

Effects of Weight Teasing on Body Esteem in Youth with  
Overweight and Obesity: A Longitudinal Investigation of  
Protective Factors

by

Darcie D. Valois

A thesis submitted to the Faculty of Graduate and Postdoctoral  
Affairs in partial fulfillment of the requirements for the degree of

Master of Arts

in

Psychology

Carleton University  
Ottawa, Ontario

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Darcie D. Valois

## Abstract

The stigma associated with obesity puts youth at risk for weight-based teasing. However, not all youth who are weight-teased develop body dissatisfaction. This study examined whether secure attachment and social support are protective factors that may buffer the negative effects of weight teasing on body esteem. Participants were overweight and obese youth ( $N = 277$  at T1, 54% female;  $M$  age = 13.43) who completed surveys annually for 4 years. Multilevel modeling showed that weight teasing negatively predicted body esteem. A peer teasing by attachment interaction was also found such that those with a secure attachment reported higher weight esteem than those with an insecure attachment. Contrary to our hypothesis, peer teasing was more strongly and negatively related to weight esteem for those securely attached compared to insecurely attached. Findings suggest that attachment style and weight teasing should be considered in body dissatisfaction treatment and prevention strategies in overweight/obese youth.

### Acknowledgements

I would first like to thank my supervisors Chris Davis and Gary Goldfield for their guidance, support, patience, and commitment to my success over the course of my M.A. I have learned so much from each of you, and am incredibly thankful for the opportunity to work with you both. Thank you for providing me with the opportunity to find an area of research I am truly passionate about.

I would like to thank all the staff and students I have had the pleasure of working with and getting to know at HALO. It has truly been an amazing opportunity working with such a diverse group of multi-talented people. I also would like to thank Annick Buchholz, Megan Lamb and everyone at CHAL for the opportunities, amazing experiences, and support during the last stretch of my degree.

I would like to thank my committee members for their time, and the staff at the psychology department at Carleton for always going above and beyond for students.

I would like to thank my lab mates at Carleton. I am grateful for the continued companionship and support throughout the highs and lows of grad school, and I can't imagine experiencing it with anyone else. I would also like to thank my friends from joint lab, and the friends I made during my time in the program. The support and encouragement was invaluable, and grad school was a brighter place with all of you in it.

Finally, I would like to thank my closest friends, family, and partner for your unwavering support throughout this crazy process. Thank you for being there through the tears and the laughs, the struggles and the triumphs. Thank you for always believing in me, I wouldn't be where I am today without you all.

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Effects of Weight Teasing on Body Esteem in Youth with Overweight and Obesity:  
A Longitudinal Investigation of Protective Factors

Childhood obesity is a condition characterized by excess accumulation of body fat that poses a risk to overall health (World Health Organization, 2016). The prevalence of childhood obesity has seen a dramatic increase in the past 25 years (Shields, 2005), reaching epidemic proportions in developed countries over the past 4 decades. Recent epidemiological studies indicate that approximately one third of Canadian adolescents are overweight (body mass index (BMI)  $\geq$  85th percentile) or obese (BMI  $\geq$  95% based on age and sex-adjusted population growth charts; Roberts, Shields, de Groh, Aziz & Gilbert, 2012).

Although efforts to manage obesity have focused on reducing body weight through proper nutrition and exercise, little has been done to address the psychosocial impact of this condition. Previous research shows that obesity is highly stigmatized in Western society, making youth with overweight and obesity vulnerable to bias, stereotyping, and victimization (see Puhl & Latner, 2007 for a review). These adverse experiences could have a lasting psychological impact and hinder social, emotional, and academic development while also exacerbating physical health outcomes (e.g. Daniels, 2006; Weiss & Caprio, 2005). Thus, it is important to ensure adolescents living with overweight or obesity are psychologically healthy.

Not surprisingly, people (particularly adolescents) with obesity tend to be dissatisfied with their body, and research indicates that body dissatisfaction is cross-sectionally and prospectively associated with a wide range of poor psychological outcomes (e.g. Florin, Shults, & Stettler, 2011; Holsen, Kraft & Roysamb, 2001; Marti,

Stice, & Springer, 2010; Page, Scanlan & Allen, 1995; Polivy & Herman, 1985; Schooler, 2013; Stice & Shaw, 2003). Thus, addressing body image concerns in adolescents with overweight and obesity could potentially have a positive impact on mental health and wellbeing. In order to achieve this, it is important to understand the main determinants of body dissatisfaction in youth with obesity in order to mitigate these effects. I first review the relevant literature on body esteem during adolescence, as well as the interpersonal theory of body dissatisfaction. I then review the literature detailing the stigma and discrimination associated with childhood obesity, and finally suggest potential protective factors that may mitigate these negative effects on body esteem.

### **Body Image**

Adolescence is a period characterized by identity development as adolescents attempt to make sense of themselves and define who they are (Erikson, 1968). Though researchers have suggested a multitude of constructs that contribute to an adolescent's identity, such as academic competence, popularity, social acceptance, and romantic appeal, it has been argued that adolescents' perceptions of their own physical appearance contribute most significantly to their overall sense of self (Harter, 2001; 2003).

Body image is a multidimensional construct that describes an individual's mental representation of his or her own body (Cash & Pruzinsky 1990; Garner & Garfinkel 1981), including perceptions, thoughts, and feelings related to his or her own physical appearance (Cash, Thériault, & Annis, 2004; Grogan, 2008). In line with this, Fischer (1990) conceptualized body image as being derived from the collective impact of body-related experiences an individual encounters during his or her lifespan. These include an individual's actual body structure and function, body-related experiences, the social

response to body appearance, and the sociocultural values and ideals related to body appearance. In most research, body esteem is operationalized as the individual's subjective sense of satisfaction or dissatisfaction with his or her body and physical appearance (Alasker, 1992). Those with a positive body image value their bodies not merely for its physical appearance, but have genuine appreciation for its physical capabilities (Tylka, 2011). They also tend to have positive self-esteem, healthy attitudes toward food and eating, and are better able to resist external pressures to conform to societal beauty standards (Ricciardelli & Yager, 2016). On the other hand, body dissatisfaction is characterized as the negative subjective evaluations of one's physical body, including overall figure, weight, stomach and hips (Stice & Shaw, 2002) and represents a discrepancy between self-perceived current and ideal body size estimates by an individual (Amburgey, 2009). Larger discrepancies between self-perceptions and idealized images result in body dissatisfaction, and smaller discrepancies typically result in greater body satisfaction.

Although some degree of body dissatisfaction in adolescents is common at one time or another, some are more prone to it than others. A significant body of research supports the idea that adolescent girls are more dissatisfied with their bodies than boys. For instance, three large community-based studies assessed the proportion of adolescent girls and boys reporting body dissatisfaction and found that the proportion of girls who reported body dissatisfaction varied between 24% and 46%, whereas the respective proportions of boys reporting body dissatisfaction ranged from 12% to 26% (Presnell, Bearman & Stice, 2004; Neumark-Sztainer, Story, Hannan, Perry & Irving, 2002b; Stice & Whitenton, 2002). Gender differences also exist in terms of body surveillance (e.g.

“during the day, I think about how I look many times”), body shame (e.g. “I feel like a bad person when I don’t look as good as I could”), and appearance anxiety (e.g. “I worry how others are evaluating the way I look”) where adolescent girls score higher than boys in all three domains (Slater & Tiggerman, 2010). In addition, girls primarily focus on the aesthetic qualities of their bodies, which they subsequently evaluate more negatively and express greater desire to change than do boys (Abbott & Barber, 2011).

Previous research has identified a strong relation between body image and weight classification where youth with overweight and obesity consistently report greater body dissatisfaction compared to their normal weight peers (Goldfield et al., 2010a). This is particularly true for overweight girls, who report greater levels of body dissatisfaction than overweight boys (Ricciardelli & McCabe, 2001; Wardle & Cooke, 2005). One potential explanation for these findings is the influential messages about body image and weight put forth by the mainstream Western media. Studies suggest that the average adolescent living in North America is exposed to between 6-8 hours of screen time per day (Leatherdale & Harvey, 2015), which may result in exposure to thousands of images depicting unrealistic and unattainable beauty standards, which then get internalized (Grabe, Warde & Hyde, 2008). Indeed, those with a higher BMI have a body composition that is quite different than sociocultural ideals, and are thus more likely to experience increased pressure to be thin and have toned muscles (Garner, 1997; Stice & Whitendon, 2002). This, taken together with the societal stigma surrounding overweight and obesity, is thought to engender intense feelings of shame, guilt, and body dissatisfaction among those with overweight and obesity (Friedman & Brownell, 2002).

Body dissatisfaction has been consistently linked to adverse mental and physical health consequences in adolescents. For instance, research has identified links between body dissatisfaction and depressive symptoms both cross-sectionally (Wickstrøm, 1998) and longitudinally, where body image predicted changes in depressed mood over time for both male and female adolescents (Allgood-Merten, Lewinshon, & Hops, 1990; Holsen et al., 2001). Body dissatisfaction was also found to be associated with increased risk of suicidality in adolescents (Crow, Eisenberg, Story, & Neumark-Sztainer, 2008), as well as risky health behaviors such as unsafe sexual practices (Schooler, 2013; Stice & Shaw, 2003) and substance abuse (e.g. Page et al., 1995; Marti et al., 2010). Aside from the negative psychological and physical impact, body dissatisfaction has also been linked to academic potential, where body dissatisfaction is associated with poor academic achievement (Yanover & Thompson, 2008; Florin et al., 2011) and attendance at school (Lovegrove & Rumsey, 2005). Indeed, the importance of healthy body esteem during adolescence should not be underestimated, as one study found that body image had the strongest impact on health-related quality of life for 8-18 year old children, even more than BMI, pain, and being bullied (Haraldstad, Christophersen, Eide, Natvig & Helseth, 2011).

The prospective impact of body dissatisfaction on weight-related outcomes (i.e. disordered eating, overweight, obesity) in adolescents has been brought to attention during the past two decades with two large longitudinal studies: The Eating Among Teens (EAT) study (e.g. Ackard, Fulkerson, & Neumark-Sztainer, 2011a, b; Haines, Neumark-Sztainer, Wall, & Story, 2007; Neumark-Sztainer, Wall, Eisenberg, Story, & Hannan, 2006a; Neumark-Sztainer et al., 2007; Neumark-Sztainer, Story, Hannan, Perry

& Irving, 2002b) and the Growing Up Today study (GUTS; e.g. Field et al., 1999; Field, Haines, Rosner, & Willett, 2010; Field et al., 2008; Haines Kleinman, Rifas-Shiman, Field & Austin, 2010). Each study followed a large cohort of adolescents over a span of 5-10 years with the goal of identifying socio-environmental, personal, and behavioral risk and protective factors for adverse weight-related outcomes such as overweight, extreme weight control (e.g. laxative use), and disordered eating (e.g. binge eating, purging). Of the risk factors identified in the studies that have since followed, body dissatisfaction is one that repeatedly emerged as a risk factor for both overweight and disordered eating. The studies demonstrating the prospective negative impact of body dissatisfaction from project EAT and GUTS will be discussed in greater detail.

Neumark-Sztainer and colleagues (2007) assessed how weight concern at Time 1 predicted adverse weight-related outcomes (i.e. overweight, binge eating, and extreme weight control) five years later. One third of participants were in middle school at Time 1 (mean age = 12.8 years at Time 1, and 17.2 years at Time 2), and two thirds were in high school (mean age = 15.8 years at Time 1, and 20.4 years at Time 2). They found that concern with weight at Time 1 predicted all three weight-related outcomes (overweight, binge eating, and extreme weight control) five years later for both girls and boys; and body dissatisfaction at time 1 predicted two or more weight-related outcomes (i.e. overweight, binge eating, or extreme weight control) five years later for girls. In line with this, Haines and colleagues (2010) found that concern with weight at Time 1 was prospectively associated with all three weight-related concerns (i.e. binge eating, purging, and overweight) for girls, and two of three weight related concerns (i.e. binge eating, overweight) for boys during a three-year follow up period.

