.

The final finding of interest to emerge from the interviews was the conflict between the opinions of participants in the study and their assumptions of their friends’ opinions. Although many participants reported that they did not want to look like the objectified girls, they thought their friends would like to look like them. Furthermore, the reasons participants gave for their friends wanting to look like the objectified girls were often the same reasons participants themselves gave for not wanting to look like them. This conflict raises an interesting point. It could be that in asking about their friends’ opinions, participants felt they could “hide behind” these responses, unwittingly revealing their own desires and opinions. In other words, without the pressure of social desirability, participants may have more truthfully expressed their own thoughts. Although this point is difficult to assess, it does suggest that the desirability of an objectified “look” may be underestimated in children when they are asked specifically about their own opinions.

Support for this proposition is found in a recent study by Starr and Ferguson (2012). In this study, 6- to 9-year-olds were shown two dolls, one in revealing clothes
and the other in trendy yet covered-up clothes. Significantly more girls wanted to look like the sexualised doll and thought the sexualised doll was the most popular (70% and 72% respectively). Perhaps the dolls used in Starr and Ferguson’s (2012) study, as opposed to the pictures of real people used in the present study, allowed younger children to feel more comfortable in selecting the sexualised doll as something they would like to look like.

The conflict between participants’ stated opinions and their assumptions of their friends’ opinions suggests that if media literacy program developers and those involved in the psychological care of children (such as parents, child psychologists, school psychologists, and teachers) wish to accurately examine objectification or any sensitive body image issues, it may be valuable to take an indirect, and more subtle, approach to questioning. Failure to do so may result in an overall underestimation of these issues in children, leading researchers to the erroneous conclusion that a child is not affected by objectification or other media ideals (and therefore not at risk of developing the negative psychological consequences the internalisation of these ideals entails).

8.5.1. Limitations. Several methodological limitations need to be noted. The first is the absence of counterbalancing in the protocol. Children may have been fatigued towards the end of the interview, resulting in a deterioration of motivation on the final questions. This may have been exacerbated by some questions appearing repetitive at face value. This was not observed however, with most girls excited to see the various pictures presented throughout the interview. The absence of counterbalancing may have also worked in the opposite direction. Specifically, more consistent responses may have been obtained in the latter stages of the interview because participants were primed in Part 1 to think about appearance and objectification. As such, participants may have been more accurate in the grouping task
and better at verbalising their thoughts as the interview progressed, resulting in an overinflated assessment of objectification assimilation.

A second limitation concerns the coding process of the present study. Independent raters did not code participant responses for themes and, as such, a measure of interrater agreement could not be calculated. Although, as described in Section 8.3.5, one of the candidate’s supervisors reviewed the coding hierarchy and agreed that the coding process was logical and reflective of the interview content, the possibility of researcher bias remains.

A third limitation concerns the images used to depict objectified and non-objectified peers in the present study. Difficulties were experienced obtaining images that were comparable on all variables with the exception of objectification. Although the majority of images used were matched on extraneous variables, some images did differ. For example, in the images shown in Figure 1, the non-objectified girl is smiling whilst the objectified girl is not. It can therefore be argued that it is not surprising the non-objectified girl was more frequently described as “happy” and “cheerful” than the objectified girl. Although this represents a potential confound, the consistency of findings across all parts of the present study suggests that the few images that could not be matched did not significantly influence the study’s findings. Additionally, it has been suggested that pouting can be considered a body language that is indicative of sexual availability (Erchull, 2013). The differing facial expressions of the girls depicted in Figure 1 can therefore be considered a part of the objectification criteria used to distinguish them.

Other limitations of the present study are those that arise as a result of conducting qualitative studies generally. For instance, in qualitative studies, researchers do not have the same degree of control over other influencing variables, and research is often based on small sample sizes, limiting the ability to generalise findings to the wider
population (McDermott, Hastings, Stead, Carrigan, & Harris, 2008). However, although only 42 interviews were conducted, more interviews would not necessarily have delivered different results. Qualitative research, by its very nature, is also dependent on the interpretations and judgements of the individual researchers. The candidate is a white, middle-class female with a background in clinical psychology, and these characteristics may have influenced the level of rapport established with individual participants, the nature of participants’ responses, and the way the data were interpreted. Replication of this study by other researchers is recommended to overcome this potential limitation.

Finally, it has been suggested that qualitative research is dependent on the self-report of participants, with responses to open-ended interview questions reflecting only what participants thought of at the time (McDermott et al., 2008). However, the same can be said of quantitative studies. Although this may result in an underestimate of less prominent attitudes and opinions that may have emerged had they been directly inquired about, a strength of the present study is the findings that emerged as a result of not directly enquiring about objectification, but rather simply asking open-ended questions about a particular stimulus.

8.5.2. Strengths. The present study had a number of methodological strengths. First, the use of a mixed-method qualitative and quantitative design allowed for methodological triangulation. Second, the use of innovative methods, chosen specifically because of the sensitive nature of the topic and the difficulties accessing the thoughts and feelings of children, made it possible to examine the assimilation of objectification and implicit attitudes towards objectifying content in a children sample. As little is known about how children perceive objectifying content, the present study has enriched previous quantitative analyses examining the consequences of objectification with a qualitative examination of the processing of objectification. This
was achieved in the context of face–to–face private interviews which allowed for the
establishment of rapport with participants, an important factor that increases motivation
and cooperation with the interview process (Goldman & Goldman, 1982).

Despite these strengths, the area under investigation in the present study would
benefit from continued research. Specifically, although preliminary evidence from
Murnen et al. (2003) suggests that rejectors of objectifying pictures have higher body
esteem compared to acceptors of objectifying pictures, research that more clearly
examines the link between perceptions of objectifying content and the psychological
consequences of objectification in children is needed. Additionally, given the limited
understanding of objectification in boys, in-depth and mixed-method studies are needed
in this population. Most of the research examining objectification has been conducted in
females, primarily because various studies of objectification have framed the
phenomenon as an issue that predominantly affects females (e.g., Fredrickson &
Roberts, 1997; Noll & Fredrickson, 1998). As such, there is a paucity of theoretical and
empirical work that has addressed objectification in males, despite evidence suggesting
that objectification does occur in males and is increasing (H. G. Pope et al., 2001;
Reichert et al., 1999). Studies that allow for information relevant to males to emerge
from the data are needed.

8.5.3. Conclusion. Results of the present study suggest that girls, even those as
young as 6 years of age, may have already assimilated objectification and developed
some implicit attitudes towards objectifying content. This assimilation appears to
increase with age, with the present findings pointing to a developmental progression
towards greater awareness and a clearer understanding of objectification as girls
approach preadolescence. In providing an in-depth understanding of how the concept of
objectification is assimilated in young girls, this study represents important exploratory
work that has the ability to inform parents and teachers of the degree to which young
girls may be influenced by objectifying content. The present study also has implications for the development and implementation of media literacy programs designed to address objectification. Specifically, implementation of these programs in adolescence may be too late, a proposition discussed in greater detail in the next chapter.
Chapter 9. General Discussion

9.1. Overview

This chapter reviews the results from Studies 1, 2, and 3, and how findings from these studies relate to the aims and predictions of the overall thesis. It also considers the implications of these results from theoretical and practical perspectives. Specifically, this chapter aims to (a) summarise the results from the empirical studies as they relate to the aims and hypotheses formulated in Chapters 1 and 2, (b) evaluate the strengths and implications of this thesis, and (c) consider the limitations of this thesis and discuss possible directions for future research. As attention has already been paid to the methodological strengths and limitations of each study and substudy (see Chapters 3 through 8), the focus here will primarily be on the strengths and limitations of the thesis at an overall level. Attention will also be paid to any methodological limitations not previously discussed in detail.

9.2. Results from Empirical Studies

As noted in Chapter 1 (Section 1.1), central to this thesis were the following overarching propositions:

1. Self-objectification is a risk factor in the development of body image disturbance and eating disorder symptoms in children.

2. Interactions between the consequences of self-objectification, such as habitual body monitoring, body shame, and weight and shape concern, form complex models that explain the relationship between self-objectification and eating disorder symptomatology in children.

Accordingly, the primary aim of this thesis was to prospectively investigate the hypothesised contribution and etiological significance of self-objectification in the development of body image disturbance and eating disorder symptoms in children. To achieve this aim, three separate studies were conducted.
9.2.1. Study 1: A psychometric evaluation of measures of self-objectification and objectified body consciousness in young children. Validated self-objectification scales for use with children are lacking. To begin the process of developing measures of self-objectification, body surveillance, and body shame in children, Study 1 aimed to modify and evaluate the Objectified Body Consciousness Scale for Youth (OBC-Y) and the Self-Objectification Questionnaire (SOQ) in an Australian sample of 6- to 11-year-old children. Specifically, Study 1 sought to: (a) confirm the factor structure of the modified OBC-Y; (b) examine estimations of internal reliability and convergent validity for scores obtained from modified versions of the OBC-Y and SOQ; and (c) examine the relationship between these two measures and gender, body mass index $z$-score (BMI $z$-score), and age.

9.2.1.1. Summary of results and implications. Findings from Study 1 suggest that scores on the modified OBC-Y and SOQ may be valid and reliable measures of body surveillance, body shame, and self-objectification in children. In addition to performing satisfactorily in confirmatory factor analysis, scores on the Body Shame and Body Surveillance subscales of the OBC-Y correlated significantly with scores on the SOQ indicating adequate convergent validity of scores on both measures. The reliability of scores on the Body Surveillance and Body Shame subscales of the OBC-Y was also considered adequate for research purposes, at least in girls. In boys, reliability of scores on the Body Shame subscale was questionable. As described in Chapter 3 (Section 3.5.2.1), it is likely that a lack of awareness and understanding of body image issues, and a lack of salience of the concept of body shame in boys, resulted in the questionable reliability. The small number of items on both subscales likely contributed to the adequate reliability levels overall. Long questionnaires are difficult to administer in children, however, as children become easily fatigued and distracted during long assessments (Ricciardelli & McCabe, 2001a). Researchers may therefore judge the
A moderate trade-off with respect to reliability to be acceptable. It is worth noting that an examination of the reliability of scores on the subscales of the OBC-Y in the sample from Study 2 revealed that in this sample overall, reliability was adequate for scores on both subscales, and adequate to excellent in both boys and girls. This indicates that scores on these subscales may indeed be adequately reliable.

In support of the gender differences inherent in body image disturbance (Calogero & Thompson, 2010; Fredrickson et al., 1998; Striegel-Moore & Smolak, 2002), and supporting a core tenet of objectification theory (that gender is a key influence in individuals’ experiences of self-objectification), girls reported significantly more body surveillance than boys. This finding extends previous research by providing evidence that the gender difference in body surveillance may emerge earlier than has previously been reported, with girls reporting more body surveillance than boys by age 6. In support of Lindberg et al.’s (2006) suggestion that gender differences in body shame may have not yet emerged in preadolescents and children, there were no significant differences between boys and girls in regards to body shame. As described in Chapter 3 (Section 3.5.3.1), perhaps gender differences in body shame are more likely to emerge in adolescence when physical maturation and the associated body changes during adolescence (specifically, the significant gain of body fat around the hips and thighs) move girls away from the ideal body type valued by society whilst simultaneously moving boys towards the masculine ideal by increasing muscle mass and lean tissue (Clifford, 1971; Levine & Smolak, 2002; Stice, Hayward, et al., 2000; Striegel-Moore et al., 1986). Research on 12- to 16-year-old boys and girls by Slater and Tiggemann (2010) supports the suggestion that gender differences in body shame emerge at a later age, with adolescent girls in their study reporting significantly greater body shame than adolescent boys.
Despite girls in Study 1 reporting significantly greater body shame than boys, analyses involving body mass index z-score (BMI z-score) revealed that BMI z-score and body shame were significantly and positively correlated in both boys and girls. This suggests that boys with a larger body size may be especially vulnerable to experiencing body shame, and should not be ignored in investigations of body shame and body image disturbance.

Although it was hypothesised that older children would report greater body surveillance, body shame, and self-objectification than younger children (due to the developmental changes that occur between childhood and adolescence and the increasing awareness of societal ideals at this age), Study 1 found the opposite. Age was significantly and negatively correlated with body surveillance, body shame, and self-objectification in girls, and significantly and negatively correlated with body surveillance and self-objectification in boys. Possible reasons for this unexpected finding were discussed in detail in Chapter 3 and as such are not examined in detail again here. Briefly, reductions in the reported importance of weight in boys and girls aged 8 to 12 years have also been observed by McCabe and Ricciardelli (2005), with these reductions considered by McCabe and Ricciardelli to be consistent with developmental changes in children’s self-concept. They argued that in the first few years of primary school, children increasingly engage in social comparisons and, as a result, there is a decrease in children’s evaluations of their self-worth and abilities. As children begin to balance these social comparisons with other personal achievement goals, their self-evaluation becomes more positive. McCabe and Ricciardelli posited that this shift occurs at around Grade 4, or age 9. It is therefore possible that younger children are more susceptible to messages regarding shape and weight because they are engaging more than older children in outward social comparisons to gauge self-worth and/or may have not yet learnt to base their self-worth on other personal achievements,
such as academic ability. The lower levels of body shame, body surveillance, and self-objectification reported by older children in Study 1 may therefore reflect the increasingly positive self-evaluations that seem to occur in late childhood.

Although it is also possible that the cognitive ability and communication skills of participants in Study 1 may have potentially created differences in the reliability of responses across the age groups of children investigated, the results of Study 1 nevertheless highlight the importance of examining body shame, body surveillance, and self-objectification in children. It is therefore recommended that researchers do not ignore the possible occurrence of these disturbances in younger age groups.

9.2.1.2. Conclusion. The psychometrically sound examination of body surveillance, body shame, and self-objectification in children is critical to the examination of objectification theory as it pertains to the development of disordered eating in children, and is therefore also critical to achieving the overall aims of this thesis. Given the results of Study 1 suggest that scores on the OBC-Y and SOQ may provide researchers with psychometrically sound measures of the key components of objectification theory (body surveillance, body shame, and self-objectification) in children, this study serves to facilitate future research investigating objectification theory as it applies to the development of disordered eating in children.

9.2.2. Study 2. As discussed in Chapter 2 (Section 2.5), although there is considerable empirical support for the validity of objectification theory as it applies to eating disorders in older adolescents, undergraduates, and other adults, several gaps exist in the current literature. First, although there has been a great deal of public discourse regarding the objectification of children, there is a lack of empirical data in relation to the role of self-objectification in the development of eating disorders in this population. Second, much of the empirical research to date has focused predominantly on females to the exclusion of males. Third, the majority of studies have only examined
the relationships among the set of variables specifically posited by objectification theory (e.g., Calogero, 2009; Greenleaf & McGreer, 2006; M. S. Hill & Fischer, 2008; Kozee et al., 2007; Tiggemann & Kuring, 2004; Tiggemann & Lynch, 2001; Tiggemann & Williams, 2012; Tylka & Hill, 2004). However, other variables, such as self-esteem, may act as moderators of the relationship between self-objectification, body image disturbance, and disordered eating, and should therefore be examined, particularly if they act as protective factors within the objectification theory framework. Finally, objectification theory has not been examined extensively within the context of large-scale prospective designs. A prospective design would allow for greater confidence in the directional hypotheses proposed by objectification theory whilst also allowing for a greater understanding of the underlying mechanisms involved in the development of body surveillance, body shame, appearance anxiety, body dissatisfaction, and eating disorder symptomatology over time.

Given these limitations of previous research, Study 2 aimed to extend and adapt the objectification theory framework to younger samples by longitudinally examining the relationship between self-objectification and dietary restraint (as specified by objectification theory) in both boys and girls. Specifically, the four substudies of Study 2 aimed to (a) examine objectification theory in boys and girls and determine whether it follows the same mediational model observed in older populations and (b) examine whether self-esteem acts as a protective factor within the objectification theory framework.

9.2.2.1. Study 2a: Self-objectification, body image disturbance, and eating disorder symptoms in young Australian children. The evidence presented in Chapter 2 (Section 2.5) provided support for the suggestion that children may be vulnerable to the development of self-objectification. However, a comprehensive review of the literature revealed that researchers have yet to determine whether children do self-objectify. This
makes it difficult to determine whether children are vulnerable to messages of objectification, and whether the various findings relating to self-objectification in adults can be extended to children. Given that previous research was also found to be hampered by the varying methods used to assess body image disturbance and eating disorder symptoms in children, and by the widely varying, and predominantly small, sample sizes used in these studies, Study 2a sought to examine the degree to which a sample of 6- to 11-year-old boys and girls self-objectify, and the prevalence of body image disturbance and eating disorder symptoms in this population. A secondary aim of the study was to examine gender and weight category differences in self-objectification, body image disturbance, and eating disorder symptomatology.

9.2.2.1.1. Summary of results and implications. A considerable degree of overlap between self-objectification scores obtained by young girls and those obtained by adolescents and adults in previous investigations of self-objectification was found in Study 2a, suggesting that the degree to which young girls self-objectify is similar to the degree to which older females self-objectify. This supports the proposition that young girls, like adults, are vulnerable to the messages of objectification that permeate Western societies. Given objectification theory purports that the existence of the individual psychological process of self-objectification is crucial to the development and maintenance of body image disturbance, disordered eating, and other psychopathology (Fredrickson & Roberts, 1997; O'Riordan & Zamboanga, 2008), an investigation of the consequences of self-objectification in young girls, such as that conducted in Studies 2b and 2c of this thesis, is warranted.

Although self-objectification scores obtained by young boys in Study 2a did not overlap with scores obtained by older males in other studies, the paucity of research examining self-objectification in males precluded multiple comparisons from being conducted. Although objectification theory was initially proposed as a framework for
understanding females’ experiences with objectification, consistent with Study 1 and research by Morry and Staska (2001), Study 2a found that gender did not influence self-objectification. It is worth noting, however, that as discussed in Section 9.2.1.1, the absence of a gender difference in self-objectification may be reflective of the younger age of participants sampled in this study. Perhaps gender differences in self-objectification emerge in adolescence when body changes move girls away from the ideal whilst moving boys towards the ideal, creating a situation whereby salience of the body is increased for females.

Study 2a also found that self-objectification scores were not influenced by weight category, consistent with objectification theory which states that self-objectification can affect all individuals regardless of weight status (Calogero et al., 2005; Fredrickson & Roberts, 1997; Fredrickson et al., 1998; Myers & Crowther, 2007; Tiggemann & Lynch, 2001). Overweight/obese children were, however, significantly more likely than healthy-weight children to report body dissatisfaction and body shame, supporting this study’s hypothesis that the consequences of self-objectification will affect those with a larger body size to a greater extent. This finding also supports previous cross-sectional and longitudinal research (e.g., Blowers et al., 2003; Jones et al., 2004; Knauss et al., 2008; Lawler & Nixon, 2011; McCabe et al., 2009; Sinclair, 2006). Although overweight/obese children also reported significantly higher body dissatisfaction scores than healthy-weight children, significant levels of body dissatisfaction were reported by healthy-weight participants. Desire for a thinner figure in this subpopulation may be especially problematic as weight loss may result in malnutrition and other physical problems (Gowers et al., 1991; Higgs et al., 1989; Mallick, 1983; Pugliese et al., 1983; Zipfel et al., 2001).

Although significantly more girls than boys desired a figure thinner than their perceived figure, a substantial proportion of boys selected an ideal figure that was
thinner than their perceived figure. This suggests that a singular focus on muscularity in this population could distort the importance of this one aspect of body image, leading to an inadequate exploration and understanding of other important body image factors in males, such as weight concerns (Jones et al., 2008).

With respect to eating disorder behaviours, a significant minority of children were found to have acted on their body dissatisfaction and weight concerns in the four weeks prior to the assessment. Specifically, this study found that (a) a significant minority of children had a score on the ChEDE Global scale that was more than 1 standard deviation above the mean on community norms, indicating that they experience symptoms of a subclinical severity, and (b) a significant minority of children reported engaging in binge eating. These findings suggest that even at this young age the foundations may be laid for the development of eating disturbances, with certain subpopulations (such as overweight children) at particular risk for the subsequent development of disordered eating. The prevention of body image disturbance in children therefore appears to be crucial in the prevention of maladaptive weight loss practices.

9.2.2.1.2. Conclusion. From a theoretical perspective, Study 2a appears to be the first study to directly examine self-objectification in young boys and girls. Collectively, findings suggest that body ideals and dietary behaviours are embedded in the lives of both girls and boys at an early age. Given the known physical implications of these disturbances on nutritional development, and the suggestion that negative body image, regardless of BMI, increases the risk of subsequent depression (Levine & Smolak, 2002) and eating disorders (Polivy & Herman, 2002; Stice, 2002), future work on self-objectification and the validity of objectification theory in children is imperative. Study 2b, now described, began the process of conducting this work.
9.2.2.2. Study 2b: A test of objectification theory in children. Study 2b sought to examine the underlying mechanisms that contribute to the development of body image disturbance and eating disorder symptoms by cross-sectionally and prospectively examining objectification theory in a sample of primary-school-aged children. Specifically, Study 2b aimed to cross-sectionally and prospectively examine, using structural equation modelling techniques, two theoretical models of objectification theory (original and comprehensive). A secondary aim of Study 2b was to examine gender differences in the pathways posited by objectification theory. It was hypothesised that (a) the causal pathways posited by objectification theory and tested empirically by Tiggemann and Lynch (2001) would be supported in children, with the cross-sectional models providing an overall good fit to the observed data, and (b) the nature of the relationships posited by objectification theory would not differ between boys and girls.

In examining objectification theory in the context of a prospective design (and utilising structural equation modelling techniques to test the predictive power of this theory), a demonstration of precedence was obtained and underlying mechanisms explored. This allowed Study 2b to address the overarching hypotheses of the broader thesis: That self-objectification is a risk factor in the development of eating disorder symptoms in children, and that interactions between the consequences of self-objectification, such as habitual body monitoring, body shame, and weight and shape concern, form complex models that explain the relationship between self-objectification and eating disorder symptomatology in children.

9.2.2.2.1. Summary of results and implications. Results from Study 2b provided direct support for the validity of objectification theory in children, with both the original and comprehensive models of objectification theory providing a good account of dietary restraint in children (at least cross-sectionally). The original model was a better fit to the
data, however, meeting all the requirements outlined for excellent fit. This original model accounted for 40% of the variance in dietary restraint, whilst the comprehensive model accounted for only 29% of the variance in dietary restraint, suggesting that the more parsimonious original model should be retained over the comprehensive model.

Although both these models accounted for less variance in disordered eating than did Tiggemann and Lynch’s (2001) and Tiggemann and Williams’ (2012) investigations (a difference stemming perhaps from variations in the conceptualisation of eating disorder symptoms), several of the pathways posited by objectification theory emerged as significant. Providing direct support for the relationship between self-objectification and disordered eating, self-objectification was positively associated with body surveillance, body surveillance was positively associated with both body shame and weight and shape concern, and weight and shape concern was positively associated with dietary restraint (significantly mediating the relationship between body surveillance and dietary restraint, as hypothesised by objectification theory). The finding that weight and shape concern was associated with dietary restraint to a greater degree than body shame complements the results from previous studies of objectification theory (Tiggemann & Lynch, 2001; Tiggemann & Williams, 2012). Significant positive pathways were also found between body surveillance and body dissatisfaction, and between BMI z-score and weight and shape concern, body shame, and body dissatisfaction.

The significance of these pathways in children suggests that objectification theory may indeed be applied to this population, with continual comparisons to an internalised ideal through body monitoring resulting in boys and girls experiencing body image disturbance in the form of body dissatisfaction, body shame, and weight and shape concern. This suggests that when children recognise that their bodies are subject to external evaluation by others, internalise this external evaluation of the self,
and compare their bodies to internalised cultural ideals, they may also come to experience body image disturbance. These findings therefore support the second overall hypothesis of this thesis: that interactions between the consequences of self-objectification, such as habitual body monitoring, body shame, and weight and shape concern, form complex models that explain the relationship between self-objectification and eating disorder symptomatology. These findings also support research in early adolescent girls and boys (Grabe et al., 2007), undergraduate males and females (Calogero, 2009; Greenleaf & McGreer, 2006; Kozee et al., 2007; Mercurio & Landry, 2008; Moradi et al., 2005; Tiggemann & Kuring, 2004), and adult women (Augustus-Horvath & Tylka, 2009; McKinley, 2006) that has found that self-objectification and its negative psychological consequences are key predictors of body image disturbance and eating disorder symptomatology.

Prospectively, both the original and comprehensive models under investigation provided suboptimal solutions to the data. Although the original model accounted for a greater proportion of the variance in dietary restraint in cross-sectional analyses, the comprehensive model accounted for a greater proportion of the variance in dietary restraint in prospective analyses, suggesting that this model is better suited to predicting the development of dietary restraint, whilst the original model is better suited to predicting the maintenance of dietary restraint. As discussed in Chapter 5, however, several reciprocal relationships between the variables posited by objectification theory were indicated, suggesting that the directional relationships posited by objectification theory should perhaps not be viewed as fixed over time, but rather as interrelated associations with possible feedback loops and vicious cycles.

Although few pathways within the prospective models were significant, the expected association between body shame and dietary restraint was identified in both models. Given that body shame was not significantly associated with dietary restraint
cross-sectionally, this finding suggests that body shame is more important in the development of dietary restraint than in its maintenance. It also supports body shame as a risk factor for dietary restraint, with this variable meeting two of the stringent criteria outlined by Kraemer et al. (1997) to be necessary in the determination of risk, specifically that the variable temporally precedes, and is significantly associated with, the outcome of interest.

In the comprehensive test of the model, body surveillance was found to prospectively predict body dissatisfaction with body dissatisfaction, in turn prospectively predicting dietary restraint. This suggests that how children view their bodies is important in the development of body image disturbance and maladaptive weight-loss practices. The significant relationship between body surveillance and body dissatisfaction is not surprising given that body surveillance is analogous to body checking and frequent body checking may serve to reinforce body dissatisfaction and feelings of fatness by directing excessive attention to the body (Reas, Whisenhunt, Netemeyer, & Williamson, 2002; Shafran, Lee, Payne, & Fairburn, 2007).

A possible developmental influence was indicated, with measurement invariance analyses revealing that the relationship between weight and shape concern and dietary restraint significantly increased over time, especially between T1 and T2. As discussed in Chapter 5, the localisation of this increasing association between weight and shape concern and dietary restraint at ages 8 to 9 suggests that programs aiming to prevent eating disorders should be implemented in early- to middle-childhood to more effectively reduce this association. This is discussed in greater detail in Section 9.4.

Although these results support the role of self-objectification and its negative psychological consequences in the development of dietary restraint, it is worth noting that a large proportion of the variance in dietary restraint remained unaccounted for. This is consistent, however, with the idea that there are multiple pathways to dietary.
restraint (not all of which stem from weight- and shape-related concerns) and that
different variables may be associated with, and/or predict the onset of, dietary restraint
in children. It would be worthwhile examining whether the effects of self-objectification
extend to other forms of eating disorder symptoms (such as purging, binge eating, or
driven exercise for weight control). These outcomes were unable to be examined in this
study given the low prevalence of these symptoms in the participants sampled.

Results from Study 2b need to be interpreted in the context of several identified
gender differences. A significantly stronger association between T1 body surveillance
and T1 weight and shape concern, and between T2 body shame and T3 dietary restraint
was found in girls, whilst a significantly stronger association between T1 weight and
shape concern and T1 dietary restraint was found in boys. As described in Chapter 5,
this suggests that the experience of body shame in girls is more important in the
development of future dietary restraint than it is for boys, supporting the suggestion that
females are more likely than males to be sensitive towards messages of slimness, and
are therefore more likely to adopt the traditionally feminine behaviour of pursuing
physical attractiveness (Striegel-Moore & Smolak, 2002). However, it is worth noting
that these relationships were still significant in boys, and all other relationships, both
cross-sectional and longitudinal, were not moderated by gender (supporting research by
Choma et al., 2010; Grabe et al., 2007; Lawler & Nixon, 2011; Ricciardelli et al., 2000;
and Slater & Tiggemann, 2010). This indicates that most aspects of objectification
theory are relatively comparable and applicable to both sexes, suggesting that
objectification theory is not a theory that should be exclusively applied to females.
Given these findings, it is important that future researchers of eating disorder symptoms
be cognizant of the similarities across genders, and be careful not to ignore body image
disturbance and eating disorder symptoms in males.
Results from Study 2b also need to be interpreted in the context of individual differences. Individuals identify differently with the multiple, widely disseminated discourses that exist socially and culturally (Piran & Cormier, 2005) and, as such, the degree to which individuals self-objectify will also vary (Fredrickson & Roberts, 1997). This explains why vulnerability to objectification may not exist in all individuals (Williams et al., 2003). Additional attention given to what increases vulnerability to self-objectification may be beneficial. The consideration of how psychosocial and genetic factors interact to produce different eating disorder features is also worthy of attention, given that a substantial proportion of the variance (between 45% and 72%) in subclinical eating disorder symptoms may be attributable to genetic factors (Klump, McGue, & Iacono, 2000; Sullivan, Bulik, & Kendler, 1998; Wade et al., 1999).