Ackard and colleagues (2011a) assessed how body image disturbances at time 1 (mean age 15) predicted body image disturbances and eating disorders (as well as their classifications) five years later (mean age 20.4 at follow up). They found that approximately 15% of boys and 30% of girls who reported only body dissatisfaction (and no disordered eating) at Time 1 reported greater body dissatisfaction, had initiated disordered eating behaviors (i.e. binge eating, use of compensatory behaviors), or met threshold diagnostic criteria for bulimia nervosa (BN) or binge eating disorder (BED) at Time 2. In addition, nearly half of the adolescent boys and two-thirds of adolescent girls who were subthreshold symptomatic (i.e. binge eating/compensatory behaviors not meeting full diagnostic criteria, body image disturbance without disordered eating behaviors) at Time 1 remained symptomatic at Time 2, with several cases progressively worsening to meet criteria for a threshold eating disorder. These results are alarming given the apparent progression of body image concerns to subthreshold and clinical diagnoses of eating disorders.

Other prospective research from both EAT and GUTS suggests that positive body esteem may be protective against weight-gain and disordered eating for both male and female adolescents. Haines and colleagues (2007) found that body satisfaction at Time 1, and increases in body satisfaction between Time 1 and 2 (a period of five years) were inversely associated with overweight at time 2 for both boys and girls, whereas body dissatisfaction and weight concerns at Time 1 predicted overweight at Time 2 for both male and female adolescents. Interestingly, other studies have found similar results in samples of adolescents with overweight and obesity. A series of studies found that girls with overweight and obesity who had high body esteem at time 1 reported less weight

gain and binge eating after 5 years (Neumark-Sztainer et. al., 2006; van den Berg & Neumark-Sztainer, 2007), then 10 years (Loth, Watts, van den Berg, & Neumark-Sztainer, 2015) compared to their peers with lower body esteem. Another study mirrored these results, showing that overweight and obese girls who were satisfied with their bodies gained less weight and engaged in less unhealthy eating behaviors (i.e. binge eating) over a period of 11 years compared to peers who were dissatisfied with their bodies (Sonneville et al., 2012).

The results of these studies taken together suggest that body satisfaction- as well as increases in body satisfaction over time- may be protective against weight gain and disordered eating for both male and female adolescents across the weight spectrum. The results pertaining to adolescents who are overweight and obese are particularly insightful as they challenge the notion that body dissatisfaction is adaptive insofar as it motivates weight loss (e.g. Heinberg, Thompson, Matzon, & Strelig-Moore, 2001). Rather, these findings add further support to the literature showing the harmful effects of body dissatisfaction on both physical and mental health, and strengthen the argument that interventions targeting improved body image could have positive effects on wellbeing for adolescents who are at high risk, such as those with overweight and obesity. Given that weight concerns and body dissatisfaction were identified as risk factors for adverse weight-related outcomes in the longitudinal research mentioned, interventions targeting body esteem could prove successful in preventing these outcomes. Indeed, future research should focus on ways to promote positive body esteem in youth with overweight and obesity as increasing body esteem may attenuate future weight gain, increase wellbeing, and help reduce the risk of psychopathology associated with body

dissatisfaction. However, it is important to first understand factors that contribute to the development of body dissatisfaction in order to mitigate these effects.

### **Interpersonal Theory of Body Dissatisfaction**

As previously mentioned, body image is an individual's mental representation of his or her own body (Cash & Pruzinsky 1990; Garner & Garfinkel 1981) that can be influenced by the self, interactions with others, and societal messages. Whereas weight-related stigma is rampant in Western society, adolescents with overweight and obesity are prone to discrimination by others. This discrimination often occurs in the form of weight-based teasing that is perpetrated by parents, peers, and other adults, contributing to feelings of shame regarding their appearance. Because body image is influenced by external factors, such as the way we believe others perceive our body, this frequent negative feedback may contribute to the development of body dissatisfaction. I therefore believe that it would be most valuable to situate body esteem within an interpersonal framework to examine how negative peer and parent interactions experienced by youth with obesity contribute to the development of body dissatisfaction. I first review existing literature on interpersonal theory and how it relates to psychopathology. I then review attachment theory, one of the major variants of interpersonal theory.

### **Interpersonal Theory**

The interpersonal view of psychopathology was first developed as an alternative approach to the diagnosis and treatment of mental illness. In stark contrast to Kraepelin's (1919; 1971) medical view of psychiatry and the psychoanalytic theory of Freud (1915-1916/ 1963), early interpersonal theorists began viewing mental illness as a social phenomenon, resulting in part from one's environment. For instance, Durkheim

(1897/1951) concluded that social alienation (or anomie) placed some groups at higher risk for suicide than others. Cooley's (1902/1983) theory of social subjectivity and the "looking glass self" postulated that self-image consists of reflections from one's social environment and how one believes others view oneself, and Mead (1913) believed that individuals are a direct product of their social environment.

Many contemporary interpersonal theorists view disturbances in interpersonal relations as antecedents to various types of psychopathology. Drawing upon psychoanalytic theory, interpersonal theory focuses on the individual's childhood experiences and family relationships as antecedents to specific mental illness, where interpersonal disturbances in childhood predispose children to adult manifestations of mental illness (Klerman, Rounsaville, & Chevron, 1994). Thus, treatment grounded in interpersonal theory differs from other psychological approaches because it emphasizes the interpersonal context surrounding personality traits and mental health issues, viewing the individual as a social being whose interactions with others impact psychosocial functioning, rather than focusing primarily on intrapsychic phenomena within the individual (Lipsitz & Markowitz, 2016).

The early work of interpersonal theorists has gone on to inform current treatment strategies for various types of psychopathology in adolescents and adults. One such strategy is Interpersonal Psychotherapy (IPT), which was initially developed to treat unipolar depression in adults, but has since proven useful for overweight adolescents experiencing symptoms of eating disorders (Tanofsky-Kraff, Shomaker, Young & Wifley, 2015), which often result from body image disturbances. IPT operates on the premise that interpersonal experiences precipitate psychopathology, and conversely,

psychopathology may result in impairments in one's ability to interact effectively with others (Klerman Weissman, Rounsaville, & Chevron 1984). This results in a bi-directional relation between mental illness and the impaired ability to effectively interact with others. Thus, IPT emphasizes the importance of interpersonal functioning as a key component of psychological adjustment and wellbeing and assumes that the development, maintenance, and treatment of psychiatric symptoms occur within influential social and interpersonal contexts (Klerman et al., 1984).

### **Attachment Theory**

Attachment theory is based on the early work of John Bowlby (1958) and Mary Ainsworth (Ainsworth & Bowlby, 1991). Attachment theory posits that humans are born with an innate need to form an attachment bond to their caregiver. The attachment system functions to keep infants within close physical proximity of their caregiver during times of perceived threat or distress (Bowlby, 1969/1982, 1973, 1980, 1988). Although infants' communication strategies are relatively limited (e.g. sucking, crying, and clinging), these behavioral cues quickly mature during the first six months of life and become a way for infants to communicate their needs to a caregiver.

As the child develops and is able to explore its surroundings, the mother becomes a secure base to which the child can quickly return for comfort and security (Ainsworth, 1970). The responsiveness of the caregiver to the infants' behavioral cues during these early interactions is important as the infant uses these responses to develop an internal working model of themselves and their caregiver that remains salient. For instance, if the caregiver consistently acknowledges and tends to the infant's need for comfort and protection, the infant will view itself as competent and worthy of love. In contrast, if the

caregiver has frequently been unresponsive or rejecting of the infant's needs for comfort, the infant will view itself as incompetent and unworthy of love. Thus, the resulting attachment bond will be secure if the caregiver responds to the infant's distress cues in a consistent manner, or insecure if the caregiver is often unresponsive or unavailable (Bowlby, 1970).

During middle to late childhood, children become more autonomous and begin to spend more time away from their caregivers. As children mature, the attachment system remains stable and resembles that of early infancy, but is uniquely influenced by the physical and behavioural changes associated with the onset of puberty, differing parental expectations regarding this stage of development, and advances in critical thinking (Kobak & Cole 1994; Richardson, 2005). Though parents are still utilized for some attachment needs (i.e. safety), adolescents turn instead to peers for companionship and emotional support (Hazan & Zeifman, 1994; Lippincott & Deutsch, 2005; Nickerson & Nagle, 2005). Research shows that attachment remains fairly stable across the lifespan (e.g. Waters, Merrick, Treboux, Crowell, & Albersheim, 2000), especially if the caregiver remains consistently available during childhood and there is a relatively low occurrence of stressful life events (Waters, Treboux, Crowell, & Albersheim, 2000).

It is thought that the caregiver-child bond formed during early childhood remains salient and acts as a prototype for future interpersonal relationships (e.g., peers, romantic partners; Allen, 2008; Hazan & Shaver, 1987). Adult and adolescent attachment styles are typically conceptualized based on self-image and image of others, resulting in four attachment categories; secure (views self and others positively), preoccupied/anxious (negative self-view, positive other view), dismissing/avoidant (positive self-view,

negative other view) and fearful (negative self-view, negative other view; Bartholomew & Horowitz, 1991). The latter three can be categorized together as ‘insecure’ attachment styles. Those who are securely attached are comfortable with intimacy and easily turn to others for support. Preoccupied (or anxious) individuals excessively seek intimacy while fearing rejection and abandonment. Dismissing (or avoidant) individuals avoid close relationships and value independence and self-reliance. Finally, fearful individuals want close relationships and approval, but avoid intimacy due to fear of rejection (Bartholomew & Horowitz, 1991).

In line with this, research suggests that the nature of one’s attachment to parents often correlates with the quality of peer relations an adolescent can expect to experience (Benson, Mcwey, & Ross, 2006). For instance, adolescents with a secure attachment have been shown to easily form new relationships that are characterized by a combination of autonomy and relatedness (Crowell, Fraley, & Shaver, 2002). In addition, they are more sociable, less hostile, more adaptive, and open to exploring new activities and experiences which translates into greater competence with peers (Erikson, Sroufe, & Egeland, 1985; Kerns, Klepac, & Cole, 1996). In contrast, adolescents with an insecure attachment experience cognitive distortions related to new relationships which can lead to distorted communications, problematic functioning, and negative expectations regarding the behaviors of others (Cassidy, Kirsh, Scolton, & Parke, 1996; Dodge, 1993). Thus, those securely attached may find it easier to form peer relationships than those insecurely attached. Given the importance of peer relationships during adolescence, those insecurely attached may be at risk for negative psychosocial outcomes.

In addition to influencing interpersonal relationships, attachment style is also thought to influence personality development, self-evaluation, and emotion regulation (Mikulincer, Shaver, & Pereg 2003; Mikulincer, 1998; Pipp, Easterbrooks, & Harmon, 1992; Sroufe, Carlson, Levy, & Egeland, 1999). For instance, research has shown that early attachment insecurity in girls is associated with higher emotional sensitivity during adolescence compared to those securely attached (Murray, Halligan, Adams, Patterson, & Goodyer, 2006). This sensitivity may make insecurely attached adolescents especially vulnerable to negative interpersonal interactions and increase risk of negative psychosocial outcomes compared to those securely attached.

Given the significant body of research that uses an attachment based framework to examine individual differences in interpersonal functioning, emotional regulation, and coping, I believe that situating body esteem in an attachment-based framework will be useful in examining individual differences in body esteem in an attempt to gain insight into the emotional resiliency of youth with overweight and obesity.

### **Stigma and Weight Teasing**

Early theorists, such as Erving Goffman (1963), describe stigma as possessing an attribute that discredits any individual possessing it, thereby “spoiling” their identity. Stigmatized individuals are thereby considered social deviants who are subsequently rejected, discriminated against, or avoided altogether.

A significant body of research suggests that obesity is heavily stigmatized in Western society. Many studies have demonstrated that attitudes toward youth with obesity are overwhelmingly negative. In one study, children were shown silhouettes of bodies that represented extreme endomorph (high body fat), ectomorph (lean and tall)

and mesomorph (muscular) body types and were asked to assign a list of adjectives to each body type. Children generally assigned favorable adjectives to the mesomorph (muscular) silhouette, but assigned unfavorable and socially aggressive adjectives to the endomorph silhouette (i.e. lazy, dirty, stupid, mean and lying; Staffieri, 1967). In a similar study, children aged 10-11 were presented with six drawings of children. Four of the drawings depicted children with obvious physical disabilities (e.g. a child with one hand missing, a child with a facial disfigurement), one depicted an obese child, and one depicted a child with no visible disability. Children were then asked to rate drawings of children according to how well they liked them. The photo of the obese child was consistently ranked last (i.e. least likeable) across all sets of subjects (Richardson, Goodman, Hastorf & Dornbusch, 1961). Interestingly, this aversion toward the obese child held true for children across a variety of socioeconomic backgrounds, races, and even for children who themselves were physically disabled. In 2003, Latner and Stunkard replicated Richardson and colleagues' 1961 study to examine how attitudes toward children with obesity would compare to those from 40 years prior. Children in both the 1961 and 2003 study ranked the obese child last; however, children in the 2003 study liked the obese child significantly less than in 1961. These authors concluded that stigmatization of obese and overweight children begins at a young age and is worsening over time.

One potential explanation for the increasing stigma associated with obesity is the oversimplification of the problem (i.e. "they could lose weight if they tried harder") as well as the idea that those with obesity are personally responsible and thus should be blamed for their condition. Past research suggests that people view obesity not as a

physical stigma, but a characterological stigma that is perpetuated by the individual's laziness, self-indulgence, and lack of self-control (Dejong, 1980; Maddox & Liederman, 1969). Indeed, those who possess a characterological stigma, or what early theorists referred to as "blemishes of character" (Goffman, 1963), are believed to be responsible for acquiring their deviant status. On the other hand, those with physical stigma are not viewed in the same negative light as physical deformities are believed to be acquired by external factors, such as genetics or illness, and are viewed as out of one's control (i.e. Dejong, 1980; Wright, 1960). The stigma associated with overweight and obesity is extremely problematic, as research has shown that stigma and blaming does not facilitate behavior change. Rather, weight bias and stigma actually increase morbidity, mortality, and social inequities (Goldberg & Puhl, 2013; Hatzenbuehler, Phelan & Link, 2013).

Youth with overweight and obesity face discrimination in many areas of their lives. This includes weight-bias and stereotyping by peers, educators and even parents (see Puhl & Latner, 2007 for a review). For instance, children with obesity often experience high levels of social exclusion, and attribute their weight as the reason for this exclusion and for having few friends (Kimm & Obarzanek, 2002; Pierce & Wardle, 1997). In addition, overweight young people rate their school performance and educational potential lower than their non-overweight peers (Davison & Birch, 2001; Mellin, Neumark-Sztainer, Story, Ireland, & Resnick, 2002). Some researchers suggest that attributes of teachers may play a role in poor academic achievement as one study found that the more overweight a girl was, the less intellectually capable her teacher rated her (Smith & Niemi, 2003).

One form of weight-bias and discrimination to which youth with obesity are frequently subjected is weight-based teasing. Though the effects of harmful interpersonal interactions, such as bullying and teasing, have been widely studied in an adolescent context, less attention has been focused on specific types of teasing, such as weight-based teasing. Although it seems that adolescents of all body types, including average weight and underweight adolescents, are subjected to weight-based teasing at one time or another (Neumark-Sztainer et al., 2002; Puhl & Luedicke, 2011), those who are overweight and obese experience it more far more frequently (Goldfield et al., 2010b; Puhl & Latner, 2007; Neumark-Sztainer et al., 2002a). In fact, one US study found that 89.1% of overweight and obese children aged 10-14 reported being teased about their weight, compared to 31.3% of non-overweight children. They also rated the teasing as more upsetting, and reported that the teasing lasted for longer durations compared to normal weight children (Hayden-Wade et al., 2005). These statistics are cause for concern given that appearance related teasing has been found to be detrimental to the development of body image and may have long-term consequences for the development of self-concept and interpersonal relationships (Davison & Birch 2002; Eisenberg, Neumark-Sztainer, & Story, 2003).

Experiencing appearance-related stigma can undoubtedly lead to negative self-evaluations. In addition to body dissatisfaction, past research has shown that weight-based teasing is associated with a host of other negative psychosocial outcomes including negative and depressed mood, anxiety, low self-esteem, and avoidant coping strategies such as increased food consumption, emotional eating, and binge eating (Eisenberg et al., 2003; Goldfield et al., 2010b; Puhl & Luedicke, 2011). Other studies found that

overweight youth who have experienced weight teasing are more likely to avoid engaging in physical activity (Faith, Leone, Ayers, Heo & Pietrobelli, 2002; Storch et al., 2007). Another study found that adolescents who are teased about their weight (regardless of their actual weight) perceive themselves as being less physically capable and less competent in their physical abilities than adolescents who did not experience teasing (Greenleaf, Petrie & Martin, 2014). These findings are problematic because binge eating, emotional eating and avoidance of exercise could contribute to further weight gain and further vulnerability to weight teasing, creating a vicious cycle.

Although weight stigma and discrimination, in the form of weight teasing, is experienced by the vast majority of those with overweight and obesity, there are differences in how individuals' manage this stigma, and not all individuals with obesity develop body image disturbances and psychopathology. In line with this, some researchers have shown that adolescents with obesity are at no greater risk for developing general psychopathology than their normal weight peers (Lamertz, Jacobi, Yassouridis, Arnold, & Henkel, 2002), and are able to maintain a positive self-image despite negative perceptions from others (Wills, Backett-Milburn, Gregory, & Lawton, 2006). Therefore, studying obesity and mental health from a strictly psychopathological perspective contributes to the further victimization of youth with obesity and detracts from the idea that this population can thrive in a psychological sense (Lamertz et al., 2002; Wills et al., 2006). Given the prevalence of weight stigma and discrimination in today's society, adolescents with overweight and obesity who display a positive self-image (i.e. positive body esteem) would be considered resilient. Since the concept of psychological resiliency in adolescents with overweight and obesity has not been extensively covered in the

literature to date, it is therefore important for future research to examine this concept by identifying individual factors that buffer the effects of weight teasing and prevent body dissatisfaction.

### **Protective Factors**

Consistent with interpersonal theory that states the development, maintenance, and treatment of psychiatric or psychosocial symptoms occur within influential social and interpersonal contexts (Tanofsky-Kraff et al., 2015), I believe factors that may buffer the negative impact of weight teasing will be those that exist within this social and interpersonal context. Therefore, I propose attachment style and social support as potential protective factors.

### **Attachment Style**

Attachment style has become an important framework for understanding adult and adolescent mental health (Dozier, Stovall-McClough, & Albus, 2008). Past research has found secure attachment to be consistently associated with better mental and physical functioning across a wide variety of people, including those who are healthy, chronically ill, and obese (Hunter & Maunder, 2001; Kotler, Buzwell, Romeo, & Bowland, 1994; Martin, Vosvick & Riggs, 2012; Sockalingam, Wnuk, Strimas, Hawa, & Okrainec, 2011).

Attachment style is also widely used to examine body esteem in both adolescents and adults. Many studies suggest that attachment style independently predicts body esteem, as both men and women with a secure attachment style tend to report higher body esteem than those with an anxious/preoccupied attachment style (Cash et al., 2004; Frederick, Sandhu, Morse, & Swami, 2016). Moreover, a large body of research has

shown the majority of those with clinical diagnoses of eating disorders are insecurely attached (Broberg, Hjalmer, & Nevonen, 2001; Cash, et al., 2004; Crowell et al., 1999; Hesse, 1999; Salzman, 1997; Tasca & Balfour, 2014; Zachrisson & Skårderud, 2010). Though insecure attachment encompasses both anxious and avoidant attachment styles, some research suggests that attachment anxiety is positively associated with body dissatisfaction, whereas attachment avoidance is not (Abbate-Daga et al., 2010; Bartholomew & Horowitz, 1991; Cash, Theriault, & Annis, 2004; McKinley & Randa, 2005), though these results are mixed (Tasca et al., 2009). Despite these findings, few studies have assessed the specific mechanisms by which attachment style may affect body esteem (Tasca & Balfour, 2014). Moreover, much of the research in this domain has been conducted on clinical samples of adults with eating disorders, so it is unclear if the same patterns will be found in community samples of adolescents.

In regards to mechanisms by which attachment may affect body esteem, some researchers argue that certain aspects of secure attachment may protect individuals against the development of body dissatisfaction, whereas aspects of attachment anxiety may confer risk for developing body dissatisfaction. For instance, those with a secure attachment display higher levels of identity development (Berman, Weems, Rodriguez, & Zamora, 2006), have a greater understanding of themselves and who they are, and have a more positive self-concept (e.g. Ben-Zur, 2003). Therefore, those with a secure attachment may be less inclined to derive perceptions of their body from external sources and be more comfortable with who they are. On the other hand, those with an insecure attachment tend to have a more negative, less stable and more externally dependent self-view (Goodvin, Meyer, Thompson, & Hayes, 2008; Srivastava & Beer, 2005). Indeed, a

strong need for approval from others- an aspect of attachment anxiety- has been positively linked to body dissatisfaction and eating disorder psychopathology in adult clinical samples independent of personality dimensions, demographics, eating disorder diagnosis, and depression (Abbate-Daga et al., 2010; Amianto, Abbate-Daga, Morando, Sobrero & Fassino, 2011; Illing, Tasca, Balfour & Bissada, 2010; Troisi et al., 2006). Other aspects of attachment anxiety, such as maladaptive perfectionism, proximity seeking, and abandonment fears have also been linked to body dissatisfaction (Abbate-Daga et al., 2010; Dakanalis et al., 2014; Eggert, Levendosky, & Klump, 2007).

Secure attachment may also indirectly influence body image by better equipping individuals to deal with the effects of weight teasing. Past research suggests that those with secure attachment styles have a more realistic view of stressors, as well as their own resilience when faced with adversity (Ciechanowski & Katon, 2006). They also tend to respond with more adaptive resolutions to difficult situations given their ability to effectively self-regulate affect and behavior, and are thus more resilient (Sroufe, 1983). Indeed, self-regulation has been identified as an important trait in regards to body esteem as difficulty with affect regulation has been suggested as a possible mechanism by which attachment confers risk for body dissatisfaction and eating disorders. Indeed, hyper-activation of emotions- a characteristic of anxious attachment- was found to mediate the relation between anxious attachment and eating disorder symptoms in an adult clinical sample (Tasca et al., 2009). Other research suggests that those with an insecure attachment are more emotionally sensitive than those securely attached (Murray et al., 2006). Thus, adolescents who are securely attached may be more resilient to the effects of

weight teasing compared to their insecurely attached peers, resulting in little to no change in body esteem as a result of the teasing.

### **Social Support**

Social support is essential for healthy adolescent development, as it may contribute to feelings of self-worth, self-efficacy, positive affect, stability as well as emotional support and security (Cohen & Willis, 1985; Postigo, Gonzalez, Montoya, & Ordoñez, 2013; Schutz & Paxton, 2007). In addition to these benefits, research suggests that social support may also protect individuals from the negative effects of adverse life events (Cohen & Willis, 1985). In line with this, research has demonstrated that social support from peers or parents helped buffer the negative effects of peer victimization on adolescents' mental health outcomes such as depression, loneliness, externalizing and internalizing symptoms (Boivin, Hymel, & Hodges 2001; Bowes, Maughan, Caspi, Moffitt & Arseneault, 2010; Cooley, Fite, Rubens, & Tunno, 2015; Prinstein, Boergers, & Vernberg, 2001; Stadler, Feifel, Rohrman, Vermeiren, & Poustka, 2010; Storch & Masia-Warner, 2004).