9.2.2.2. Conclusion. Study 2b appears to be the first study to cross-sectionally and prospectively examine objectification theory as it pertains to the development of dietary restraint in children. As discussed, results suggest that self-objectification and its negative psychological consequences of body surveillance, body shame, weight and shape concern, and body dissatisfaction are important cross-sectional and prospective predictors of eating disorder symptomatology (specifically, dietary restraint) in both boys and girls. These findings, in a sample of this age, suggest that treating body image disturbance in adolescence may be too late, and that a failure to develop media literacy skills at an early age may make boys and girls more vulnerable to the social norms and expectations that have been engendered by unrealistic and unattainable media images. Additional prospective research on the objectification theory framework, with a more ethnically diverse sample, a broader conceptualisation of disordered eating, and an extended age range of participants, is required to further clarify the nature of the associations between the variables posited by objectification theory and to capture crucial periods of development. It is possible that the results obtained in Study 2b would
differ if analyses were repeated with adolescents, underscoring the need for research on
developmental shifts and their influence on the relationships posited by objectification theory.

9.2.2.3. Study 2c: An extended test of objectification theory in children: The
addition of depressed mood. Although the primary focus of this thesis was the
examination of objectification theory as it pertains to the development of eating
disorders, objectification theory also posits the etiological significance of self-
objectification in the development of depression. However, despite several postulated
mechanisms by which depression could result from self-objectification, few
examinations of objectification theory as it pertains to both disordered eating and
depression have been conducted to date. Accordingly, Study 2c broadened the
investigations of Studies 2a and 2b by prospectively investigating the hypothesised
contribution and etiological significance of self-objectification in the development of
both eating disorder symptoms and depressed mood in children, a population that does
not appear to have been studied in this area. Specifically, Study 2c sought to (a) cross-
sectionally and prospectively examine the role of self-objectification in the development
of both dietary restraint and depressed mood, (b) examine the relationship between
dietary restraint and depressed mood within the objectification theory framework, and
(c) examine gender differences in the relationships between the variables under
investigation. It was hypothesised that: (a) the causal pathways posited by
objectification theory, and tested empirically by Tiggemann and Kuring (2004) and
Tiggemann and Williams (2012), would be supported in children; (b) significant
comorbidity would be observed between depressed mood and dietary restraint; and (c)
the nature of the relationships posited by objectification theory would not differ between
boys and girls.
9.2.2.3.1. Summary of results and implications. Results from Study 2c provided direct support for the validity of objectification theory in children, with the hypothesised cross-sectional model providing an excellent fit to the observed data and accounting for 38% of the variance in depressed mood. Indeed, the model accounted for a greater proportion of the variance in depressed mood than dietary restraint (28%). In addition to the significant pathways uncovered in Study 2b, body shame was found to be significantly associated with depressed mood, with body shame significantly mediating the relationship between body surveillance and depressed mood. This supports research by Tiggemann and Kuring (2004) and Tiggemann and Williams (2012) and suggests that body image disturbance may influence psychological well-being.

The prospective test of the model provided a suboptimal fit to the data. Despite 91% of the variance in depressed mood being accounted for, none of the specified prospective relationships leading to depression mood emerged as significant. An unspecified prospective relationship did emerge, however, with T1 body shame significantly predicting T2 depressed mood. As described in Chapter 6, this suggests that the importance of body shame in predicting the development of depressed mood may be greater at a particular stage of development, after which body shame may become more important in the maintenance of depressed mood. Given the mean age of participants at T1 and T2, the predictive utility of body shame appears to be strongest between the ages of 8 and 9.

Although the relationship between T2 body shame and T3 depressed mood was not significant, examination of possible gender differences revealed that, in contrast to the study’s hypothesis, the specified relationship between T2 body shame and T3 depressed mood was significant in girls but failed to reach significance in boys. This indicates that body shame exerts a differential risk for girls and boys, and suggests that the ability of objectification theory to account for the development of depressed mood
in boys may be limited. Specifically, the socialisation that leads girls to habitually monitor their bodies, and in turn develop negative psychological consequences and depressive symptomatology, does not appear to be at work for boys, with body image disturbance playing a greater role in the development of depressed mood in girls.

Despite the significant comorbidity between depression and eating disorders observed in previous studies (Blinder et al., 2006; Braun et al., 1994; Geist et al., 1998; Herzog et al., 1992; Hudson et al., 2007; Jordan et al., 2008), Study 2c did not find a significant relationship between dietary restraint and depressed mood. However, the absence of a relationship may have been due to the conceptualisation of eating disorder symptomatology used in Study 2c. As discussed in Chapter 6, previous research by Kostanski and Gullone (1999) found that although a significant relationship exists between body image dissatisfaction and dieting, the correlation between these two constructs is low overall. They suggested that body image dissatisfaction and dieting are largely disparate concepts, with body image dissatisfaction representing the internalisation of negative cognitions about the self, and dieting representing the adoption of restrictive eating behaviours. A similar distinction between depressed mood and dietary restraint may have been present in Study 2c, with depressed mood representing negative cognitions about the self, the world, and others, and dietary restraint representing the adoption of weight-loss behaviours. A broader operationalisation of eating disorder symptomatology may be beneficial to future research. An investigation of whether depressed mood interacts with body shame and/or weight and shape concern to produce eating disorder symptoms (as opposed to influencing the development of eating disorders symptoms directly), is also worthy of attention.

9.2.2.3.2. Conclusion. Study 2c prospectively examined objectification theory as it pertains to the development of both dietary restraint and depressed mood in children.
As discussed, the model of objectification theory provided a satisfactory account of how the variables of self-objectification, body surveillance, body shame, and weight and shape concern interrelate to produce dietary restraint and depressed mood in children. Prospectively, it appears the affective processes surrounding children’s psychological investment in their appearance (i.e., body shame) create the greatest vulnerability for depression, although there is a need for additional research examining the role of self-objectification and its negative psychological consequences in the development and maintenance of depressed mood in boys.

### 9.2.2.4. Study 2d: Protective factors within the objectification theory framework: The role of self-esteem

Studies 2a to 2c of this thesis focused on the risk factors of disordered eating and depressed mood specified by objectification theory. As discussed in Chapter 7, however, it is important to move beyond the risk factors and start investigating possible mechanisms of change within these models that may serve to decrease the associations between the pathways of interest and, ultimately, decrease the incidence of dietary restraint and depressed mood in boys and girls. Accordingly, Study 2d took a different approach to previous investigations by focusing on self-esteem as a possible protective factor within the objectification theory framework. Specifically, Study 2d sought to examine whether self-esteem serves as a protective variable that moderates the strength of the putative risk factors of body image disturbance and eating disorder symptomatology.

Study 2d also moved beyond investigating the role of self-objectification in the development of body image disturbance and eating disorder symptomatology towards an examination of the influence of self-objectification on overall feelings of self-worth. As such, the primary aims of this study were to cross-sectionally and prospectively examine (a) the role of self-objectification and its negative psychological consequences in the development of low self-esteem, (b) the predictive utility of self-esteem in the
development of self-objectification and its negative psychological consequences, and (c) the role of self-esteem as a protective factor within the framework of objectification theory. A secondary aim of this study was to examine gender and weight category differences in self-esteem, as well as changes in self-esteem over time. It was hypothesised that: (a) self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood would be negatively associated with self-esteem; (b) self-esteem would moderate the relationships posited by objectification theory; and (c) overweight children and girls would report lower self-esteem than healthy-weight children and boys.

9.2.2.4.1. Summary of results and implications. Results from Study 2d revealed that a significant minority (17%) of children reported lower than average or much lower than average self-esteem, supporting previous research by McGee et al. (2001). Cross-sectionally, depressed mood was the most robust predictor of self-esteem in this study, with depressed mood also predicting self-esteem category. Those who reported greater depressed mood were more likely to be in the much lower than average, lower than average, and average self-esteem groups than in the above average self-esteem group. Conversely, self-esteem cross-sectionally predicted depressed mood, with this relationship stronger in boys compared to girls. Above average self-esteem levels were also associated with significantly lower levels body dissatisfaction and depressed mood.

Supporting the first hypothesis of this study (that self-objectification, body surveillance, body shame, weight and shape concern, body dissatisfaction, dietary restraint, and depressed mood would be negatively associated with self-esteem), and previous research by Friestad and Rise (2004), Mendelson et al. (1996), and Tiggemann (2005a), body shame was the most robust prospective predictor of self-esteem, with T2 body shame emerging as a significant negative predictor of T3 self-esteem. This finding needs to be interpreted in the context of gender differences, however, as T2 body shame
prospectively predicted T3 self-esteem in girls only. This suggests that, in girls, self-esteem appears to be heavily influenced by body image disturbance (specifically, body shame), particularly between the ages of 9 and 11. Programs aiming to improve psychological well-being in children and reduce individual vulnerability to psychopathology should therefore be implemented around this age, with particular attention given to the strong influence of body image disturbance in the at-risk subpopulation of girls.

In reversing, and subsequently examining, these prospective associations, results revealed that self-esteem prospectively and negatively predicted weight and shape concern and depressed mood (albeit at a less stringent alpha level of $p < .05$). Self-esteem category, however, prospectively predicted depressed mood at the stringent alpha level of .007; those with much lower than average self-esteem reported significantly higher levels of depressed mood than those with average and above average self-esteem. However, these findings also need to be interpreted in the context of gender differences, with self-esteem prospectively predicting depressed mood in girls only. These results indicate that although self-esteem may be an important protective variable for consideration in programs designed to prevent or reduce body image disturbance and depressed mood in children, the improvement of self-esteem in boys may not be associated with the desired decrease in these disturbances, with increases in self-esteem having no effect on depressed mood in the subpopulation.

An unexpected outcome of gender interaction analyses worthy of further investigation is the finding that self-esteem prospectively increased the risk of dietary restraint in girls. As discussed in Chapter 7, the positive relationship between self-esteem, self-efficacy, and internal locus of control may explain, in part, these results. Specifically, high self-esteem may be predictive of increased dietary restraint because high self-esteem is usually accompanied by a high degree of self-efficacy and an
internal locus of control (Judge et al., 1998; Judge et al., 2002), meaning that an individual may feel more capable of achieving success through dieting. Those with high self-esteem are therefore more likely to engage in this behaviour than those with low self-esteem who have little or no belief in their ability to successfully lose weight (Bandura, 1977).

Finally, results from moderation analyses revealed that, cross-sectionally, body surveillance was significantly associated with weight and shape concern at the low self-esteem level only, suggesting that high self-esteem may act as a protective factor for this particular pathway. Prospectively, weight and shape concern was significantly associated with dietary restraint at the low self-esteem level only (albeit at the less stringent \( p < .05 \) level). These findings indicate that self-esteem may be a potential target for prevention programs, discussed in greater detail in Section 9.4.

9.2.2.4.2. Conclusion. Collectively, results from Study 2d provide additional evidence in support of the suggestion that body image disturbance is associated not only with disordered eating (Study 2b) and depressed mood (Study 2c), but also with aspects of psychological well-being more broadly, specifically self-esteem. Findings also indicate that self-esteem may play a protective role within the objectification theory framework. These findings therefore support previous research that considered high self-esteem to be fundamental to mental health and a protective factor that promotes adaptive behaviours and cognitions through its role as a buffer against the impact of negative influences (Mann et al., 2004). Based on the evidence supporting the role of self-esteem as a protective factor in the development of body image disturbance and depressed mood, improving and fostering robust self-esteem may be useful in preventing or reducing body shame, weight and shape concern, and depressed mood. As discussed in Chapter 7, this may have further implications for the prevention of more serious psychopathology, particularly in girls.
9.2.2.5. Study 2 conclusion. Results from the four substudies that formed Study 2 serve to highlight the importance of the variables posited by objectification theory in the development of dietary restraint, depressed mood, and low self-esteem in children. Results also serve to highlight gender differences in the various posited pathways, an area that has not been consistently addressed in the past. These findings should be of importance to clinicians and researchers investigating potential childhood antecedents to eating disorders and depression, with results providing several specific variables that may be targeted in prevention programs: low self-esteem, weight and shape concern, and body shame (discussed in greater detail in Section 9.4).

9.2.3. Study 3: An investigation of young girls’ implicit attitudes towards objectified images. A thorough investigation of previous research on objectification in young girls revealed that this research had failed to answer several fundamental questions pertaining to the processing of objectified images. Specifically, do young girls assimilate the objectification depicted in the images to which they may be exposed? Are they able to distinguish between objectifying and non-objectifying images? How do they feel about these images? Accordingly, Study 3 took a different approach to Studies 1 and 2 by examining the processing of objectifying images. This study aimed to provide an in-depth understanding of how the concept of objectification is assimilated in young girls. Specifically, Study 3 sought to (a) quantitatively and qualitatively explore how young girls describe and respond to depictions of both objectified and non-objectified peers to ascertain whether they have assimilated objectification and (b) examine any meaning they attach to images depicting objectification.

9.2.3.1. Summary of results and implications. Results from Study 3 revealed that while participants commented predominantly on the perceived personality of the girls depicted in a non-objectified way, girls depicted in an objectified way were discussed primarily in relation to their appearance. This suggests that participants
readily objectified those girls depicted in an objectified way, evaluating them primarily based on this aspect. Objectified girls were also predominantly described as “cool,” “fashionable,” and “stylish,” suggesting that although participants may not have been consciously aware of objectification or were unable to verbalise or articulate objectification as perhaps adults would, their interpretations of objectified peers compared to non-objectified peers point to a degree of assimilation and processing of objectifying content.

Despite many participants commenting that the objectified girls were cool, fashionable, and attractive to the opposite sex, many also commented that the objectified girls were inappropriately dressed, although participants struggled to verbalise what it was about these girls that was inappropriate beyond the use of superficial, descriptive terms (reflecting, perhaps, their stage of cognitive development). Additionally, objectified girls were treated as a dissociative reference group (White & Dahl, 2006) with most participants reporting that they did not want to befriend them, nor did they want to look like them. Although they were in the same age group as participants in the study, perhaps the objectified girls were treated as a dissociative reference group because they were perceived as not only being significantly older than the non-objectified girls, but also older than the participants in the study, and therefore did not represent the participants’ equals.