Other research suggests that social support may attenuate body image concerns in adolescent girls by fostering resilience against sociocultural pressures (Stice, Presnell, & Spangler, 2002). For instance, Stice, Spangler, and Agras (2001) assessed the long-term effects of thin-ideal media exposure on body dissatisfaction and disordered eating in adolescent girls. Girls were assigned either to a condition where they received a subscription to a fashion magazine for 15 months, or to a no subscription condition. At a 20-month follow up, they found no differences between the groups on any of the outcomes. However, girls who received the fashion magazine and had initially reported

lower levels of social support showed an increase in body dissatisfaction, dieting, and bulimic symptoms at the 20-month follow-up evaluation. Another study found that social engagement moderated the relation between weight status and body image for girls, where overweight and obese girls with less social engagement had higher levels of body dissatisfaction than overweight and obese girls with greater social engagement. There was no such relation found for boys. However, social engagement was associated with more body satisfaction in boys, regardless of their weight status (Caccavale, Farhat, & Iannotti, 2012).

In addition to the findings reported by Stice et al., (2001) and Caccavale et al., (2012), two other longitudinal studies suggest that positive family relationships including spending more time with parents, perceiving one's parents as friendly, and feeling closer to parents is associated with lower levels of body dissatisfaction and disordered eating (Byely, Archibald, Graber & Brooks-Gunn, 2000; Swarr & Richards, 1996). Relatedly, studies show that lack of peer support is associated with higher body image concerns among adolescent girls (Alta, Ludden, & Lally, 2007; Stice & Whitenton, 2002), and conflict ridden, negative parent-adolescent relationships are associated with body image concerns, dieting, and eating problems in adolescent girls (Archibald, Graber, & Brooks-Gunn, 1999; Hanna & Bond, 2005; Leon, Fulkerson, Perry & Dube, 1994). The results of these studies taken together suggest that sociocultural influences, including weight bias, are not as impactful on adolescents' emotional health who have a social support network, either from parents and/or peers that value them.

### **Present study**

Rates of childhood obesity have increased dramatically in the past 25 years (Shields, 2005), and although most efforts to reverse this trend have focused on reducing BMI, little has been done to address the negative impact weight stigma and discrimination have on adolescent mental health. A significant body of research indicates that attitudes toward youth with obesity are overwhelmingly negative (e.g. Dejong, 1980; Puhl & Latner, 2007; Richardson et al., 1961; Staffieri, 1967), and are worsening over time (Latner & Stunkard, 2003). Unfortunately, this appearance-related stigma makes youth particularly vulnerable to harmful interpersonal interactions, such as weight teasing, by peers, parents, and even other adults (e.g. Goldfield et al., 2010b). As such, it is unsurprising that body dissatisfaction is a reliable psychosocial correlate of obesity in youth (Friedman & Brownell, 2002).

Though links between obesity and psychopathology have been identified in the literature, this negative focus distracts from the idea that youth with obesity can thrive, despite their weight status and the associated stigma (Lamertz et al., 2002; Wills et al., 2006). Indeed, prospective and longitudinal research has shown that positive body esteem attenuates weight gain and disordered eating in adolescents with overweight and obesity (Haines et al., 2007; Loth et al., 2015; Neumark-Sztainer et. al., 2006b; Sonnevile et al., 2012; van den Berg & Neumark-Sztainer, 2007), suggesting that positive body esteem may be important to the mental and physical wellbeing of adolescents with overweight and obesity. Thus, future research should seek to examine the resiliency of youth with overweight and obesity in an attempt to understand how these youth manage appearance-

related stigma and maintain a positive body image despite the discrimination they face (Russell-Mayhew, McVey, Bardick, & Ireland, 2012).

Since body esteem is multidimensional and encompasses thoughts about how others view our bodies, I believed it would be useful to situate body esteem within an interpersonal framework to examine the relation between body esteem and weight teasing in youth with obesity. In doing so, I aimed to identify protective factors that buffer against the development of body dissatisfaction in youth with obesity. As previous research has suggested that attachment style and social support may influence body esteem, I tested these relations in adolescents with overweight and obesity. Specifically, I examined how secure attachment and social support may buffer the negative effects of weight teasing on body esteem over time.

### **Objectives and Hypotheses**

**Objective 1:** To determine the longitudinal relation between weight teasing and body esteem.

**Hypothesis 1:** There will be a negative relation between weight teasing and body esteem such that greater teasing predicts lower body esteem.

**Objective 2:** To determine the extent to which attachment style and social support moderate the relation between weight teasing and body esteem over time.

**Hypothesis 2:** The relation between weight teasing and body esteem will vary as a function of attachment style and social support.

**Hypothesis 2a:** Among those with an insecure attachment style, the relation of teasing to body esteem will be strong and negative; however, among those with a secure attachment style, teasing will be less strongly associated with lower body esteem.

*Hypothesis 2b:* Among those with low social support, the relation of teasing to body esteem will be strong and negative; however, among those with high social support, teasing will be less strongly associated with lower body esteem.

## **Method**

### **Participants**

Overweight and obese participants were drawn from a large community-based longitudinal research study- the Research on Eating and Adolescent Lifestyles (REAL) study. Participants consisted of two cohorts of students in grades 7 and 9 from the Ottawa, Ontario region, who were followed-up with annually. The analytic sample in the present study consisted of N= 277 participants at baseline (T1; 54% female) classified as overweight and obese (78% overweight), as categorized by BMI percentile cutoffs (BMI  $\geq 85^{\text{th}}$  -  $< 95^{\text{th}}$  for overweight, and BMI  $\geq 95^{\text{th}}$  for obese based on age and sex-adjusted population growth charts).

Participants were included in the study only if they were classified as overweight or obese at the time of assessment. It should be noted that a small number of participants reported fluctuations in weight status over time (i.e. they were either overweight at some time points, but normal weight at others). Since the purpose of the study is to examine the relation between weight teasing and body image in those with overweight or obesity, participants were not included in the analytical sample at the time points in which he or she was normal weight. In total, 20 participants changed weight status in this manner during the course of the study. To determine whether including these participants only at time points in which they are overweight (and not time points where they were normal weight) would have undue influence on the results obtained, correlations and t-tests were

conducted with the 20 participants included and excluded on key variables. The results of these analyses showed minimal differences with these participants included vs. excluded. Thus, these participants were retained only at time points in which they were classified as overweight for all subsequent analyses.

Participants were on average 13.42 years of age at the first assessment (baseline T1;  $SD = 1.09$ ), 14.22 at the second assessment ( $SD = 1.03$ ), 15.47 at the third assessment ( $SD = 1.10$ ) and 16.46 at the fourth assessment ( $SD = 1.07$ ), respectively. The number of participants varied at each time point ( $N = 277$  at T1, 144 at T2, 64 at T3, and 37 at T4). The data from assessment T5 and onward were not used due to low rates of participation (Blozis & Cho, 2008; Gunnell et al., 2016). Given the substantial attrition, a missing values analysis (MVA) was conducted. The results of the MVA suggested that the data are missing completely at random (MCAR; Little's MCAR test  $p = .19$ ). In addition to the MVA, a number of t-tests were conducted that compared the mean of participants who participated at each time point to those who did not on key variables. The t-tests indicated that those who participated at T2 did not significantly differ from those who did not on any variables of interest. Those who participated at T3 reported significantly lower weight esteem compared to those who did not participate. Finally, those who participated at T4 reported significantly higher peer teasing than those who did not participate. Details of the MVA and the t-tests are presented in Appendix D.

### **Procedure**

Data were originally collected as part of a large community-based research study—the Research on Eating and Adolescent Lifestyles (REAL) study. The goal of the REAL study was to employ a prospective, longitudinal design to examine the psychological,

behavioral, biological and environmental risk factors associated with eating and weight-related disorders (i.e. eating disorders and obesity) in adolescence.

Three public school boards in the Ottawa, Ontario region (the Ottawa Catholic School Board, the Ottawa-Carleton District School Board and the Upper Canada District School Board) and several private schools were invited to participate in the study, and 31 public and 2 private schools agreed to participate. Depending on feasibility, each participating school allowed recruitment in one or several classrooms. Research staff first visited each participating classroom to present the study, answer questions, and distribute consent forms. Incentives (i.e. movie gift certificates or a pizza party for classrooms with at least a 70% consent rate) were offered to increase student participation in the study. Research staff then visited classrooms a second time to administer the measures to consenting participants and oversee survey completion. The measures consisted of self-report questionnaires in paper in pencil format that were administered during class time and took approximately 1 hour to complete. In addition to these questionnaires, research staff also obtained objective measures of height and weight in a private area. Height measurements were taken using a HM200P Portable Stadiometer (Quick Medical Equipment and Supplies, U.S.A) and were recorded in centimeters to the nearest 0.1 cm. Weight was measured using a UC-321 Digital Weighing Scale (Quick Medical Equipment and Supplies, U.S.A.), and was recorded in kilograms to the nearest 0.1 kg.

Students in grades seven and nine at the time of initial data collection were oversampled for the purpose of inclusion in the longitudinal study. These groups were selected as they reflected key developmental periods- early and late adolescence. Thus, as the study progressed, researchers would be able to examine variables of interest across all

stages of adolescent development- starting in early adolescence and ending in early adulthood. These two cohorts of students (i.e. those in grades seven and nine) from the baseline study were invited to participate in the longitudinal study and asked for consent to be re-contacted for a follow-up.

Each subsequent wave of follow-up data collection was conducted annually (within three months of the anniversary date of baseline assessment). Data collection occurred in the same manner as the baseline assessment, except for cases where students who had consented to follow-up were absent the day of data collection. In these circumstances, participants were contacted by telephone and asked to complete measures at their convenience at the Institute of Mental Health Research – Youth Research Unit. Participants who completed measures in this manner were reimbursed for transportation or parking fees and compensated \$20. Participants who completed measures in the classroom setting were entered into a lottery to win a gift worth \$20 or received a classroom pizza party as incentive to participate.

## **Measures**

**Demographics.** Demographic information was collected as part of the original study. Age, gender, BMI and SES (parents highest level of completed education as proxy) were used as covariates in the analyses.

**Weight Status.** Body Mass Index (BMI) is one of the most commonly used measures to estimate body composition in children and adolescents as it can be calculated quickly without need for specialized equipment. BMI was calculated by dividing each participant's objectively measured weight in kilograms by their respective heights in metres squared ( $BMI = kg/m^2$ ). BMI percentiles were then calculated based on growth

charts from the U.S. Center for Disease Control and Prevention (Kuczmarski et al., 2002), and were then used to classify participants into weight categories based on the Center for Disease Control guidelines (Barlow & Dietz, 1998; Kuczmarski et al., 2002, 2007). Those with a BMI  $\geq$  85<sup>th</sup> - < 95<sup>th</sup> percentile were classified as overweight, and those with a BMI  $\geq$  95<sup>th</sup> percentile were classified as obese.

**Body esteem.** The Body Esteem Scale for Adolescents and Adults (BESAA; Mendelson, Mendelson, & White, 2001) is a 23-item measure that was used to assess participant's attitudes and feelings about their bodies and physical appearance (see Appendix A). Two subscales of the BESAA were used: Appearance Esteem, which encompasses general feelings about appearance (10 items, e.g. "I like what I see when I look in the mirror") and Weight Esteem, which examines satisfaction with weight (8 items, e.g. "I am satisfied with my weight"). Participants were asked to rate how often they agreed with the following statements about themselves on a 5-point Likert scale from 0 (never) to 4 (always). Individual subscale scores were obtained by taking the mean score across items of each subscale, with higher scores indicating more positive body esteem on a particular subscale.

The BESAA is valid and reliable in individuals ranging in age from 12 to 25 years (Mendelson et al., 2001). Cronbach's alpha for the Appearance Esteem and Weight Esteem subscales were .87 and .88 respectively in the baseline sample, which is similar to what has been reported in past research (Mendelson et al., 2001).

**Weight teasing.** Weight teasing was assessed using two subscales of the McKnight Risk Factor Survey IV (MRFS-IV; McKnight Investigators, 2003; Shisslak et al., 1999). The subscales used to assess the prevalence and effect of weight-based teasing

in the proposed study are: Peer Teasing (8 items, e.g. “have girls/young women made fun of you because of your weight?”), and Parent Teasing (2 items, e.g. “has your father made a comment to you about your weight or your eating that made you feel bad?”; see Appendix B). Participants rated each item using a 5-point Likert scale ranging from 1 (never) to 5 (always). Some items in each subscale ranged from 0 (I have not been teased/I do not have a mother or father figure) to 5 (always). Scores for each subscale are obtained by taking the mean score across items of each subscale, with higher scores indicating more weight-based teasing on a particular subscale.

The Peer Teasing subscale in the baseline sample (T1) demonstrated good reliability ( $\alpha = .89$ ), but was lower for the Parent Teasing subscale ( $\alpha = .53$ ). Both subscales of weight-based teasing have shown good test-retest reliability after one week in a sample of adolescent girls, with coefficients ranging from .63 to .81 (Shisslak et al., 1999). In prior research, the internal consistency for the Peer Teasing subscale was demonstrated to be good ( $\alpha = .79$  to  $.91$ ), but was adequate for the Parent/Other Adult Teasing subscale ( $\alpha = .67$  for middle school and  $\alpha = .43$  for high school students, respectively; Shisslak et al., 1999).

**Social Support.** Social support was assessed using the Support/Sharing subscale of the McKnight Risk Factor Survey IV (MRFS-IV; McKnight Investigators, 2003; Shisslak et al., 1999; See Appendix B). The Support/Sharing subscale contains three items that assess the participant’s general perception of social support (e.g. “have you had someone you can count on to listen to you when you need to talk?”). Participants rated each item using a 5-point Likert scale ranging from 1 (never) to 5 (always). Participant’s scores were obtained by taking the mean across items in the subscale, with higher scores

indicating greater social support. The Support/Sharing subscale in the cross-sectional sample demonstrated good reliability (Cronbach's alpha = .82), which is consistent with prior research using a sample of adolescent girls (McKnight Investigators, 2003).

**Attachment.** The Adolescent Relationship Questionnaire (ARQ; Bartholomew & Horowitz, 1991) was used to assess attachment (See Appendix C). The ARQ is a 5-item measure, revised from the original Relationship Questionnaire (RSQ) for adults, that is widely used to assess global attachment in youth and adults (e.g. D'Argenio et al., 2009; Karavasilis et al., 2003; Lanciano, Curci, Kafetsios, Elia, & Zammuner, 2012). The ARQ has demonstrated good reliability, validity, and psychometric properties in samples of young adults (Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994; Scharfe & Bartholomew, 1994).

The first four items consist of short paragraphs describing each attachment style where: A represents secure, B represents fearful, C represents preoccupied, and D represents dismissing. Participants were asked to rate each item on a 7-point Likert scale: 1 (not at all like me) to 7 (very much like me). The final item is a forced-choice question, where participants are asked to choose the attachment style description that most closely resembles them (i.e. either A, B, C, or D).

The ARQ was scored using a categorical approach. When computing the categorical score, participants were categorized dichotomously as either securely attached or insecurely attached (where insecure = fearful, preoccupied, or dismissing) based on the attachment prototype they rated the highest (i.e. the most like them). Participants were considered securely attached if they circled option A (secure) on the forced choice portion of the ARQ (Appendix C), and were considered insecurely attached if they chose

either option B (fearful), C (preoccupied), or D (dismissing). If the forced choice question was skipped, the Likert questions were then be used to determine attachment style by categorizing the participant into the attachment style they scored the highest on (i.e. if they scored highest on Likert question A, then they were considered securely attached, and if they scored highest on Likert questions B, C, or D, they were considered insecurely attached). In the event of a tie between a secure and insecure Likert score, that participant was categorized as insecure.

## **Results**

### **Preliminary Analyses**

Prior to testing any hypotheses, I calculated descriptive statistics for all variables to describe the sample (see Table 1).

Table 1

*Means and SDs for covariates, predictor and outcome variables*

Time point	Mean (SD)			
	T1	T2	T3	T4
N	277	144	64	37
Attachment	.66 (.41)	.76 (.42)	.73 (.44)	.70 (.46)
Gender	.46 (.49)	.46 (.50)	.38 (.48)	.41 (.49)
SES	2.44 (.75)	2.61 (.70)	2.56 (.73)	2.49 (.69)
BMI	4.22 (.41)	4.27 (.44)	4.20 (.40)	4.27 (.45)
Weight Esteem	3.40 (.89)	3.26 (.93)	3.21 (.95)	3.16 (.88)
Appear. Esteem	3.36 (.81)	3.44 (.84)	3.40 (.83)	3.45 (.67)
Social Support	3.83 (1.00)	4.04 (.97)	3.92 (.96)	4.05 (.80)
Peer Teasing	1.61 (.82)	1.59 (.81)	1.73 (.87)	1.77 (.76)
Parent Teasing	1.46 (.77)	1.46 (.83)	1.66 (.86)	1.51 (.74)
All Teasing	3.06 (1.34)	3.06 (1.44)	3.37 (1.51)	3.28 (1.27)

*Note:* Attachment (0 = insecure, 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese), SES (1 = neither parent college educated, 2 = one parent college educated, 3 = both parents college educated).

I also calculated the number of participants in each category for all categorical variables (see Table 2).

Table 2

*N (%) in each category for all categorical variables at each time point*

	T1	T2	T3	T4
<b>Attachment</b>				
Secure	171 (66.5%)	108 (76%)	47 (73%)	26 (70%)
Insecure	86 (33.5%)	34 (24%)	17 (27%)	11 (30%)
<b>Gender</b>				
Male	127 (46%)	66 (46%)	24 (37.5%)	15 (40.5%)
Female	150 (54%)	78 (54%)	40 (62.5%)	22 (59.5%)
<b>BMI</b>				
Overweight	216 (78%)	105 (73%)	51 (80%)	27 (73%)
Obese	61 (22%)	39 (27%)	13 (20%)	10 (27%)
<b>SES</b>				
Neither parent college	85 (31%)	32 (22%)	9 (14%)	6 (16%)
One parent College	56 (20%)	36 (25%)	10 (16%)	6 (16%)
Both parents college	136 (49%)	76 (53%)	44 (70%)	25 (68%)

*Note:* Attachment (0 = insecure, 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese), SES (1 = neither parent college educated, 2 = one parent college educated, 3 = both parents college educated).

The frequency for each teasing variable was calculated to determine the proportion of the sample experienced at least some teasing (teasing mean  $\geq 1.01$ ) vs. no teasing at all (teasing mean  $\leq 1$ ). Analyses of T1 showed that 69% reported experiencing at least some peer teasing, and 43% reported experiencing at least some parent teasing.

An 'all teasing' variable was also calculated by summing the teasing scores for both peers

and parents with the purpose of examining the combined effect of teasing from both sources on body esteem.

Next, correlations were computed for all covariates, predictor, and outcome variables at T1. As shown in Table 3, parent, peer and all teasing were negatively correlated with both weight and appearance esteem. Peer teasing was more strongly and negatively correlated with both appearance and weight esteem compared to parent teasing and all teasing. Attachment was negatively correlated with all types of teasing (parent, peer, all) and positively correlated with weight and appearance esteem. Social support was positively correlated with both weight and appearance esteem. All correlations were in the expected directions.

Table 3

*Correlation matrix of covariates, predictor and outcome variables at T1 (N = 277).*

	1	2	3	4	5	6	7	8	9	10	11
1. Attachment	-										
2. Gender	.07	-									
3. SES	.13*	.18**	-								
4. BMI	-.06	.07	-.03	-							
5. Age	-.11	-.13*	-.04	-.01	-						
6. Weight Esteem	.39**	.37*	.13*	-.22**	-.10	-					
7. Appear. Esteem	.35**	.28*	.12	-.16**	-.14*	.80**	-				
8. Support	.28**	-.29**	.09	-.10	.01	.11	.12*	-			
9. Parent teas.	-.13**	-.07	-.02	.03	.20**	-.29**	-.26**	-.11	-		
10. Peer teasing	-.27**	-.32**	-.13*	.14*	.12*	-.60**	-.56**	-.01	.37**	-	
11. All teasing	-.23**	-.25**	-.09	.11	.20**	-.54**	-.50**	-.07	.81**	.83**	-

*Note:* Attachment (0 = insecure and 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese), SES (1 = neither parent college educated, 2 = one parent college educated, 3 = both parents college educated). \*  $p < .05$ . \*\*  $p < .01$ .

### **Main Analyses**

The two purposes of this study were: to 1) determine the longitudinal relation between weight teasing and body esteem and 2) to determine the extent to which attachment style and social support moderate the relation between weight teasing and body esteem over time. Due to the fact that the data have a hierarchical structure, where time points are nested within the individual, it is best to analyze the data with multilevel modeling techniques (Raudenbush & Bryk, 2002). Multilevel models (MLM), or hierarchical linear models, simultaneously model within-person data (i.e. variation in scores over time; Level 1) and between-persons data (individual differences in mean scores between participants; Level 2), and their interaction. MLM allows us to assess change in our outcome variables over time (i.e. does body esteem change over time?; level 1), but also allows us to predict these changes with specific, time-varying predictors (e.g. teasing; level 1). With MLM, I am also able to assess the extent to which the associations of teasing with body esteem vary as a function of individual differences (e.g., in attachment style, SES, BMI, age and gender; level 2).

Before testing any hypotheses, I assessed the relative stability of each variable by calculating the intraclass correlation (ICC). If individuals tend to change very little over time on a particular measure (e.g. attachment style), then a greater proportion of the variance will be between-persons (Level 2). On the other hand, if individuals fluctuate over time on a particular measure (e.g. body esteem), then the greater proportion will be at the within-person level (Level 1). To the extent that ICCs approach 1.0, they indicate that scores on that particular measure are stable over time, and thus do not vary much within-person. To calculate the ICCs for each variable I used an intercepts-only

multilevel model to partition the variance of each outcome variable into within (i.e. variation in scores over time; Level 1) and between persons (i.e. individual differences in mean scores between participants; Level 2) variance. I then used the following formula to calculate the ICCs:

$$ICC = \frac{\text{Between Variance}}{\text{Between Variance} + \text{Within Variance}}$$

ICCs for each level 1 variable are shown in table 4, indicating that there is sufficient variance to be explained at both levels.

Table 4

*Intraclass correlations (ICCs) for all level 1 variables*

Variable	ICC	% Variance	
		Between	Within
<b>Predictor</b>			
Peer Teasing	.65	65%	35%
Parent Teasing	.57	57%	43%
All Teasing	.62	62%	38%
Social Support	.58	58%	42%
<b>Outcome</b>			
Appearance Esteem	.69	69%	31%
Weight Esteem	.72	72%	28%

To test each of our main hypotheses, a MLM was created. At the within-person level (Level 1), an equation was created for each participant from his or her scores at the various time points (e.g. T1 through T4, which allows us to model each individual's body esteem score at any given time ( $time_t$ ), and examine how body esteem scores vary as a

function of weight teasing and social support at that same time. At the between-persons level (Level 2), we can assess the extent to which the within-person effects (i.e. the within-person intercept and slope) vary as a function of between-persons factors such as attachment style. These equations are estimated using restricted maximum likelihood estimation procedures (Raudenbush & Bryk, 2002).