Despite many participants reporting that they did not want to look like the objectified girls, they thought their friends would like to look like these girls, with the reasons given for their friends wanting to look like the objectified girls often being the same reasons they gave for not wanting to look like them. As discussed in Chapter 8, it could be that in asking about their friends’ opinions, participants felt they could “hide behind” these responses, unwittingly revealing their own desires and opinions and suggesting that desirability of an objectified “look” may be underestimated in children.
These results have several implications. First, children are avid consumers of the media (D. F. Roberts et al., 2005) and have increased access to the Internet, mobile phones, television, and other media sources. They are also spending large amounts of time engaging with media aimed at other (and older) age demographics (Department of Children Schools and Families, 2009; Harrison & Hefner, 2006; Social Issues Research Centre, 2008). Given the accessibility and proliferation of objectifying images, it is likely that children will be exposed to content that is intended for adults and may not be age appropriate. Indeed, the results of Study 3 suggest that young girls have already assimilated the objectification depicted in images to which they may be exposed, and are aware (at least subconsciously) of the differences between objectified and non-objectified peers.

Second, the mass media has an overwhelming influence on the lives of children and is becoming an increasingly important and powerful agent of socialisation, creating and reinforcing cultural values and providing pervasive modelling of gender roles and conduct (J. D. Brown et al., 2005; Bussey & Bandura, 1999). Given anecdotal evidence suggests that objectifying images of children are being increasingly used in the mass media (Carmody, 2010, March 21; Farr, 2011, May 6; Hunter, 2009, November 11; McKimmie, 2012; McPhee, 2010, March 18), and that children are exposed to the images seen in wider society, media depictions of objectification may encourage young girls to adopt objectified appearances and behaviours. As described in Chapter 2, the understanding of gender development and appropriate femininity and masculinity is not innate, but acquired through developmental processes whereby girls and boys draw information from the adults and peers, real and fictional, around them (Bussey & Bandura, 1999). The various social learning theories emphasise the importance of a child’s environment in his or her acquisition of information related to his or her gender. The assimilation of objectification found in Study 3 indicates that young girls acquire
information about objectification from the images to which they are exposed. Given the suggestion that individuals seek to behave in ways that are congruent with their gender by selecting same-sex models to imitate and model (Bussey & Bandura, 1999), the information acquired from the images has the potential to influence the development of gender schemas.

9.2.3.2. Conclusion. Study 3 appears to be the first study to use an innovative mixed-method design to examine the processing of objectified images in young girls. As discussed, results suggest that young girls, even those as young as 6 years of age, may have already assimilated objectification and developed some implicit attitudes towards objectifying content. However, this research was conducted in girls only and, as such, an examination of the processing of objectified images in young boys is needed. Nevertheless, in providing an in-depth understanding of how the concept of objectification is assimilated in young girls, this study represents important exploratory work that has implications for the development and implementation of media literacy programs designed to address objectification. Consistent with previous studies of this thesis, results suggest that the implementation of these programs in adolescence may be too late, a finding discussed in greater detail in Section 9.4.

9.3. Overall Strengths

There are several features of this thesis that may be considered novel. The first is the examination of self-objectification in a sample of young boys and girls. Although the theoretical background for how children could come to self-objectify has been posited in various reviews (American Psychological Association Task Force on the Sexualization of Girls, 2007; Papadopoulos, 2010), an account of the degree to which children actually do self-objectify was lacking in previous research. The results of Study 2a thus provided insight into whether young boys and girls self-objectify, and how this
self-objectification compares to the self-objectification experienced by older populations.

The second novel feature of this research is the cross-sectional and longitudinal examination of objectification theory as it pertains to the development of disordered eating, depressed mood, and low self-esteem in children. Few existing longitudinal studies have tracked individuals, especially boys, for longer than a year (Ricciardelli & McCabe, 2004). Studies 2b and 2c appear to be the first to directly examine the framework of objectification theory in children, with the explicit assessment of both self-objectification and body surveillance particularly noteworthy. Results from these studies therefore provide initial insight regarding the relative utility and validity of this theoretical framework in children.

Additional strengths of this thesis include the use of measures and statistical analyses that allowed the constructs and hypotheses under investigation to be appropriately assessed and examined. In particular, the evaluation of objectification theory using sophisticated statistical methodology (specifically, structural equation modelling), allowed the theoretical model of objectification theory to be tested directly and the associations between the different theoretical constructs to be estimated simultaneously and in the absence of measurement error.

Although only subclinical eating disorder symptoms were measured in this thesis, as noted in Chapter 2, there is strong evidence to suggest that body image disturbance plays a crucial role in the pathogenesis of more severe eating disorder symptoms and in the subsequent onset of full-syndrome eating disorders (Davison et al., 2003; Field et al., 2003; Jacobi et al., 2004; Neumark-Sztainer et al., 2006; Polivy & Herman, 2002; Wertheim et al., 2001). Subclinical symptoms are also an important component of psychological development in their own right, so the importance of investigating these symptoms should not be discounted. Furthermore, by studying a
sample of community-based children, an improved understanding of what factors might be predictive of the development of eating disorders was gained. Finally, the consideration of possible gender differences within the framework and the development of measures of self-objectification and objectified body consciousness in children (in recognition of the lack of available measures in this population) also constitute significant strengths and contribute to the utility of this thesis.

9.4. Implications

The results presented throughout this thesis have several implications for research and clinical practice in the area of body image disturbance and eating disorder symptomatology. Implications for prevention and clinical practice are discussed here.

9.4.1. Primary prevention. As noted in Chapter 2, children are exposed from early childhood to messages about physical appearance (Jung & Peterson, 2007; Myers & Crowther, 2007). They learn that appearance and beauty are especially important, and that weight is critical to body image, body esteem, self-concept, and self-esteem (Mendelson & White, 1982; Striegel-Moore et al., 1986). Through social learning mechanisms, the mass media has the power to construct how children perceive themselves, with the ideal body image held by children constructed from social and cultural factors (Jung & Peterson, 2007).

Given the widespread dissemination of images presenting an unrealistic body ideal for both males and females, minimising the importance of thinness and attractiveness is imperative. Specifically, diversifying the size and attractiveness of individuals presented in the media to more realistically represent the diversity of shapes and sizes is important in protecting males and females from ideal images (Clay et al., 2005) and for reducing the pressure many may feel to make their bodies conform to a sociocultural ideal. However, despite evidence to the contrary (e.g., Halliwell & Dittmar, 2004), the belief that thinness and attractiveness sell whereas fatness does not
(Halliwell & Dittmar, 2004) is unlikely to change; the expectation to be sexy, thin, and beautiful will remain. Prevention efforts are therefore hindered by the wider sociocultural factors associated with eating disorders, specifically the impossibility of altering the sociocultural context that promotes unrealistic ideals (Huon, Braganza, Brown, Ritchie, & Roncolato, 1998). Indeed, given the prevalence of ideal images in the mass media and the glorification of thinness in Western society, it seems unrealistic to assume that such an entrenched practice will change in the short- to medium-term. As such, although there is a need to develop approaches that challenge this broader environment (such as the implementation of regulatory codes not unlike those proposed in Australia by the National Advisory Group on Body Image, 2009), other, more achievable, approaches are needed to sufficiently defend boys and girls against the sociocultural attitudes that promulgate the idea that attractiveness is of primary importance (Tiggemann, 2013).

Media literacy programs are a promising prevention approach designed to decrease internalisation of media ideals, ameliorate the negative effects of exposure to idealised images, and ultimately prevent the development of eating disorders (Wilksch, Tiggemann, & Wade, 2006). Media literacy programs aim to empower individuals to oppose the effects of the media by encouraging them to recognise, critically analyse, and challenge media content and the intention of media messages, and acknowledge that media images and messages are constructions rather than reflections of reality (Choma, Foster, & Radford, 2007; Groesz et al., 2002). In the context of eating disorder symptoms, media literacy programs can be used to critique appearance ideals and increase awareness of the discrepancy between the artificial and constructed idea of beauty in the media and the diversity of weight and shapes in society (Groesz et al., 2002). This awareness may, in turn, reduce the value placed on thinness and appearance, reduce internalisation of societal attitudes towards appearance, reduce
perceived pressure to be thin, and encourage a more realistic body ideal. It is thought that by equipping children with the skills to help them think critically about the images and messages they encounter, and by detailing the various methods used to engender feelings of body shame, they become more aware that the ideal is unattainable and unhealthy, and more resistant (and therefore less vulnerable) to these messages (Sinclair, 2006; Tiggemann, 2002).

Media literacy programs are particularly suited to children because compared to adults, children are intrinsically less critical and more passive consumers of the media (Social Issues Research Centre, 2008). They lack the cognitive skills, knowledge, and abilities of adults to comprehend the nature and purpose of commercial messages (Kunkel et al., 2004), and as such they are limited in their ability to scrutinise what they see and lack the ability to assimilate information from advertisers and the media in a critical way. Children who are taught to use the media more critically have been found to be less susceptible to the negative effects of subsequent media use (Austin & Johnson, 1997). For eating pathology specifically, increased knowledge and resistance skills in children and adolescents have been found to improve body image, and reduce eating disorder symptomatology, the glorification of thinness, and the tendency to engage in social comparison (Elliot et al., 2006; Levine & Murnen, 2009; McVey, Davis, Tweed, & Shaw, 2004; Steiner-Adair et al., 2002; Stewart, Carter, Drinkwater, Hainsworth, & Fairburn, 2001), suggesting that children may indeed be able to develop skills that protect them from sociocultural messages about appearance (Smolak, 2008). Although it is possible that raising awareness of body image issues may make participants of these programs more concerned about their weight and shape, there is no reliable evidence supporting this view (Paxton, 2002).

Whilst messages considered worthy of deconstruction have included those that promote the thin ideal, and the use of dieting as a means to achieve this ideal (McCabe
& Ricciardelli, 2005; Sinclair, 2006; Stice & Shaw, 1994), the increasing pressure on males (and boys) to achieve a muscular ideal means that messages promoting muscul arity are also worthy of examination. This thesis also highlights the importance of helping children adopt strategies to cope with objectifying messages and the negative psychological consequences these messages may predict. According to Fredrickson and Roberts (1997), making individuals, and girls and women in particular, more aware of the adverse psychological consequences of objectification may help them resist these messages and prevent them from internalising an outside observer’s perspective of their physical selves. For children, this may mean integrating lessons into the school curriculum that encourage boys and girls to critically evaluate objectifying images (Fredrickson & Roberts, 1997), whilst also providing information to parents and caregivers (Tiggemann, 2013). Calogero et al. (2005) noted the increasing need to tackle objectification in media literacy programs aimed at children, arguing that it is imperative individuals learn about the negative consequences of self-objectification early in their physical, social, and emotional development. Tiggemann (2013) more recently argued that increasing awareness of the concepts of sexual objectification and self-objectification, and the deconstruction and critical analysis of objectifying images, would make useful additions to media literacy programs.

Although media literacy programs are typically implemented in adolescence (Dittmar et al., 2006), recent evidence suggests they may have limited efficacy in reducing the behaviours associated with eating disorders (Victorian Centre of Excellence in Eating Disorders and the Eating Disorders Foundation of Victoria, 2004). Several researchers have argued that this is because they are being implemented too late, when beliefs about the media and the body are already entrenched and resistant to change (Dittmar et al., 2006; Levine & Smolak, 2009; Smolak & Levine, 1994). By adolescence, negative attitudes towards the body appear to be strongly ingrained
(Smolak & Levine, 1994). Smolak and Levine (1994) reasoned that because thinness schemas (cognitive structures integrating the thin-ideal, body dissatisfaction, and weight control techniques; Smolak, 2004) are gradually constructed during childhood, children will not have fully integrated these beliefs and attitudes about the cultural ideal, and the importance of attaining the ideal, into their self-schemas. As such, beliefs about the importance of thinness and its attainability through weight-loss behaviours are yet to be crystallised. Children are therefore likely to be less resistant to the messages in prevention programs meaning prevention programs have a greater chance of being effective (Smolak & Levine, 2001). More recently, Hargreaves and Tiggemann (2002) observed that appearance schemas are relatively stable by mid-adolescence, suggesting that early intervention is warranted. This thesis supports these arguments, with results from the collection of studies conducted for this thesis suggesting that media literacy programs need to target much younger children, and may be more effective if implemented in early- to middle-childhood. This was the developmental period in the series of studies conducted for this thesis where the influence of body image disturbance on disordered eating and self-esteem appeared to increase.

Although media literacy programs are promising interventions, encouraging individuals to resist the various influences of media images when they are so pervasive is difficult (Sanders, Gwynne, & Gaskill, 2000). It has also been suggested that media literacy programs may not have demonstrably immediate effects on individual body image disturbance or disordered eating because they may not tap the emotional processes that mediate the relationship between media use and eating disorder symptoms (Vaughan & Fouts, 2003). As such, other programs that focus on general prevention, and that not only modify critical risk factors but also intervene in the specific mechanisms by which these risk factors lead to a given disorder, are necessary. Indeed, comprehensive prevention programs that include the components of media
literacy programs and that focus also on: (a) risk and protective factors; (b) improving participants’ understanding of the influence of genes on body shape; (c) increasing the acceptance of diversity in weight and body shape; (d) increasing awareness of the developmental changes expected with puberty and the counterproductive and dangerous effects of dieting; and (e) increasing the value of physical activity, self-acceptance, and self-esteem, are likely to be most effective in the prevention of eating disorder symptoms (Kater, Rohwer, & Londre, 2002).

The results of this thesis have implications for the implementation of these more general prevention programs as well. First, the moderator identified in this thesis, self-esteem, offers a target for intervention in the treatment of children who engage in body surveillance. As self-esteem is an individual difference variable, it is more likely to be amenable to change and may therefore provide a useful target for fostering healthy body image in both boys and girls (although results of Study 2d suggest it is more likely be beneficial in girls). Indeed, prevention programs directed towards increasing self-esteem and media literacy have had some success in reducing weight concerns (e.g., Wade, Davidson, & O’Dea, 2003).

Second, given this thesis found that body shame and body dissatisfaction prospectively predicted the development of dietary restraint, programs that target body shame and body dissatisfaction might not only reduce these disturbances, but may also prevent the development of dietary restraint. According to Tiggemann (2013), an advantage of formulating a treatment or prevention plan that focuses on theorised common precursors to depression and eating disorders, such as self-objectification and body shame, is that these more serious psychopathologies, and other subclinical yet serious disturbances, can be tackled simultaneously.

Third, given body surveillance prospectively predicted body dissatisfaction, which, in turn, prospectively predicted dietary restraint, the targeting of body
surveillance which occurs earlier in the putative mediation chain may be one fruitful and necessary avenue for prevention programs, a sentiment that echoes Tylka (2004) and Fitzsimmons-Craft (2011). Specifically, programs that aim to reduce appearance-based comparisons with media images and with other people, and that build awareness of self-monitoring behaviours, may reduce negative body image (Tiggemann & McGill, 2004).

Overall, results of this thesis suggest that prevention programs may be strengthened by the inclusion of a module that aims to decrease self-objectification, body surveillance, body shame, and weight and shape concern. The importance of addressing body image disturbance in boys is also highlighted in this thesis, and, as such, it is essential that programs target gender-relevant issues rather than simply focusing on the issues most important to girls (McCabe & Ricciardelli, 2005). As with media literacy programs, for more general prevention programs to be successful they need to implemented in childhood, before the processes highlighted in this thesis become ingrained and resistant to modification and before body dissatisfaction and appearance schemas become entrenched and crucial to self-evaluation (Skemp-Arlt, 2006; Tiggemann, 2002). By the time children reach adolescence, they may already be experiencing significant levels of body image disturbance and engaging in body change strategies that are detrimental to their physical and psychological health. Arming young children with the tools they need to maintain healthy self-esteem and body esteem is therefore crucial (Skemp-Arlt, 2006).

It is worth noting here the difficulties associated with countering the widespread dissemination of the anti-obesity message promoted by the media. In today’s Western society there is conflict between current environmental factors that increase risk for obesity, such as sedentary lifestyles and the preponderance of fast food, and the message that being overweight is undesirable (Franko & George, 2009). In light of
recent increases in childhood overweight and obesity (Booth, Dobbins, Okely, Denney-Wilson, & Hardy, 2007), and the noted increase in the degree of overlap between obesity and disordered eating (Darby et al., 2009), this conflict presents a significant issue for children of today. Health promotion campaigns and the increasing awareness in schools of the undesirability of overweight and obesity may inadvertently increase weight and shape concerns and weight control practices (Burns & Gavey, 2004). The development of guidelines that balance the consequences of this type of education with the likely benefits of weight reduction during childhood is necessary to promote the maintenance of a healthy weight without overemphasising the importance of weight or stigmatising overweight children, who were found by Study 2a to be a particularly at-risk subgroup for body image disturbance. As suggested by Levine and Smolak (2002), a suitable compromise may be the implementation of programs that arm children with knowledge about exercise and nutrition, that focus on nutrition for strength, concentration, and physical activity, and that promote physical activity as a means of having fun and improving fitness.

9.4.2. Intervention. Although the majority of children who experience body image disturbance and eating disorder symptomatology experience these at a subclinical level, a significant minority will experience these symptoms at a clinical level. Although prevention programs are key in preventing the progression of body image disturbance or eating disturbance to a clinical eating disorder, for those who do experience these symptoms clinically or are already engaging in weight-loss practices, early intervention efforts that incorporate specific strategies for addressing these behaviours may be more appropriate. Given the many influencing factors of eating disorders, a multidisciplinary approach is likely to be the most effective as it reflects the complexity and diversity of disordered eating development. Several therapeutic interventions specific to self-objectification have also been posited. For example, Moradi and Huang (2008), and
more recently Tiggemann (2013), suggest that a reduction in body surveillance may occur through the promotion of activities that encourage individuals to be more attuned to how their bodies feel as opposed to how their bodies look. Suggested activities include yoga, pilates, and tai chi, all movement-based activities that emphasise the physical capabilities of the body and encourage a first-person as opposed to third-person view of the self (Sinclair, 2006). Making individuals aware of their body surveillance, and assessing and challenging the motives that drive this behaviour, may also be worth addressing in therapy (Fitzsimmons-Craft, 2011).

Calogero et al. (2005, p. 48) take a stronger position on the integration of therapeutic techniques that target self-objectification in those with eating disturbances. They argue that progress made in any area that is the focus of treatment is likely to be “undermined if socially constructed self-perceptions are not also targeted for change,” that is, if individuals continue to view themselves from a third person, rather than a first person, perspective. They therefore advocate for a thorough assessment of self-objectification, arguing that most who enter treatment are unlikely to identify self-objectification as a concern because they are socialised to experience self-objectification, body surveillance, and the constant improvement of physical appearance as natural. As a result, self-objectification may not be experienced as egodystonic.

9.5. Limitations

There are five main limitations to this thesis. First, age and developmental effects were not examined in any of the studies conducted. Modelling age effects would have required a much larger sample. Additionally, adequate consideration of developmental differences would have required participants be followed over a longer period of time. Given research by McKinley (2006) has suggested that age-related transitions are important to body experience, a consideration of developmental differences in the effects of self-objectification and body surveillance may be a key area
of future research. It is therefore recommended that future research be conducted using prospective designs with a more extended age range of participants, or spanning a longer time period, to follow young children through to late adolescence and capture crucial periods of development, such as the transition to adolescence. Some of the identified risk factors may have greater predictive utility in different developmental stages, and a longer follow-up would allow researchers to assess these differences, as well as aiding in the refining and tailoring of objectification theory to specific developmental periods. This has the potential to result in an improved understanding of how children at different developmental stages internalise an outside observer’s perspective of their physical selves.

A second limitation of this thesis is the suboptimal exploration of gender differences. Although gender effects were considered in Study 1 and Study 2, the inadequate sample size of these studies precluded the use of multiple-group analysis to examine gender differences in overall model fit. As such, whether the models tested in Study 2b and 2c are useful when examined in boys and girls separately cannot be determined, making future research on gender differences in the objectification theory framework important. Additionally, tests of measurement invariance were not conducted prior to comparing boys and girls on the variables under investigation because the sample size of the studies comprising this thesis precluded such an examination. The ability to make meaningful comparisons between boys and girls, however, requires that the same construct be measured across groups (MacCallum & Austin, 2000). It is therefore important that the degree of measurement invariance be formally investigated before firm conclusions about gender differences and the relationships between constructs are made.

A third limitation is that this thesis did not examine muscularity concerns, which are increasingly being recognised as an important component of both male and female
body image (Jones & Crawford, 2005; Ricciardelli & McCabe, 2001a). Although the age of the sample under investigation may have limited any findings in relation to muscularity, the role of self-objectification in the development of muscularity concerns or the desire to be more muscular is highly plausible and must be examined. Male body image disturbance more generally also demands increased attention as there is currently a paucity of theoretical and empirical work that has addressed the development of body image disturbance and eating disorder symptomatology in this population. This has perhaps resulted in an underestimation of the extent to which body image issues affect males.

Before the examination of muscularity can occur, however, it is necessary to develop assessment tools that are relevant to both male and female body image. For example, current figure rating scales used in the assessment of body dissatisfaction do not distinguish between increased size due to muscularity and increased size due to fat (Cohane & Pope, 2001). The creation of a measure that allows males and females to select their ideal body based on both muscularity and adiposity is needed if an accurate understanding of body dissatisfaction is to emerge. An exploration of more specific aspects of body dissatisfaction (such as dissatisfaction with weight, height, shoulder width, or thighs) as opposed to body dissatisfaction more generally, may also be valuable.

A fourth limitation concerns the measure used to assess self-objectification across the studies of this thesis (and in previous investigations of self-objectification and objectification theory). Although self-objectification is defined as occurring when individuals internalise a critical observer’s perspective of their physical selves (Fredrickson & Roberts, 1997), the SOQ only assesses the extent to which individuals value appearance-based body attributes over competence-based body attributes. This measure does not explicitly ask participants if they are assuming an observer’s
perspective of their body. Therefore, the extent to which the SOQ effectively assesses self-objectification as defined by Fredrickson and Roberts (1997) can be called into question. Although, as described in Chapter 3 (Section 3.2), this measure of self-objectification is widely used in objectification theory research, given the aforementioned limitation, researchers should exercise caution when interpreting scores on this measure. Future efforts should be directed towards creating a more accurate measure of self-objectification.

Finally, as described in Chapter 5 (Section 5.5.1), although the longitudinal design of this thesis allowed for the establishment of temporal precedence and therefore permitted greater confidence in the direction of effects between variables, the lack of experimental manipulation limits the confidence that can be placed in causal inferences. Future studies should, ideally, endeavour to implement randomised prevention interventions aimed at decreasing self-objectification and habitual body monitoring in children to examine the effect that reducing these putative risk factors has on outcomes, and triangulate the results from prospective studies. This manipulation of the variables of objectification theory offers a powerful way of experimentally investigating the hypothesised relations among the variables, results of which can then be used to definitively establish the consequences of self-objectification.

Another limitation, mentioned in earlier chapters, is the fairly homogenous samples that comprised predominantly Caucasian participants, which limit the generalisability of the thesis. Indeed much of what is known about body dissatisfaction is based largely on White women. Further study among diverse ethnic groups and among males is needed. It is also necessary to note that fit statistics for the cross-lagged tests of the models under investigation were not excellent. Ongoing evaluation and revision of these models may allow for further improvement in the validity of objectification theory.
In addition to studies that address these limitations and serve to extend the findings obtained here, there are several other avenues for future research. These are now highlighted.

9.6. Future Directions

As described in Chapter 2, the causes of eating disorders and eating disorder symptoms are complex and multifactorial. No single etiological variable can fully explain the emergence of eating disorders, and many more variables have been proposed as putative risk factors than those examined by this thesis. As such, there are likely to be other influences that are relevant to children’s body image. A thorough and methodologically rigorous examination of the relative contributions of these putative risk factors is needed to allow the relationships between the different predictor variables and eating disorders symptoms to be more clearly delineated, thereby informing prevention programs and potentially improving their effectiveness. For instance, as the school and family are proximal to a child’s life (Jessor, 1993), their influence is likely to be direct and just as important as the influence of the media in leading to a schematic set of beliefs about the importance of appearance. Indeed, the family is the most integral socialisation agent in a child’s life (Davison, Markey, & Birch, 2000). Belief systems and attitudes operating within the family are therefore likely to be highly influential in the development of body image. As children approach adolescence, however, peers may become more important in the transmission of social messages, specifically objectification (Sands & Wardle, 2003), and engagement with idealised images and messages may be reinforced by the value placed on appearance by peers (Clark & Tiggemann, 2006).

However, although many studies have examined the internalisation of media ideals, few have explored peer relationships and fewer still have examined media, familial, and peer influences simultaneously. Studies examining the concurrent
influence of peers, family, and the media are therefore necessary when constructing comprehensive etiological models of body image disturbance and eating disorder symptomatology. The assessment of objectification within the family and the possible impact of parental self-objectification on children may be one possible avenue for exploration.

Another avenue for future research is that of the role of self-objectification in the development of appearance schemas and, conversely, the influence of appearance schemas on self-objectification. Appearance schemas are cognitive structures that guide the processing of information related to the self and appearance (Cash & Labarge, 1996; Markus, 1977; Sinton & Birch, 2006). They contain information regarding the importance and meaning of appearance in an individual’s life and, according to Cash, Melnyk, and Hrabosky (2004), are a core component of body image investment and central to the understanding of body image experiences in everyday life. From a cognitive-behavioural perspective, contextual events activate schema-based processing of information about appearance (Cash, 2002). It is possible that the contextual experience of being objectified, or any appearance-related cues for that matter, may influence an individual’s appearance schema and change how they feel about their body (Clark & Tiggemann, 2007; Hargreaves & Tiggemann, 2003). It is equally plausible that appearance schemas themselves influence whether an individual is negatively affected by sociocultural influences, particularly if they guide the processing of information related to the self. Appearance schemas may, for instance, influence body dissatisfaction by increasing the incorporation and awareness of appearance-related information, or by creating a bias whereby individuals selectively attend to the appearance-related aspects of presented material (Sinton & Birch, 2006; Tiggemann, 2002). The role of appearance schemas within the objectification theory framework therefore warrants further investigation.
Whilst this thesis focused on the consequences of self-objectification, an examination of the antecedents of self-objectification would also be of interest. As stated in Chapter 2, self-objectification is an individual difference variable meaning that vulnerability to self-objectification differs between individuals. Exactly what factors make an individual more likely to self-objectify remain unclear and future research exploring these factors will be beneficial to prevention programs. Furthermore, in children, knowledge about objectification may be higher than self-objectification. That is, developmentally, many may not have internalised an outside observer’s perspective of their bodies but they may be aware that objectification exists. Given the negative psychological consequences of self-objectification, the creation of a measurement tool that assesses awareness of objectification may help in the a priori identification of children that may be particularly at risk for self-objectification.

Future research should also consider modelling self-objectification and its negative psychological consequences as a vicious cycle. In Studies 2b and 2c, modification indices recommended the implementation of several feedback loops within the models under investigation. These feedback loops are theoretically plausible and warrant further attention. Finally, as noted in Chapter 7, research has tended to focus on the risk factors for negative body image. A greater focus and understanding of the factors that lead to positive body image or that protect individuals from self-objectification and habitual body monitoring will be useful to the understanding of eating disorders and for the development of prevention and intervention programs. Given the prevalence of body image disturbance and eating disorder symptomatology in children, and the known physical and psychological implications of these disturbances at these young ages, this thesis highlights the need to direct more research attention to children generally.
9.7. Conclusion

This thesis aimed to investigate the hypothesised contribution and etiological significance of self-objectification in the development of body image disturbance and eating disorder symptoms in children. Through three broad studies, it has contributed to the existing research on objectification theory by providing direct support for the validity of this framework in children. It has also provided evidence that the negative psychological consequences of self-objectification posited by objectification theory prospectively predict dietary restraint, with this process beginning in middle childhood. This thesis has also added to the growing body of evidence that body image disturbance and eating disorder symptomatology are present in children. On a positive note, this thesis provided evidence for the protective role of self-esteem, suggesting that the consequences of self-objectification, and body image disturbance more generally, may be prevented.
Chapter 10. References


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Appendix A

Publications Arising From This Thesis


Abstract

Eating and body image disturbances in children are typically assessed using the Children’s Eating Disorder Examination (ChEDE); however, support for the reliability and validity of scores on this measure is mixed. Furthermore, previous studies suggest that scores obtained from a simplified 8-item version of the ChEDE may be more reliable and useful for research purposes than scores obtained from the full scale. The present study sought to psychometrically evaluate the reliability and factor structure of this brief 8-item scale. Two separate community-based samples of 6- to 11-year-olds (N = 535) were administered the ChEDE as part of a broader assessment battery. The brief 8-item model provided a good fit to the data, as determined by confirmatory factor analysis. Additionally, scores obtained from the 8-item scale, as well as a global ChEDE score, provided reliable measures of a child’s eating disorder symptoms, and were superior to the original 4 subscales in both healthy-weight and overweight/obese samples. The brief 8-item scale may therefore be used by researchers who want a reliable and valid index of global eating disorder psychopathology without doing a full interview.