**Relation between weight teasing and body esteem with attachment as a moderator.** To test whether weight teasing negatively predicted body esteem (Hypothesis 1) and whether this relation would vary as a function of attachment style (Hypothesis 2a), I tested the relation of weight teasing and body esteem, and whether the level 1 effect of weight teasing on body esteem was moderated by (level 2) attachment using the MLM shown below (Note that all variables are grand mean centered<sup>2</sup>).

*Level 1:*

$$\text{Body esteem}_{it} = B_{0i} + B_{1i}(\text{Age}_{it}) + B_{2i}(\text{Teasing}_{it}) + e_{it}$$

*Level 2:*

$$B_0 = \pi_{00} + \pi_{01}(\text{Attach}_i) + \pi_{02}(\text{Gender}_i) + \pi_{03}(\text{SES}_i) + \pi_{04}(\text{BMI}_i) + r_{0i}$$

$$B_1 = \pi_{10} + r_{1i}$$

$$B_2 = \pi_{20} + \pi_{21}(\text{Attach}_i) + r_{2i}$$

To do this, six parallel models were run. In models 1-3, weight esteem at time<sub>t</sub> was regressed on each weight-teasing variable separately (parent, peer, and all teasing) at time<sub>t</sub> with attachment and demographic factors (age, gender<sup>3</sup>, SES, and BMI as

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<sup>2</sup> Grand-mean centering makes the variable estimates of the intercept easier to interpret (i.e. they can be interpreted as a main effect), and reduces the magnitude of correlations between first and second level variables, as well as correlations between random intercepts and slopes (Kreft & de Leeuw, 1998). Grand-mean centering variables does not change the interpretation of the slopes.

<sup>3</sup> I also tested the gender by teasing and gender by teasing by attachment interactions for appearance and weight esteem. None of these interactions were significant (all  $p > .05$ ).

covariates) as level 2 (time invariant) predictors. In models 4-6, appearance esteem at time<sub>*t*</sub> was regressed on the same set of variables. I predicted that weight teasing would negatively predict body appearance and weight esteem (Hypothesis 1). I also predicted that among those with an insecure attachment style, the relation of teasing to body esteem would be strong and negative; however, among those with a secure attachment style, teasing will be less strongly associated with lower body esteem (Hypothesis 2a).

**Parent teasing.** I first assessed the extent to which parent teasing predicted weight and appearance esteem with demographic factors and attachment style in the model (Hypothesis 1). As predicted, there was a significant main effect of parent teasing on weight esteem ( $B = -.23, SE = .04, t = -5.76, p < .001$ ) and appearance esteem ( $B = -.17, SE = .04, t = -3.76, p < .001$ ) where more frequent parent teasing predicted lower weight and appearance esteem (see Tables 5 and 6). As predicted, the relation between parent teasing and both appearance and weight esteem held when controlling for age, SES, gender, and BMI. As shown in Tables 5 and 6, males reported significantly higher weight esteem ( $B = .68, SE = .07, t = 8.83, p < .001$ ) and appearance esteem ( $B = .42, SE = .07, t = 5.64, p < .001$ ) than females. Those classified as obese reported significantly lower weight esteem ( $B = -.42, SE = .09, t = -4.40, p < .001$ ), and appearance esteem ( $B = -.21, SE = .10, t = -2.11, p = .03$ ) than those who were classified as overweight. SES and age did not significantly predict either weight or appearance esteem, and were removed from the models.

Next, I assessed the extent to which attachment style moderated the relation between parent teasing and both weight and appearance esteem (Hypothesis 2a). As shown in Table 5 and 6, there was a main effect of attachment on weight esteem ( $B = .65,$

$SE = .09, t = 6.75, p < .001$ ) and appearance esteem ( $B = .62, SE = .09, t = 6.41, p < .001$ ), where those with an insecure attachment had lower appearance and weight esteem than those with a secure attachment. Contrary to my hypothesis, there was no parent teasing by attachment interaction for either weight esteem ( $B = -.001, SE = .10, t = -.01, p = .98$ ) or appearance esteem ( $B = .10, SE = .12, t = .85, p = .39$ ) indicating no moderation effect.

**Peer teasing.** I first assessed the extent to which peer teasing predicted weight and appearance esteem with demographic factors and attachment style in the model (Hypothesis 1). As predicted, there was a significant main effect of peer teasing on weight esteem ( $B = -.51, SE = .03, t = -13.42, p < .001$ ) and appearance esteem ( $B = -.48, SE = .04, t = -12.07, p < .001$ ), where greater peer teasing predicted lower weight and appearance esteem (see Table 5 and 6). The relation between peer teasing and both body esteem variables held when controlling for age, SES, gender, and BMI. As shown in Table 5 and 6, males reported significantly higher weight esteem ( $B = .49, SE = .06, t = 7.02, p < .001$ ) and appearance esteem ( $B = .21, SE = .06, t = 3.23, p = .001$ ) than females. Those classified as obese reported significantly lower weight esteem ( $B = -.25, SE = .08, t = -3.10, p = .002$ ), but not appearance esteem than those classified as overweight. SES and age did not significantly predict either weight or appearance esteem and were removed from both models.

Next, I assessed the extent to which attachment style moderated the relation between peer teasing and both weight and appearance esteem (Hypothesis 2a). As shown in Table 5 and 6, there was a main effect of attachment on weight esteem ( $B = .47, SE = .09, t = 5.11, p < .001$ ) and appearance esteem ( $B = .43, SE = .09, t = 4.73, p < .001$ ),

where those with an insecure attachment had lower appearance and weight esteem than those with a secure attachment. There was a significant peer teasing by attachment interaction for weight esteem ( $B = -.18$ ,  $SE = .08$ ,  $t = -2.17$ ,  $p = .03$ ; see figure 1). A simple slopes analysis was conducted using Preacher's online calculator (Preacher, Curran, & Bauer, 2006) to examine the effect of peer teasing on those with a secure attachment compared to those with an insecure attachment. The results of this analysis showed that, contrary to my hypothesis, peer teasing was more strongly and negatively associated with weight esteem for those with a secure attachment ( $B = -.64$ ,  $SE = .08$ ,  $t = -7.89$ ,  $p < .01$ ) compared to those with an insecure attachment ( $B = -.45$ ,  $SE = .04$ ,  $t = -10.62$ ,  $p < .01$ ). The peer teasing by attachment interaction was not significant for appearance esteem ( $B = -.03$ ,  $SE = .09$ ,  $t = -.32$ ,  $p = .74$ ), indicating no moderation effect.

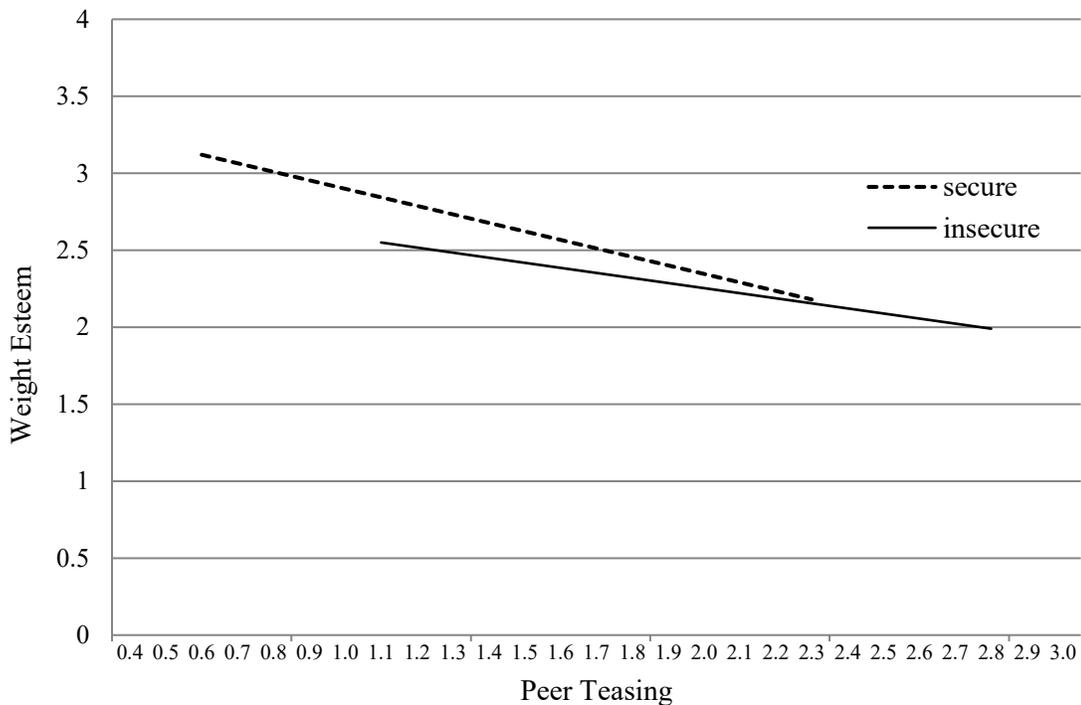


Figure 1: Peer teasing by attachment interaction for weight esteem

*All teasing.* I first assessed the extent to which all teasing predicted weight and appearance esteem with demographic factors and attachment style in the model (Hypothesis 1). There was a significant main effect of all teasing on weight esteem ( $B = -.13, SE = .01, t = -8.15, p < .001$ ) and appearance esteem ( $B = -.10, SE = .01, t = -5.97, p < .001$ ), where all teasing predicted lower weight and appearance esteem (see Table 5 and 6). The relation between all teasing and both appearance and weight esteem held when controlling for age, SES, gender, and BMI. As shown in Table 5 and 6, males reported significantly higher weight esteem ( $B = .60, SE = .07, t = 8.14, p < .001$ ) and appearance esteem ( $B = .33, SE = .07, t = 4.63, p < .001$ ) than females. Those classified as obese reported significantly lower weight esteem ( $B = -.37, SE = .08, t = -4.21, p < .001$ ), but not appearance esteem, than those classified as overweight. SES and age did not significantly predict either weight or appearance esteem and thus was removed from both models.

Next, I assessed the extent to which attachment style moderated the relation between all teasing and both weight and appearance esteem (Hypothesis 2a). As shown in Tables 5 and 6, there was a main effect of attachment on weight esteem ( $B = .57, SE = .09, t = 6.27, p < .001$ ) and appearance esteem ( $B = .54, SE = .09, t = 5.99, p < .001$ ), where those with an insecure attachment had lower appearance and weight esteem than those with a secure attachment. Contrary to my hypothesis, there were no all teasing by attachment interactions for either weight esteem ( $B = -.002, SE = .03, t = -.05, p = .95$ ) or appearance esteem ( $B = .03, SE = .04, t = .87, p = .38$ ) indicating no moderation effect.

Table 5

*Effects of teasing on weight esteem with covariates and attachment in the model*

	Model 1: Parent Teasing				Model 2: Peer Teasing				Model 3: All Teasing			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
<b>Intercept</b>												
Constant (B <sub>00</sub> )	3.35	.03	86.83	<.001	3.29	.03	97.34	<.001	3.35	.03	91.13	<.001
Attach. (B <sub>01</sub> )	.65	.09	6.75	<.001	.47	.09	5.11	<.001	.57	.09	6.27	<.001
Gender (B <sub>02</sub> )	.68	.07	8.83	<.001	.49	.06	7.02	<.001	.60	.07	8.14	<.001
BMI (B <sub>03</sub> )	-.42	.09	-4.40	<.001	-.25	.08	-3.10	.002	-.37	.08	-4.21	<.001
<b>Slope</b>												
Teasing (B <sub>10</sub> )	-.23	.04	-5.76	<.001	-.51	.03	-13.42	<.001	-.13	.01	-8.15	<.001
Teas. * Attach (B <sub>11</sub> )	-.001	.10	-.01	.98	-.18	.08	-2.17	.03	-.002	.03	-.05	.95

*Note:* Covariates that were not significant were removed from the model. Attachment (0 = insecure, 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese). Degrees of freedom for model 1: level 1 df = 294, and level 2 df = 198. Degrees of freedom for model 2: level 1 df = 295, and for level 2 df = 198. Degrees of freedom for model 3: level 1 df = 296, and for level 2 df = 200.