Keywords: Eating Disorder Examination, children, reliability
Recent studies have reported significant body image disturbance and eating disorder symptomatology in children ages 5 to 13 years, including food avoidance, preoccupation with weight and shape, fear of weight gain, and self-induced vomiting (Madden, Morris, Zurynski, Kohn, & Elliot, 2009; Pinhas, Morris, Crosby, & Katzman, 2011). The Children’s Eating Disorder Examination (ChEDE; Bryant-Waugh, Cooper, Taylor, & Lask, 1996) is a comprehensive, semistructured clinical interview designed to assess the full range of eating disorder symptomatology, behaviours, and attitudes in young children. Adapted from the Eating Disorder Examination (the widely used “gold-standard” assessment measure for eating disorders in adults; Fairburn & Cooper, 1993) the child version has been modified by Bryant-Waugh et al. (1996) to assess the intent associated with disordered eating behaviours as well as the behaviour itself. Modifications included the simplification of language for use in children, the use of a practical sorting task to assess overevaluation of weight and shape, and more detailed explanation at the beginning of the interview of the time frame to which the questions refer. The original four-subscale structure of Restraint, Eating Concern, Shape Concern, and Weight Concern is retained in the ChEDE, along with diagnostic items that can be used to arrive at a clinical diagnosis of an eating disorder.

Support for the reliability and validity of ChEDE scores has been mixed. In an evaluation by Watkins, Frampton, Lask, and Bryant-Waugh (2005) of 60 children ages 8 to 14 years from a specialist outpatient eating disorder clinic, reliability was good to excellent with internal consistencies of .80, .91, .90, and .88 for the Restraint, Eating Concern, Weight Concern, and Shape Concern subscale scores respectively. In addition, scale scores were found to discriminate well between individuals with an eating disorder and those without, as well as between those with anorexia nervosa and “other” eating
disturbances, such as selective eating or food avoidance emotional disorder, supporting the sensitive known groups validity of scores on this measure. By contrast, a study by Decaluwé and Braet (2004) using an English-to-Dutch translated version of the ChEDE on 139 treatment-seeking obese children ages 10 to 16 years observed poor internal consistency coefficients for the three subscales of Restraint (.53), Eating Concern (.59), and Weight Concern (.62) but good reliability for Shape Concern (.84).

Using a much larger community-based sample of 699 Australian girls ages 12 to 15, Wade, Byrne, and Bryant-Waugh (2008) found internal reliabilities of .68 for Restraint, .63 for Eating Concern, .79 for Weight Concern, .88 for Shape Concern, and .93 for the Global scale. In an exploratory factor analysis, Wade et al. (2008) observed that a much simpler one-factor model consisting of eight items loading predominantly on the Weight Concern and Shape Concern subscales was more stable than the original four-factor model and had excellent internal reliability at .91. In a replication of this finding on the EDE in 158 eating disordered, 170 treatment-seeking obese, and 329 non-eating disordered community-based adult females by S. M. Byrne, Allen, Lampard, Dove, and Fursland (2010), the one-factor, eight-item model proposed by Wade et al. (2008) fit the data more satisfactorily than other proposed factor models. Furthermore, the reliability of scores obtained from the eight-item scale, as well as scores obtained from the ChEDE Global scale, was superior to the reliability of scores on the other subscales in both community-based and overweight/obese samples, with internal consistencies of .88 and .86 for the eight-item scale and Global scale in the community-based sample, and internal consistencies of .82 and .86 for the eight-item scale and Global scale in the overweight/obese sample.

Although these findings support the utility of the brief eight-item scale, the S. M. Byrne et al. (2010) study was conducted on the EDE and their sample consisted of adults. An examination of the utility (i.e., reliability and validity) of scores on the brief
eight-item scale in children using the ChEDE does not appear to have been conducted. An examination of the eight-item scale in children would be useful, particularly for those in research-based settings who would like a measure of eating disorder attitudes but must also attend to child participants who become easily fatigued and distracted during long assessments (Ricciardelli & McCabe, 2001).

Accordingly, to extend previous research in this area, the present study sought to psychometrically evaluate the fit, reliability, and construct validity of a brief eight-item model of the ChEDE in two community-based samples of boys and girls. If the reliability results observed in previous studies can be replicated in a younger sample using the ChEDE, this would be of benefit to researchers who want a reliable and valid index of global eating disorder psychopathology without having to conduct the time-intensive full interview. As little attention has been paid to the comparability of the ChEDE between boys and girls, the present study also sought to investigate gender differences in the reliability of ChEDE scores as well as the comparability of the one-factor eight-item model. Finally, to examine the stability of the one-factor eight-item model across developmental phase, factorial invariance across age groups was also investigated.

Method

Participants

Sample 1. Following ethical approval from the University’s Human Research Ethics Committee and the respective ethics committees for private and state schools in Western Australia, 253 children (109 boys and 144 girls) were recruited from nine metropolitan primary schools in Perth, Western Australia. The schools were drawn from a broad geographical area and represented a range of socioeconomic classifications. After approval from school principals was granted, a letter of introduction describing
the purpose and procedures of the study was sent to the parents of all children in Grades 1 to 5, inviting their children into the study and requesting parental approval. Assent forms for children were attached to this invitation. Children who received parental consent and provided assent forms were recruited into the study. The consent rate from this process was approximately 10%. Participants ranged in age from 6 to 11 years, with a mean age of 8.30 years ($SD = 1.45$). Of these children, 85% were healthy-weight, 13% were overweight, and 2% were obese.

**Sample 2.** Children from the second sample were participants of the Growth and Development (GAD) Study, a population-based cohort study being conducted in Western Australia that has a central focus on the development and persistence of childhood obesity, and a secondary focus on eating disorder symptoms and psychological difficulties in healthy-weight and overweight and obese children. Therefore overweight and obese children were recruited as well as a healthy-weight sample matched for age and gender. Children were recruited from 10 metropolitan primary schools in Perth, Western Australia. The schools were drawn from a broad geographical area and represented a range of socioeconomic classifications. Ethical approval for this research was obtained from the necessary ethics committees. For further information regarding recruitment procedures for the GAD Study, please refer to Gibson et al. (2007).

Children were between the ages of 6 and 13 years at the time of recruitment, however only baseline data from children who were between the ages of 8 and 11 in the first wave of data collection were used in the present study. In total, data from 288 participants (125 boys and 163 girls) were used. Participants had a mean age of 9.04 years ($SD = 1.13$). Of these children, 51% were healthy-weight, 30% were overweight, and 19% were obese.
Sample 1 and Sample 2 did not differ with respect to gender, both having slightly more girls than boys. Sample 2 was, however, significantly older than Sample 1, $t(466.03) = 6.41, p < .001$, Cohen’s $d = 0.56$. As expected, the samples also differed significantly in terms of weight classification, with Sample 2 having significantly more overweight, $\chi^2(1) = 21.16, p < .001$, and obese, $\chi^2(1) = 37.21, p < .001$, participants compared to Sample 1.

Measures

The following description of measures for weight and height and the ChEDE applies to both samples. The description of measures for the Children’s Body Image Scale (CBIS) and Modified Objectified Body Consciousness Scale for Youth (OBC-Y) applies only to Sample 1.

**Weight and height.** Children were weighed (to the nearest 0.01kg) and measured (to the nearest millimetre) in light clothing and without shoes with a regularly calibrated set of Tanita Digital Medical Scales and a regularly calibrated portable Harpenden stadiometer. Body mass index (BMI), a valid reflection of adiposity (Garrow & Webster, 1985), was calculated from height and weight using the formula $\text{kg/m}^2$. Weight status was defined using the Cole, Bellizzi, Flegal, and Dietz (2000) international age- and gender-specific BMI cut-offs for categorising children as healthy-weight, overweight, or obese.

**Children’s Eating Disorder Examination.** The ChEDE, as described in the introduction, is a comprehensive, semistructured clinical interview designed to assess the full range of eating disorder symptomatology, behaviours, and attitudes in young children. Individual items are averaged to generate four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. Subscale items are rated on a 7-point, forced-choice scale ranging from 0 (*no restraint/concern*) to 6 (*restraint present*)
everyday/extreme concern); thus higher scores indicate greater severity or frequency.

Additional questions assess the diagnostic features of eating disorders such as self-induced vomiting, excessive exercise, and binge-eating. Scores for these items reflect the number of episodes of the behavior in question reported over the preceding 4 weeks.

As described in the introduction, in addition to the traditional scoring system of the ChEDE, the present study evaluated the ChEDE Global scale as well as a brief eight-item scale. The items used in the calculation of each of the scoring methods are presented in Table 1. Scores on the Global scale are calculated by summing the four subscales and then averaging. Scores on the eight-item scale are calculated by summing the eight-items presented in Table 1 and then averaging.
### Table 1

*Items Used in the Calculation of Each of the Examined ChEDE Scoring Methods*

<table>
<thead>
<tr>
<th>Scoring method</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Four subscale</strong></td>
<td></td>
</tr>
<tr>
<td>Restraint</td>
<td>(102 Restraint over eating + 103 Avoidance of eating + 104 Empty stomach + 105 Food avoidance + 106 Dietary rules)/5</td>
</tr>
<tr>
<td>Eating Concern</td>
<td>(107 Preoccupation with food + 108 Fear of losing control + 118 Social eating + 119 Eating in secret + 120 Guilt about eating)/5</td>
</tr>
<tr>
<td>Weight Concern</td>
<td>(135 Dissatisfaction with weight + 136 Strong desire to lose weight + 137 Reactions to prescribed weighing + 139 Preoccupation with shape/weight + 141 Importance of weight)/5</td>
</tr>
<tr>
<td>Shape Concern</td>
<td>(138 Dissatisfaction with shape + 139 Preoccupation with shape/weight + 140 Importance of shape + 142 Fear of weight gain + 143 Discomfort seeing body + 144 Avoidance of exposure + 145 Feeling of fatness + 146 Flat stomach)/8</td>
</tr>
<tr>
<td><strong>Global score</strong></td>
<td>(Restraint + Eating Concern + Weight Concern + Shape Concern) / 4</td>
</tr>
<tr>
<td><strong>Brief eight-item</strong></td>
<td>(135 Dissatisfaction with weight + 137 Reaction to prescribed weighing + 138 Dissatisfaction with shape + 140 Importance of shape + 141 Importance of weight + 143 Discomfort seeing body + 144 Avoidance of exposure + 145 Feelings of fatness)/8</td>
</tr>
</tbody>
</table>

*Note.* ChEDE = Children’s Eating Disorder Examination (Bryant-Waugh et al., 1996).  

**Children’s Body Image Scale.** Body dissatisfaction was measured using the Children’s Body Image Scale (CBIS; Truby & Paxton, 2002), which calculates the discrepancy between respondents’ perceived body size and their ideal body size. This discrepancy is considered one of the best measures of body dissatisfaction in children (Gardner, Friedman, & Jackson, 1999). The CBIS was developed using photographs of Australian children of varying BMI and consists of seven figures ranging from the 3rd to the 97th BMI percentile for 10-year-old children. Separate scales are provided for boys and girls, and each individual figure corresponds to a specific BMI range. Children were
asked to select the figures that best represent their perceived and ideal body shapes.

Body dissatisfaction was calculated as the difference between perceived and ideal figure ratings with possible dissatisfaction scores ranging from -6 to +6. A score of zero indicates body satisfaction, a negative score indicates body dissatisfaction in the direction of desiring a larger figure, and a positive score indicates body dissatisfaction in the direction of desiring a thinner figure.

**Modified Objectified Body Consciousness Scale for Youth.** Body shame was measured using the five-item Body Shame subscale of a modified version of the Objectified Body Consciousness Scale for Youth (OBC-Y; Lindberg, Hyde, & McKinley, 2006). The OBC-Y is a 14-item measure designed to assess the degree to which adolescent youth view themselves as objects to be looked at and evaluated by others. The Body Shame subscale examines how ashamed individuals are of their body when it does not conform to cultural standards (e.g., *When I’m not the size I think I should be, I feel ashamed*). Participants indicated their agreement to each of the five items by responding on a 4-point scale of 2 (yes), 1 (sometimes), 0 (no) or not sure (rated as missing). The not sure response was included as an option as suggested by Huon, Godden, and Brown (1997). Total scores ranged from 0 to 10, with higher scores indicative of greater body shame.

**Procedure**

Participants from both samples were individually and privately assessed by interviewers thoroughly trained by a ChEDE certified trainer to ensure standardized administration and scoring of the interview. Participants were first weighed and measured by the interviewers, positioned on the stadiometer so that their heels and buttocks were against the vertical support of the stadiometer and their head facing forward. Children in Sample 1 were then administered the ChEDE, CBIS, and OBC-Y as part of a broader battery of verbally administered measures. Children in Sample 2
were administered the ChEDE as part of a broader battery of verbally administered measures. Each interview took approximately 30 – 60 min. Interviews were conducted by doctors, psychologists, and fourth year or higher psychology students. Ongoing supervision was provided to all involved in the assessments by a certified ChEDE trainer to ensure assessment fidelity. This supervision involved scheduled meetings to discuss any difficulties associated with the administration of the ChEDE. Peer supervision was also used to ensure assessment fidelity. This involved the observation of several ChEDE administrations and was followed by a review of the assessment process and scoring. Last, all ChEDE scores obtained with Sample 1 were checked and entered by the first author (MJ), and all ChEDE scores obtained with Sample 2 were checked and entered by the fourth author (KA). If any scoring decisions required clarification, scores were checked with the interviewer prior to data entry.

**Statistical Analysis**

The psychometric properties of the ChEDE were evaluated through confirmatory factor analysis (CFA), inspection of Cronbach’s alpha, and inspection of correlations between the ChEDE, CBIS, and OBC-Y. The CFA was conducted in Mplus 6.0 (Muthén & Muthén, 1998–2011) and Cronbach’s alpha coefficients and correlations were generated in SPSS. The following criteria were utilized in the classification of internal consistency coefficients: Values ≥ .90 were considered excellent, values ≥ .80 were considered good, values ≥ .70 were considered adequate, values ≥ .60 were considered questionable, values ≥ .50 were considered poor, and values < .50 were considered unacceptable (George & Mallery, 2003; Kline, 2011). As subscales of the ChEDE were significantly skewed (skew > 2, kurtosis > 4), a square root transformation was performed as per the recommendations of Kline (2011). These transformed scores were used in the assessment of construct validity. The assessment of construct validity was conducted on scores from Sample 1 only as measures of body dissatisfaction and
body shame were not available for Sample 2. Construct validity was assessed by correlating scores on the ChEDE Global scale and the brief eight-item scale with scores on the CBIS and OBC-Y.

Given the small proportion of overweight participants and obese participants relative to healthy-weight participants in Sample 2, the overweight and obese groups were combined to form one overweight/obese group (n = 141). The healthy-weight group and overweight/obese group differed significantly with respect to BMI (healthy-weight group: $M = 16.72, SD = 1.41$; overweight/obese group: $M = 23.17, SD = 4.11$), $t(168.28) = -17.55, p < .001$, Cohen’s $d = 2.34$.

Prior to conducting the CFA, suitable estimation methods were examined. As data for the ChEDE were significantly skewed and therefore nonnormal, the weighted least squares mean- and variance-adjusted (WLSMV) estimator implemented in the Mplus program was used to fit the factor model. WLSMV is a robust estimation method that uses a matrix of polychoric correlations and is capable of providing accurate parameter estimates and standard errors in analyses involving multivariate nonnormal variables.

Model fit was evaluated using the root-mean-square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis Index (TLI), weighted root-mean-square residual (WRMR), and chi-square ($\chi^2$). With RMSEA, values ≤ 0.06 indicate good model fit (Hu & Bentler, 1999). With CFI and TLI, values > .95 indicate a close fit and values > .90 indicate an acceptable fit (Hu & Bentler, 1999). Values for WRMR should be < 0.90 (Muthén & Muthén, 1998–2011), and chi-square should be small relative to the degrees of freedom and nonsignificant. Although chi-square is the traditional measure for assessing model fit, there are a number of limitations in its use (for a detailed account of these limitations see Hooper, Coughlan, & Mullen, 2008). As such, the present study also evaluated model fit using Wheaton, Muthén, Alwin, and
Summers’ (1977) relative chi-square, which examines chi-square relative to model degrees of freedom ($\chi^2/df$). As per the recommendations of Ullman (2007), the present study will consider a ratio of 2.00 or less as indicative of acceptable ratio fit.

To examine gender differences, multiple-group analysis was conducted. This analysis compared an unconstrained version of the one-factor eight-item model with increasingly constrained versions that fixed factor loadings and intercepts to be equal across boys and girls. Given it is widely accepted that the testing of equality constraints bearing on error variances and covariances is excessively stringent and rarely achieved (Hair, Black, Babin, & Anderson, 2010; Selig, Card, & Little, 2008), only configural invariance, metric invariance, and scalar invariance were tested. If the constrained and unconstrained models were significantly different, follow-up analyses were conducted with partially constrained models to determine the degree of model stability across each sample. This process was repeated to assess age-group differences.

Missing values on the ChEDE (Sample 1 = 10; Sample 2 = 41) were imputed with the mean of their specified subscale as per the instructions of Fairburn, Cooper, and O’Connor (2008). While this contrasts to recommended data imputation techniques (Enders, 2010; Rubin, 1996; Schafer & Graham, 2002), it may be viewed as appropriate for the ChEDE because it converges with the recommendations of the developers. Missing values predominantly arose on Item 145 (Feelings of Fatness) as overweight participants were not asked this question pertaining to fatness as specified in the ChEDE administration protocol.

Six participants from Sample 1 were dropped from analyses for not completing the assessment battery due to having English as a second language. Finally, data were explored to ensure they met the assumptions required for a CFA. The sample size to estimated parameters ratio was acceptable for Sample 1 (16:247 = 15.44) and Sample 2 (16:288 = 18).
Results

Internal Consistency

Values obtained for Cronbach’s alpha are shown in Table 2. This table shows the Cronbach’s alpha of all ChEDE subscales, the ChEDE Global scale, and the brief eight-item scale for the combined samples (Sample 1 and Sample 2). Additionally, for Sample 1, Cronbach’s alpha is shown in the overall sample and for boys and girls separately. For Sample 2, Cronbach’s alpha is shown in the overall sample, for boys and girls separately, and for healthy-weight and overweight/obese children separately.

The superior reliability of scores on both the Global scale and the brief eight-item scale can be seen in the combined sample, and in the overall samples of both Sample 1 and Sample 2, with internal consistency values ranging from good to excellent. Although the reliability of these scores remained good to excellent in girls, reliability differed in boys. Specifically, internal consistency of the brief eight-item scale was adequate for boys in Sample 1 and good for boys in Sample 2. With the exception of the Shape Concern subscale, the reliability of scores on all other ChEDE subscales ranged from unacceptable to adequate across the subgroups, although reliability of these subscale scores in girls and in overweight/obese children was mostly adequate.
Table 2

Internal Consistency Reliabilities (Cronbach’s Alpha) for the ChEDE Subscales in Both Samples

<table>
<thead>
<tr>
<th>ChEDE</th>
<th>Combined</th>
<th>Sample 1</th>
<th>Sample 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>O  B  G</td>
<td>O  B  G  H  Ov/Ob</td>
</tr>
<tr>
<td>ChEDE</td>
<td>N = 535</td>
<td>N = 247  n = 106 n = 141</td>
<td>N = 288  n = 125 n = 163 n = 147 n = 141</td>
</tr>
<tr>
<td>Restraint</td>
<td>.68</td>
<td>.64 .66 .62</td>
<td>.70 .67 .72 .27 .72</td>
</tr>
<tr>
<td>Eating Conc.</td>
<td>.59</td>
<td>.34 .03 .43</td>
<td>.67 .25 .76 .54 .65</td>
</tr>
<tr>
<td>Weight Conc.</td>
<td>.76</td>
<td>.73 .33 .77</td>
<td>.75 .73 .76 .33 .76</td>
</tr>
<tr>
<td>Shape Conc.</td>
<td>.88</td>
<td>.86 .62 .89</td>
<td>.89 .86 .90 .64 .89</td>
</tr>
<tr>
<td>Brief 8-item</td>
<td>.89</td>
<td>.88 .70 .90</td>
<td>.89 .88 .89 .69 .90</td>
</tr>
<tr>
<td>Global Score</td>
<td>.91</td>
<td>.89 .80 .91</td>
<td>.92 .90 .93 .73 .92</td>
</tr>
</tbody>
</table>

*Note. ChEDE = Children’s Eating Disorder Examination (Bryant-Waugh et al., 1996); O = Overall, B = Boys, G = Girls, H = Healthy-weight, Ov/Ob = Overweight/Obese*
Construct Validity

As a test of construct validity, the ChEDE Global scale and brief eight-item scale were compared to measures of body dissatisfaction and body shame. Pearson bivariate correlations showed that CBIS body dissatisfaction scores were significantly and positively correlated with scores on the ChEDE Global scale ($r = .30, p < .001$) and brief eight-item scale ($r = .32, p < .001$). Similar results were obtained for body shame, with correlations of .44 ($p < .001$) for the Global scale and .45 ($p < .001$) for the brief eight-item scale. These findings were replicated in both boys and girls for the ChEDE Global scale (body dissatisfaction boys: $r = .21, p < .05$; body shame boys: $r = .39, p < .001$; body dissatisfaction girls: $r = .32, p < .001$; body shame girls: $r = .50, p < .001$), and the brief eight-item scale (body dissatisfaction boys: $r = .22, p < .05$; body shame boys: $r = .31, p < .01$; body dissatisfaction girls: $r = .34, p < .001$; body shame girls: $r = .56, p < .001$).

Confirmatory Factor Analysis

When the one-factor eight-item model of the ChEDE was fitted to the data from Sample 1, a converged, admissible solution was obtained. The chi-square statistic was significant, $\chi^2(20) = 108.46, p < .001$. Relative chi-square was 5.42, exceeding the critical ratio of 2.00 stipulated for this study. Fit indices for this model (Table 3) indicate that the hypothesized factor model of the ChEDE was a poor fit to the data with RMSEA > .05 and WRMR > 0.90.
Table 3

**Fit Indices for the One-Factor ChEDE Model and Modified One-Factor ChEDE Model**

<table>
<thead>
<tr>
<th>Goodness of fit statistics</th>
<th>CFI</th>
<th>TLI</th>
<th>WRMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-factor ChEDE model</td>
<td>.96</td>
<td>.94</td>
<td>0.99</td>
<td>0.13</td>
</tr>
<tr>
<td>Modified one-factor ChEDE model</td>
<td>1.00</td>
<td>1.00</td>
<td>0.42</td>
<td>0.03</td>
</tr>
</tbody>
</table>

*Note.* ChEDE = Children’s Eating Disorder Examination (Bryant-Waugh et al., 1996); TLI = Tucker–Lewis index; CFI = comparative fit index; WRMR = weighted root-mean-square residual; RMSEA = root-mean-square error of approximation.

All individual parameters, however, loaded strongly and significantly with loadings between .54 and .90. Modification indices suggested multiple covariances among the observed variables, notably the inclusion of a covariance pathway between the importance of shape and the importance of weight items (MI value = 85.96). These items assess the importance of shape and weight respectively, and both items are answered according to the outcome of a practical sorting task. Given this methodological link between the two items, and the link between weight and shape, the inclusion of this pathway is theoretically justified and was employed. When the covariance pathway was added to the model, a converged admissible solution was obtained. The modified model provided an excellent fit to the data, $\chi^2(19) = 24.02, p = .20$. Relative chi-square was 1.26, and fit indices for this model (Table 3) indicate that the modified model was an excellent fit to the data with RMSEA < .05, TLI and CFI > .98, and WRMR < 0.90. Additionally, all individual parameters continued to load strongly and significantly with loadings between .56 and .93 (Figure 1). The added covariance pathway was also significant.

Given that the modification to the model was data-driven, the modified model was fitted to the data of Sample 2 to cross-validate the results.
square statistic was significant, $\chi^2(19) = 36.31, p < .01$, however relative chi-square, calculated as 1.90, was less than the critical ratio of 2.00, and fit indices for this model indicate that the modified model was an adequate to excellent fit to the data with an RMSEA of .06, TLI and CFI of 1.00, and WRMR of 0.47. Additionally, all individual parameters loaded strongly and significantly with loadings between .60 and .95. The added covariance pathway was also significant.

![Figure 1](image)

**Figure 1.** Standardized item coefficients (and standard errors) for a modified one-factor eight-item model of the Children’s Eating Disorder Examination (ChEDE; Bryant-Waugh et al., 1996) in Sample 1. The covariance pathway added following modification to the model is depicted by the broken line.

**CFA gender differences.** Given the low cell counts for higher scores on the ChEDE, multiple-group measurement invariance could not be run using the WLSMV estimator. As such, these analyses were conducted using the maximum-likelihood estimation with robust standard errors (MLR) as this estimator is robust to violations of normality.
Given the use of the MLR estimator, the standardized root-mean-square residual (SRMR) was used instead of the WRMR. A value < .08 is indicative of adequate fit for the SRMR (Hu & Bentler, 1999).

As a preliminary analysis, the model depicted in Figure 1 was assessed separately for boys and girls. The measurement model, with all indicators freely estimated and factor variances set to 1, was an adequate fit in both genders, though a better fit in girls (boys: $\chi^2(19) = 31.15, p = .04, \chi^2/df = 1.64$, CFI = .96, TLI = .94, RMSEA = 0.05 [90% CI = 0.01, 0.09], SRMR = .06; girls: $\chi^2(19) = 21.74, p = .30, \chi^2/df = 1.14$, CFI = 1.00, TLI = .99, RMSEA = 0.02 [90% CI = 0.00, 0.06], SRMR = .02).

Additionally, inspection of the factor loadings for both boys and girls revealed that each indicator loaded significantly on the specified latent. Given this consistency, formal testing could proceed.

First, a baseline model was specified in which all parameters were freely estimated. The latent variables were fixed to 1.00 and the latent variable means were fixed to 0 in each group for identification purposes. The fit indices and model chi-square resulting from this specification are presented in Table 4. As can be seen, the model with all parameters freely estimated across genders fit the data well although overall chi-square was significant.

Second, to test for metric invariance, the chi-square from the baseline model was compared to a model where only factor loadings were constrained to be equal across groups. Fit indices and model chi-square from this constrained model can be seen in Table 4. When the difference between this model and the baseline model was evaluated statistically via the hand-calculated MLR chi-square difference test, a significant difference in fit was found, $\chi^2(8) = 18.07, p < .02$, indicating a significant drop in model fit for the full metric invariance model in comparison to the baseline model. The modification indices, however, did not suggest any points of localized misfit for the
constrained factor loadings. As such, the freely estimated factor loadings from the baseline model were examined for large absolute differences between boys and girls. Item ChEDE144 (*Avoidance of Exposure*) had the largest overall difference between boys and girls. As such, this variable was freely estimated and the metric invariance model compared once more to the baseline model. No difference in fit between the baseline model and the partially invariant metric invariance model was found, $\chi^2(7) = 11.91, p = .10$.

Given that only one indicator was found to be noninvariant across boys and girls, the degree of partial measurement invariance was sufficient to carry out further invariance analyses (Brown, 2006; Hair et al., 2010). The extent to which the commonly specified residual covariance between ChEDE140 and ChEDE141 was invariant across groups was therefore examined. The chi-square from the baseline model was compared to a model where both factor loadings (with the exception of ChEDE144) and the residual covariance were constrained to be equal across groups. Fit indices for this model can be seen in Table 4. No difference in fit was found, $\chi^2(8) = 12.71, p = .12$. The modification indices did not suggest any points of localized misfit.

Finally, scalar invariance was examined. To test for scalar invariance, the chi-square from the baseline model was compared to a model where factor loadings (with the exception of ChEDE144), the residual covariance, and variable intercepts were constrained to be equal across groups. Fit indices for this model can be seen in Table 4. When the difference between this model and the baseline model was evaluated statistically, a significant difference in fit was found, $\chi^2(16) = 29.39, p = .02$. The modification indices did not suggest any points of localized misfit for the constrained intercepts. As such, freely estimated intercepts from the baseline model were examined for large absolute differences between boys and girls. The intercept for Item ChEDE141 (*Importance of Weight*) had the largest overall difference between boys and girls. When
this variable was freely estimated and the partial scalar invariance model compared to
the baseline model, a significant difference in fit was still found, albeit the difference
was reduced ($\chi^2(15) = 28.30, p = .02$). Fit indices for this model can be seen in Table 4.
Additional intercepts were therefore freed one at a time, however the drop in chi-square
was minimal for each change in degrees of freedom and other fit indices did not
significantly improve. As such, in line with B. M. Byrne (2012), the partially scalar
invariant model with ChEDE141 freely estimated was considered to appropriately
represent the final test of intercepts related to the ChEDE.