Table 6

*Effects of teasing on appearance esteem with covariates and attachment in the model*

	Model 4: Parent Teasing				Model 5: Peer Teasing				Model 6: All Teasing			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
<b>Intercept</b>												
Constant (B <sub>00</sub> )	3.40	.03	88.94	<.001	3.38	.03	96.22	<.001	3.40	.03	91.43	<.001
Attach.(B <sub>01</sub> )	.62	.09	6.41	<.001	.43	.09	4.73	<.001	.54	.09	5.99	<.001
Gender (B <sub>02</sub> )	.42	.07	5.64	<.001	.21	.06	3.23	.001	.33	.07	4.63	<.001
BMI (B <sub>03</sub> )	-.21	.10	-2.11	.03	-	-	-	-	-	-	-	-
<b>Slope</b>												
Teasing (B <sub>10</sub> )	-.17	.04	-3.76	<.001	-.48	.04	-12.07	<.001	-.10	.01	-5.97	<.001
Teas. * Attach (B <sub>11</sub> )	.10	.12	.85	.39	-.03	.09	-.32	.74	.03	.04	.87	.38

*Note:* Covariates that were not significant were removed from the model. Attachment (0 = insecure, 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese). Degrees of freedom for model 4: level 1 df = 295, and level 2 df = 198. Degrees of freedom for model 5: level 1 df = 297, and for level 2 df = 199. Degrees of freedom for model 6: level 1 df = 298, and for level 2 df = 201

**Relation between weight teasing and body esteem with social support as a moderator.** To test whether weight teasing negatively predicted body esteem (Hypothesis 1) and whether this relation would vary as a function of social support (Hypothesis 2b), six models were run shown by the multilevel model below (Note that all variables are grand mean centered).

*Level 1:*

$$\text{Body esteem}_{it} = B_{0i} + B_{1i}(\text{Age}_{it}) + B_{2i}(\text{Teasing}_{it}) + B_{3i}(\text{Support}_{it}) + B_{4i}(\text{Teasing}_{it} * \text{Support}_{it}) + \epsilon_{it}$$

*Level 2:*

$$B_0 = \pi_{00} + \pi_{01}(\text{Gender}_i) + \pi_{02}(\text{SES}_i) + \pi_{03}(\text{BMI}_i) + r_{0i}$$

$$B_1 = \pi_{10} + r_{1i}$$

$$B_2 = \pi_{20} + r_{2i}$$

$$B_3 = \pi_{30} + r_{3i}$$

$$B_4 = \pi_{40} + r_{4i}$$

In the first three models (7-9), weight esteem at time<sub>t</sub> was regressed on each weight-teasing variable separately (parent, peer and all teasing) at each time<sub>t</sub> with social support, the interaction of weight teasing by social support and demographic factors (age, gender<sup>4</sup>, SES, and BMI as covariates). In models 10-12, appearance esteem at time<sub>t</sub> was regressed on the same variables at each time<sub>t</sub>. I predicted that weight teasing would predict lower appearance and weight esteem (Hypothesis 1). I also predicted that among those with lower social support, the relation of teasing to body esteem would be strong

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<sup>4</sup> I also tested the gender by teasing and gender by teasing by support interactions for appearance and weight esteem. None of these interactions were significant (all  $p > .05$ ).

and negative; however, among those with higher social support, teasing would be less strongly associated with lower body esteem (Hypothesis 2b).

**Parent teasing.** I first assessed the extent to which parent teasing predicted weight and appearance esteem with demographic factors and social support in the model (Hypothesis 1). As predicted, there was a significant main effect of parent teasing on weight esteem ( $B = -.21, SE = .04, t = -4.71, p < .001$ ) and appearance esteem ( $B = -.16, SE = .05, t = -3.06, p = .003$ ) where more frequent parent teasing predicted lower weight and appearance esteem (see Tables 7 and 8). As predicted, the relation between parent teasing and both appearance and weight esteem held when controlling for age, SES, gender, and BMI. As shown in Tables 7 and 8, age negatively predicted weight esteem ( $B = -.04, SE = .02, t = -1.93, p = .05$ ), but not appearance esteem. Males reported significantly higher weight esteem ( $B = .78, SE = .09, t = 9.59, p < .001$ ) and appearance esteem ( $B = .53, SE = .08, t = 6.65, p < .001$ ) than females. Those classified as obese reported significantly lower weight esteem ( $B = -.44, SE = .09, t = -4.48, p < .001$ ), and appearance esteem ( $B = -.23, SE = .10, t = -2.24, p = .02$ ) than those classified as overweight. SES did not significantly predict either weight or appearance esteem and thus was removed from the models.

Next, I assessed the extent to which social support moderated the relation between parent teasing and both weight and appearance esteem (Hypothesis 2b). As shown in Table 4, there was a significant main effect of social support on weight esteem ( $B = .13, SE = .04, t = 3.54, p < .001$ ) and appearance esteem ( $B = .14, SE = .03, t = 3.79, p < .001$ ), where social support positively predicted both weight and appearance esteem. Contrary to my hypothesis, the interaction of parent teasing and social support was not

significant for either weight esteem ( $B = .008, SE = .04, t = .17, p = .86$ ) or appearance esteem ( $B = .04, SE = .05, t = .83, p = .40$ ), indicating no moderation effect (see Table 6 and 7).

**Peer teasing.** I first assessed the extent to which peer teasing predicted weight and appearance esteem with demographic factors and social support in the model (Hypothesis 1). As predicted, there was a significant main effect of peer teasing on weight esteem ( $B = -.51, SE = .03, t = -13.37, p < .001$ ) and appearance esteem ( $B = -.40, SE = .03, t = -12.62, p < .001$ ) where more frequent peer teasing predicted lower weight and appearance esteem (see Tables 7 and 8). As predicted, the relation between peer teasing and both appearance and weight esteem held when controlling for age, SES, gender, and BMI. As shown in Tables 7 and 8, age negatively predicted weight esteem ( $B = -.04, SE = .02, t = -2.28, p = .02$ ), but not appearance esteem. Males reported significantly higher weight esteem ( $B = .55, SE = .07, t = 7.93, p < .001$ ) and appearance esteem ( $B = .28, SE = .07, t = 4.02, p < .001$ ) than females. Those classified as obese reported significantly lower weight esteem ( $B = -.27, SE = .08, t = -3.15, p < .001$ ), but not appearance esteem, than those classified as overweight. SES did not significantly predict either weight or appearance esteem and were removed from the models.

Next, I assessed the extent to which social support moderated the relation between peer teasing and both weight and appearance esteem (Hypothesis 2b). As shown in Table 7 and 8, there was a significant main effect of social support on weight esteem ( $B = .10, SE = .03, t = 2.89, p = .004$ ) and appearance esteem ( $B = .10, SE = .03, t = 2.94, p < .001$ ), where social support positively predicted both weight and appearance esteem. Contrary to my hypothesis, the interaction of peer teasing and social support was not

significant for either weight esteem ( $B = -.003, SE = .03, t = -.12, p = .90$ ) or appearance esteem ( $B = .005, SE = .03, t = -.16, p = .86$ ), indicating no moderation effect (see Table 7 and 8).

**All teasing.** I first assessed the extent to which all teasing predicted weight and appearance esteem with demographic factors and social support in the model (Hypothesis 1). As predicted, there was a significant main effect of all teasing on weight esteem ( $B = -.13, SE = .01, t = -7.73, p < .001$ ) and appearance esteem ( $B = -.11, SE = .02, t = -5.41, p < .001$ ) where more frequent peer teasing predicted lower weight and appearance esteem (see Tables 7 and 8). As predicted, the relation between all teasing and both appearance and weight esteem held when controlling for age, SES, gender, and BMI. As shown in Tables 7 and 8, males reported significantly higher weight esteem ( $B = .69, SE = .07, t = 8.83, p < .001$ ) and appearance esteem ( $B = .41, SE = .07, t = 5.48, p < .001$ ) than females. Those classified as obese reported significantly lower weight esteem ( $B = -.39, SE = .09, t = -4.29, p < .001$ ), but not appearance esteem, than those classified as overweight. SES and age did not significantly predict either weight or appearance esteem and were removed from the models.

Next, I assessed the extent to which social support moderated the relation between all teasing and both weight and appearance esteem (Hypothesis 2b). As shown in Table 7 and 8, there was a main effect of social support on weight esteem ( $B = .10, SE = .03, t = 2.73, p = .007$ ) and appearance esteem ( $B = .11, SE = .03, t = 3.12, p = .002$ ), where social support positively predicted both weight and appearance esteem. Contrary to my hypothesis, there were no all teasing by social support interactions for either weight

esteem ( $B = .0006$ ,  $SE = .01$ ,  $t = .04$ ,  $p = .96$ ) or appearance esteem ( $B = .009$ ,  $SE = .01$ ,  $t = .59$ ,  $p = .55$ ), indicating no moderation effect.

Table 7

*Effects of teasing on weight esteem with covariates and social support in the model*

	Model 7: Parent Teasing				Model 8: Peer Teasing				Model 9: All Teasing			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
<b>Intercept</b>												
Constant (B <sub>00</sub> )	3.33	.03	84.51	<.001	3.34	.03	99.61	<.001	3.36	.03	90.58	<.001
Gender (B <sub>01</sub> )	.78	.09	9.59	<.001	.55	.07	7.93	<.001	.69	.07	8.83	<.001
BMI (B <sub>02</sub> )	-.44	.09	-4.48	<.001	-.27	.08	-3.15	<.001	-.39	.09	-4.29	<.001
<b>Slope</b>												
Age (B <sub>10</sub> )	-.04	.02	-1.93	.05	-.04	.02	-2.28	.02	-	-	-	-
Teasing (B <sub>20</sub> )	-.22	.04	-4.71	<.001	-.51	.03	-13.37	<.001	-.13	.01	-7.73	<.001
Support (B)	.13	.04	3.34	<.001	.10	.03	2.89	.004	.10	.03	2.73	.007
Teas. * Support (B)	.008	.04	.17	.86	-.003	.03	-.12	.90	.0006	.01	.04	.96

*Note:* Covariates that were not significant were removed from the model. Attachment (0 = insecure, 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese). Degrees of freedom for model 7: level 1 df = 295, and level 2 df = 186. Degrees of freedom for model 8: level 1 df = 296, and for level 2 df = 197. Degrees of freedom for model 9: level 1 df = 297, and for level 2 df = 197.