Table 4

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2$/df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline Model</td>
<td>53.22</td>
<td>38</td>
<td>1.40</td>
<td>.98</td>
<td>.98</td>
<td>0.04</td>
<td>.04</td>
</tr>
<tr>
<td>2. Metric Invariance</td>
<td>74.38</td>
<td>46</td>
<td>1.62</td>
<td>.97</td>
<td>.96</td>
<td>0.05</td>
<td>.14</td>
</tr>
<tr>
<td>3. Partial Metric Invariance</td>
<td>66.02</td>
<td>45</td>
<td>1.47</td>
<td>.98</td>
<td>.97</td>
<td>0.04</td>
<td>.11</td>
</tr>
<tr>
<td>(ChEDE144 loading freely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>estimated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Residual Covariance</td>
<td>66.48</td>
<td>46</td>
<td>1.45</td>
<td>.98</td>
<td>.97</td>
<td>0.04</td>
<td>.11</td>
</tr>
<tr>
<td>Invariance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Scalar Invariance</td>
<td>82.44</td>
<td>54</td>
<td>1.53</td>
<td>.97</td>
<td>.97</td>
<td>0.04</td>
<td>.12</td>
</tr>
<tr>
<td>6. Partial Scalar Invariance</td>
<td>81.52</td>
<td>53</td>
<td>1.54</td>
<td>.97</td>
<td>.97</td>
<td>0.05</td>
<td>.12</td>
</tr>
</tbody>
</table>

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-
square error of approximation; CI = confidence interval; SRMR = standardized root-
mean-square residual; ChEDE = Children’s Eating Disorder Examination (Bryant-
Waugh et al., 1996).
**CFA age differences.** The procedure outlined above for invariance testing across genders was replicated for invariance testing across age groups. Participants were split into two age groups (6- to 8-year-olds and 9- to 11-year-olds).

As a preliminary analysis, the model depicted in Figure 1 was assessed separately for these age groups. The measurement model, with all indicators freely estimated and factor variances set to 1, was a better fit in the 9- to 11-year-olds, $\chi^2(19) = 30.77, p = .04, \chi^2/df = 1.62$, CFI = .98, TLI = .97, RMSEA = 0.05 (90% CI = 0.01, 0.08), SRMR = .03, than in the 6- to 8-year-olds: $\chi^2(19) = 49.22, p < .001, \chi^2/df = 1.14$, CFI = .94, TLI = .91, RMSEA = 0.07 (90% CI = 0.05, 0.10), SRMR = .05. As inspection of the factor loadings for both age groups revealed that each indicator loaded significantly on the latent variable, formal testing could proceed.

The fit indices and model chi-square resulting from a baseline model in which all parameters were freely estimated are presented in Table 5. As can be seen, the model with all parameters freely estimated across age groups provided an adequate fit to the data although overall chi-square was significant.

The fit indices and model chi-square resulting from a metric invariance model in which only factor loadings were constrained to be equal across groups are presented in Table 5. When the difference between this model and the baseline model was evaluated statistically via the hand-calculated MLR chi-square difference test, a significant difference in fit was found, $\chi^2(8) = 33.31, p < .001$, indicating a significant drop in model fit for the full metric invariance model in comparison to the baseline model. Inspection of modification indices revealed that item ChEDE138 (*Dissatisfaction with Shape*) was particularly problematic. This variable was freely estimated and the metric invariance model compared once more to the baseline model. A significant difference between the baseline model and the partially invariant metric invariance model remained, $\chi^2(7) = 16.52, p = .02$, however the modification indices did not suggest any
further points of localized misfit for the constrained factor loadings. As the model was found to be noninvariant across age-groups at the metric level, further analyses were not conducted.

Table 5

Summary of Mplus Tests for Measurement Invariance Across Age Groups

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2$/df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA [90% CI]</th>
<th>SRMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline Model</td>
<td>78.94</td>
<td>38</td>
<td>2.08</td>
<td>.96</td>
<td>.94</td>
<td>0.06 [0.04, 0.08]</td>
<td>0.04</td>
</tr>
<tr>
<td>2. Metric Invariance</td>
<td>118.33</td>
<td>46</td>
<td>2.57</td>
<td>.93</td>
<td>.91</td>
<td>0.08 [0.06, 0.09]</td>
<td>0.16</td>
</tr>
<tr>
<td>3. Partial Metric Invariance</td>
<td>96.08</td>
<td>45</td>
<td>2.14</td>
<td>.95</td>
<td>.94</td>
<td>0.07 [0.05, 0.08]</td>
<td>0.12</td>
</tr>
<tr>
<td>(ChEDE138 factor loading freely estimated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval; SRMR = standardized root-mean-square residual; ChEDE = Children’s Eating Disorder Examination (Bryant-Waugh et al., 1996).

Discussion

The present study sought to psychometrically evaluate a brief eight-item model of the ChEDE by examining the reliability and factor structure of its scores in two community-based samples of children, one including overweight and obese children. The reliabilities obtained for all subscales in the present study are comparable to those obtained by Wade et al. (2008). In the combined sample of participants, and in Sample 1 and Sample 2 overall, the brief eight-item scale demonstrated good reliability, and the Global scale demonstrated excellent reliability. The reliability of these two scales was
superior to all other subscales, supporting previous research by S. M. Byrne et al. (2010) and Wade et al. (2008).

When the reliability of the brief eight-item scale was examined separately in boys and girls, a varied picture emerged. Cronbach’s alpha was good to excellent in both samples of girls in the present study. Additionally, the alpha of .90 obtained when girls of both samples were combined is consistent with previous research by Wade et al. (2008) who obtained a Cronbach’s alpha of .91 in their female sample. The consistency across samples, and across studies, suggests that scores on this brief eight-item scale are a reliable measure of eating disorder symptoms in girls. In boys however, reliability was mixed (albeit still adequate) across both samples used in the present study suggesting that further research into the applicability of this eight-item scale in boys is warranted.

Scores on the Global scale, however, were good to excellent in boys and girls of both samples, and the Cronbach’s alpha obtained for the combined two samples of girls (.93) is comparable to the alpha of .91 obtained by Wade et al. (2008). As such, in settings where assessment lengths are not problematic and administration of the entire ChEDE protocol is feasible, use of the Global scale as an index of eating disorders symptoms over the brief eight-item scale is recommended.

The superior reliability of the eight-item scale and Global scale was also demonstrated in each of the weight classification categories of Sample 2. In healthy-weight and overweight/obese participants, these scales demonstrated superior reliability in comparison to the Weight Concern and Shape Concern subscales, supporting previous research by S. M. Byrne et al. (2010). It is important to note however, that in healthy-weight participants, the brief eight-item scale was only bordering on acceptability. Indeed, all subscale reliabilities were significantly lower in healthy-weight participants. This result is not surprising given the ChEDE was originally intended for use as a diagnostic tool in clinical populations.
Results from the CFA provide some support for these reliability findings. Although the initial specification of the one-factor eight-item model did not provide an acceptable fit to the data for the first community-based sample, the inclusion of a covariance pathway between two highly related items assessing the importance of shape and importance of weight, respectively, substantially improved the fit of this model. When this data-driven model was fitted to the data from the second community-based sample, fit indices suggested excellent fit, although model chi-square was significant suggesting further replication is required. These findings are comparable however, to those of Allen, Byrne, Lampard, Watson, and Fursland (2011) who conducted a confirmatory factor analysis of the Eating Disorder Examination Questionnaire (EDE-Q) in a community-based and an eating-disordered sample of adults. In their study assessing several proposed factor structures of the EDE-Q, the only model to provide an acceptable fit to the data was the brief one-factor eight-item model. This model demonstrated acceptable fit to the data in both the eating disordered and community-based samples. It was also the only model, of the three retained for multiple-group analysis, to demonstrate measurement stability across groups. Combined with the results from the present study, this suggests that the brief one-factor eight-item model should be retained over other suggested factor structures.

The measurement invariance testing process demonstrated that the one-factor eight-item model of the ChEDE was partially invariant across genders, with boys and girls differing on the avoidance of exposure item. Factor loadings suggested that this parameter estimate was larger in girls than in boys. Although this suggests that comparing boys and girls on the eight-item scale may be problematic, the item in question did significantly load on the latent variable for both boys and girls. As such, researchers may still compare boys and girls on this measure, however further investigation of the avoidance of exposure item is recommended as this item may be
useful for researchers wanting to explore differences in the presentation of eating disorders across boys and girls.

Measurement testing examining invariance across age groups demonstrated that the brief eight-item model of the ChEDE significantly differed across age groups, providing a better fit to the data in the older children (9- to 11-year-olds). This brings into question the stability of the measure when used with very young participants. Researchers should therefore be cautious when comparing children of different age groups and at different developmental stages as items of the ChEDE may have a different meaning and may or may not be sufficiently stable depending on the age of participants being examined. It is also worth noting that Sample 2 comprised children ages 8 to 11 years. By contrast, Sample 1 comprised children ages 6 to 11 years. It is therefore possible that the invariance demonstrated across age groups may have been due to sample differences in addition to age differences. Further investigation of measurement invariance across age groups is therefore needed.

Finally, tests of construct validity revealed that the brief eight-item scale correlated significantly with measures of body dissatisfaction and body shame. This is not surprising given the eight-item scale comprises items from the Weight and Shape Concern subscales of the ChEDE. As such, although these validity findings support the use of the eight-item scale as a cognitive and affective measure of eating disorder symptoms, comparison of this scale to other scales that assess both cognitive and behavioural eating disorders symptoms (such as the Eating Attitudes Test; Garner & Garfinkel, 1979), is warranted.

**Strengths and Limitations**

The large sample size of the present study allowed for the use of CFA to test the theoretical model in two separate samples. The use of CFA as a statistical technique gave several advantages over regression modelling, including its more flexible
assumptions, its ability to test models overall rather than coefficients individually, and its ability to offer an index of how well the proposed model fit the given data set. This constituted a significant strength of the present study. However, the present study had some limitations that need to be taken into account when interpreting the findings. First, the requirement of active parental consent resulted in a low participation rate of approximately 10% for Sample 1. Although it is typical for consent rates of studies requiring active consent to be significantly lower than those requiring passive consent (Pokorny, Jason, Schoeny, Townsend, & Curie, 2001), it cannot be assumed that the sample was representative of the population from which it was drawn.

Second, the poor reliability coefficients obtained for the original subscales of the ChEDE and the significant covariance found between the importance of shape and importance of weight items may be due to the limited cognitive abilities in this young age group. Specifically, children may not be able to understand certain aspects of the ChEDE, such as the distinction between weight and shape. They may also struggle with the conceptually difficult items that contain both a cognitive and a behavioural element, requiring children to make distinctions between intending to (“wanting”), attempting to (“trying”), and actually performing a behaviour (Goldschmidt, Doyle, & Wilfley, 2007). This is reflected in the multiple-group CFA whereby the eight-item model of the ChEDE provided a significantly better fit to the data in older children than in younger children. Despite this, an advantage of the ChEDE is that the interview process provides the opportunity for the interviewer to ensure the participant has a clear understanding of the different concepts by explaining each question clearly, increasing the chances that the child understands the complex nuances of some items. However, it is also important to note the possibility that results of the present study were influenced by the reliability of ChEDE administrations. Although care was taken to ensure assessment fidelity, and scores obtained by participants on the ChEDE were checked with the interviewer in the
event of an unclear rating, interrater reliability was not examined. As such, it is possible that the degree of variability in ChEDE administration, particularly given the range of training and clinical experience of interviewers, may have influenced the outcomes of the present analyses.

Finally, the use of a community-based sample precluded generalisation to children diagnosed with an eating disorder. The reporting of dietary restraint and the use of extreme methods of weight control in the first sample of participants was very uncommon, resulting in little variance on the subscales. Larger reliabilities on the ChEDE may have been found if there was a greater severity of symptoms or greater variability in responses. Despite this, the finding that reliability was good to excellent for the brief eight-item scale and Global scale in this community-based sample suggests that the use of the scale can extend to nonclinical settings.

**Conclusion**

In summary, results provide support for the retention of a one-factor, eight-item model of the ChEDE and a global score based on all subscale items. Given the consistency across studies, it can be suggested that the brief eight-item scale of the ChEDE may be useful, particularly when scores on the specific subscales are not needed. In clinical settings where administration of the entire scale is important, a global score based on all subscale items has consistently been found to be more reliable than scores on the original four subscales. Additional research is required to extend and replicate these findings, particularly in boys, and with a broader range of young children diagnosed with anorexia nervosa, bulimia nervosa and the various forms of eating disorder not otherwise specified.
References


Appendix B

Images Used in the Modified SOQ

Muscles (girls)  Muscles (boys)

Energy (girls)  Energy (boys)
Strength (girls)

Strength (boys)

Coordination (girls)

Coordination (boys)
Appendix C

Modified Self-Objectification Questionnaire (Adapted from Noll & Fredrickson, 1998)

M I Jongenelis, S M Byrne, S Pettigrew

Now I wonder if you can help me with something. I’d like to find out how people think about their bodies. I’m going to show you pictures of 10 different things about your body. I would like you to look at these 10 pictures and number them in order, with the thing that is most important about how you think about yourself as number one, and then the next most important as number two and so on down until you get to the one thing that is the least important to how you think about yourself. So for example if how much energy you have is the most important thing to you about how you think about yourself, you put the energy picture on top of the number 1 [model this action]. It doesn’t matter if you don’t have a lot of energy; these questions are asking if energy is important, not if you are good or bad at it. Do you understand this? Ok, so let’s look at the pictures.

Display pictures of coordination, health, weight, height, strength, good-looking, energy, muscles, fitness, and measurements to the participant. Read aloud each attribute and say the following depending on the attribute being presented:

So when thinking about yourself...

1. How important is your coordination, so how well you throw and catch a ball, or dribble a soccer ball, or hit a ball with a baseball bat?
2. How important is your health? So how healthy you are?
3. How important is your weight? So how much you weigh?
4. How important is your strength? So how strong you are?
5. How important is your height? So how tall you are?
6. How important are your looks? So how good-looking or pretty you are?

7. How important is your energy? So how much energy you have?

8. How important are your muscles? So how muscley you are?

9. How important is your fitness? So how fit you are?

10. How important are your measurements, so your chest, waist and hip measurements, or how big your tummy or legs are?

Great! Now think about all the things on the pictures and put them in order on the numbers. Remember number 1 is most important thing to you and number 10 is the least important thing to you. You can’t put two pictures on the same number and there are no right or wrong answers. Remember this about how you think and feel about yourself, not what other people think you should put ok?

[Display pictures again and assist child if they are having difficulties. Once child is finished, go through what they have done and ask them “Are you happy with that?” This is to ensure they have allocated with 1 as most important and 10 as least important]