Table 8

*Effects of teasing on appearance esteem with covariates and social support in the model*

	Model 10: Parent Teasing				Model 11: Peer Teasing				Model 12: All Teasing			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
<b>Intercept</b>												
Constant (B <sub>00</sub> )	3.40	.03	87.23	<.001	3.38	.03	101.34	<.001	3.39	.03	92.15	<.001
Gender. (B <sub>01</sub> )	.53	.08	6.65	<.001	.28	.07	4.02	<.001	.41	.07	5.48	<.001
BMI (B <sub>02</sub> )	-.23	.10	-2.24	.02	-	-	-	-	-	-	-	-
<b>Slope</b>												
Teasing (B <sub>10</sub> )	-.16	.05	-3.06	.003	-.40	.03	-12.62	<.001	-.11	.02	-5.41	<.001
Support (B <sub>20</sub> )	.14	.03	3.79	<.001	.10	.03	2.94	<.001	.11	.03	3.12	.002
Teas. * Support (B <sub>30</sub> )	.04	.05	.83	.40	-.005	.03	-.16	.86	.009	.01	.59	.55

*Note:* Covariates that were not significant were removed from the model. Attachment (0 = insecure, 1 = secure), Gender (0 = female, 1 = male), BMI (4 = overweight, 5 = obese). Degrees of freedom for model 10: level 1 df = 296, and level 2 df = 198. Degrees of freedom for model 11: level 1 df = 298, and for level 2 df = 199. Degrees of freedom for model 12: level 1 df = 299, and for level 2 df = 200

### Discussion

Childhood obesity is heavily stigmatized in Western society, which puts youth with overweight and obesity at risk for weight teasing by parents, peers, and other adults (e.g. Goldfield et al., 2010b; Latner & Stunkard, 2003; Puhl & Latner, 2007; Richardson et al., 1961). Although weight teasing is a common experience for youth with overweight and obesity, there are differences in how youth manage this stigma, and not all youth develop body dissatisfaction as a result. As such, the purpose of the present study was to prospectively examine the relation between weight teasing and body esteem in youth with overweight and obesity, and whether this relation would vary as a function of the proposed protective factors- secure attachment and social support. As predicted, the results of the present study showed that parent, peer and a combination of the two types of teasing negatively predicted appearance and weight esteem while controlling for demographic factors. I also found that secure attachment and social support positively predicted appearance and weight esteem. There was not, however, much evidence for the hypothesis that attachment style and social support would moderate the effect of weight teasing on weight or appearance esteem. That is, although I did find that secure attachment significantly moderated the relation between peer teasing and weight esteem, this interaction was in the opposite direction to my hypothesis. Secure attachment did not buffer against the negative effects of peer teasing on weight esteem; rather, the relation between peer teasing and weight esteem was stronger and more negative for those with a secure attachment compared to those with an insecure attachment.

The finding that peer teasing was more strongly and negatively associated with weight esteem for those with a secure attachment compared to an insecure attachment is

surprising, as previous research on attachment style indicates that those with a secure attachment are more resilient in the face of adversity and show greater emotion regulation and coping skills than those with an insecure attachment (Ciechanowski & Katon, 2006; Sroufe, 1983). As such, I predicted that those with a secure attachment would be less affected by teasing than their insecurely attached peers and report little to no change in body esteem as a result. However, this was not the case. Rather, those with a secure attachment were most likely to report high levels of weight esteem only in the absence of peer teasing. This suggests that peer teasing may be a particularly powerful threat, even in the face of a secure attachment. Past research has demonstrated that peer teasing is extremely harmful for adolescents to experience, and the negative effects of this teasing on self-image can last well into adulthood (Eisenberg et al., 2003; Goldfield et al., 2010b; Ledley et al., 2005; Puhl & Luedicke, 2011). In addition, youth with overweight and obesity are often marginalized by peers due to their appearance, and are aware that their weight is the reason they are marginalized (Kimm & Obarzanek, 2002; Pierce & Wardle, 1997). These findings taken together with the results of the present study suggest that peer teasing is emotionally detrimental to all types of youth with overweight and obesity, even those who are better psychologically equipped from an attachment perspective to deal with the adverse effects.

One explanation for the counterintuitive finding where peer teasing was more strongly and negatively associated with weight esteem for those securely attached compared to insecurely attached may be due to the way insecure attachment was categorized in the present study. Attachment was treated as a dichotomous variable (secure vs. insecure), where preoccupied, dismissing, and fearful attachment styles were

combined to create the 'insecure' category. Because the insecure category consists of three different attachment styles which may differ in their associations with body esteem and reactions to teasing, we are unable to tease out which attachment style of those categorized as 'insecure' was driving the observed effect for the insecure category. Previous research has shown that those with a preoccupied (anxious) attachment style tend to seek approval from others regarding their appearance and fear rejection from others (Goodvin, et al., 2008; Park & Beaudet, 2007; Srivastava & Beer, 2005), whereas those with a dismissing attachment style avoid close relationships and do not seek approval from others (Bartholomew & Horowitz, 1991). Those with a fearful attachment are typically categorized together with 'avoidant' in this regard, as they avoid close relationships due to fear of rejection (Bartholomew & Horowitz, 1991). Thus, it is reasonable to speculate that those with a preoccupied (anxious) attachment would experience a stronger and more negative effect of weight teasing on body esteem compared to those with dismissing or fearful attachment styles. Again, by combining all three styles as 'insecure' it is possible that the negative effect of peer teasing on weight esteem for those with a preoccupied attachment may have been dampened by those with a dismissing or fearful attachment, who may not have been as affected by the teasing. As such, this categorization of 'insecure' may explain why we did not observe a steeper decline in weight esteem with higher levels of teasing for the insecure group. Due to the fact that there were only a small number of participants who self-rated as preoccupied, fearful or dismissing (N = 29, 36, and 21 at T1 respectively) I lacked power to test the distinct effects of these 'insecure' groups separately. Thus, future research with larger

samples should examine the extent to which the different ‘insecure’ attachment styles moderate the effect of teasing on body esteem.

It is important to note that although peer teasing was more strongly and negatively associated with weight esteem for those with a secure attachment compared to insecure attachment, this does not necessarily suggest that secure attachment puts youth at greater risk for body dissatisfaction. Although secure attachment did not buffer the negative effects of weight teasing on body esteem, the significant main effects of attachment indicated that those with a secure attachment still reported higher weight esteem than those with an insecure attachment at all levels of teasing. This difference was most pronounced at low frequency of peer teasing, where those with a secure attachment reported much higher weight esteem than those with an insecure attachment. However, as the frequency of peer teasing increased, the difference in reports of weight esteem for both secure and insecure attachment became less pronounced. In other words, those with a secure attachment still reported higher weight esteem at all levels of teasing compared to those with an insecure attachment, so although secure attachment does not ‘buffer’ the effects of weight teasing on body image per se, youth still report a more positive body image when securely attached compared to insecurely attached independent of weight teasing.

Although no other significant interactions were found between teasing and attachment or social support, the main effects of teasing on body esteem yield novel findings nonetheless. Few studies have longitudinally assessed how teasing by different groups (i.e. peers vs. parents vs. a combination of the two) differently affect body image during adolescence. The results of the present study showed that peer teasing was more

closely associated with appearance and weight esteem than parent teasing or the combination of peer and parent teasing. These results are in line with past research that suggests peer relationships become more important to adolescents than parent relationships as they grow older and more independent (Hazan & Zeifman, 1994; Lippincott & Deutsch, 2005; Nickerson & Nagle, 2005). Thus, adolescents may place more value on the opinions of peers than on opinions of parents, and thus may be more distressed by peer teasing. The finding that peer teasing is most strongly and negatively associated with body image contrasts previous research by Eisenberg and colleagues (2003) who found that a combination of peer and parent teasing was more detrimental to body image (among other mental health outcomes) than each type of teasing separately.

Although I predicted that high social support would buffer against the negative effects of weight teasing on body esteem, the results of the present study did not support this hypothesis as all weight teasing by social support interactions were not significant. Despite research that suggests social support may buffer adolescents against the negative effects of peer victimization on negative mental health outcomes (e.g. Boivin et al., 2001; Bowes et al., 2010; Cooley et al., 2015), the results of the present study suggest that this is not the case for weight teasing and body dissatisfaction in youth with overweight and obesity. One potential explanation may be that youth with overweight and obesity are often marginalized by peers, and thus may not have as strong of a social support network compared to youth who are normal weight (Kimm & Obarzanek, 2002). Thus, youth who reported having a higher level of social support in the present study were only high compared to other youth with overweight and obesity, and may still be low compared to average levels of social support for youth of normal weight.

Despite null interactions between teasing and social support on body esteem, I did find significant main effects of social support on both appearance and weight esteem, where greater social support was associated with higher weight and appearance esteem. This is in line with previous research that suggests higher social support is associated with higher body image (Byely et al., 2000; Stice et al., 2002; Swarr & Richards, 1996), and lack of peer support is associated with greater body image concerns (Alta et al., 2007; Stice & Whitenton, 2002). Although social support did not buffer against weight teasing in the present study, the results are valuable nonetheless, and suggest that promoting and maintaining close interpersonal relationships among peers and parents may lead to better body image for youth with overweight and obesity.

### **Limitations and Future Directions**

Although the present study yielded some interesting findings, some limitations should be noted. First, the present study relied on self-report data that could have been influenced by social desirability biases. For instance, youth may have underreported their experiences of weight teasing and over reported satisfaction with their bodies and social support. This may have been especially true for youth who were struggling with weight teasing and their body image at the time of the study, and may not have been comfortable accurately reporting the severity of the situation.

Another limitation is the questionnaire used to assess attachment. Although the ARQ is a widely used measure to assess attachment style in adolescents and adults, more robust measures are available that were not suitable for the REAL study due to their length. Moreover, attachment was assessed dichotomously as 'secure' vs. 'insecure'. Future studies should assess each attachment style separately (i.e. secure vs. preoccupied

vs. fearful vs. dismissing), rather than categorizing preoccupied, fearful, and dismissing as 'insecure' to see if the same pattern of results emerges.

Another limitation is the questionnaire used to assess teasing. Participants in the present study may have experienced subtler forms of weight teasing that were not adequately captured by the questionnaire. A qualitative study by Taylor (2011) showed that adolescents report peer teasing often happens in more subtle ways to avoid punishment by teachers. In addition, they found that indirect teasing often takes the form of gossip within peer groups, where adolescents subtly communicate body size norms through the constant surveillance, comparison, and critique of peers. Thus, it is possible that negative comments directed to another person's weight may in turn cause an adolescent to feel bad about their own weight if the target of the teasing has a similar body size to them, even though they are not the direct target of the teasing. Similarly, peers and parents can make remarks to an adolescent that are not explicitly about their weight that may still cause feelings of body dissatisfaction (e.g. comments about food, or physical activity levels). Future studies should keep this in mind when designing questionnaires in order to adequately capture all forms of weight teasing.

Other limitations are due to the sample used. First, the sample is comprised of youth from one region in Canada, and not all youth approached had consented to participate, thus results may not be generalizable to the community or other regions in Canada. Second, the present study examined youth with overweight and obesity together. Although youth with overweight and obesity are commonly examined together in other research, due to issues with sample size, there was a greater proportion of youth with overweight compared to obesity in the present study. Although weight status (i.e.

overweight or obese) was controlled for in all analyses, it is possible that the present findings are more generalizable to those who are overweight than those with obesity. Thus, future studies should aim to examine participants with overweight and obesity separately to see if the same pattern of results emerges. Finally, the results of the present study are not generalizable to youth who are normal weight or underweight. Due to the fact that normal weight and underweight youth experience weight teasing as well (Neumark-Sztainer et al., 2002; Puhl & Luedicke, 2011), future research should examine if the same patterns emerge in normal weight and underweight youth. Finally, the present study had considerable attrition. The reduced sample over the four time points could have influenced the power of the present study. To some extent, the analyses used in the present study (i.e. MLM) can handle missing data. Nevertheless, some caution is warranted when interpreting effects observed in the present study.

Although there are a few limitations, the present study had multiple strengths. One such strength was the longitudinal design that included four time points spanning 11 years, which allowed us to examine the relations between key variables across different developmental periods. Further, no studies to date have longitudinally assessed whether attachment style or social support moderate the effect of weight teasing on body image in overweight/obese youth, highlighting the novelty of data generated. This study provided an evidence base in which future research can build, and focused on a population that is at high risk for both weight teasing and body dissatisfaction, highlighting the need to identify risk and protective factors of this relationship. The results of the present study add to the growing body of literature that demonstrates the harmful effects of peer teasing on body esteem for youth with overweight and obesity. Given the negative physical and

mental health correlates of body dissatisfaction in adolescents, these findings reinforce the need for future studies to examine other protective factors in the relation between weight teasing and body esteem. Further, the present study highlights the need for more effective bullying prevention and intervention programs in schools and within families to reduce the prevalence of weight teasing and mitigate its negative effects on body esteem.

### **Conclusion**

This study was the first to prospectively examine protective factors that would buffer against the negative effects of weight teasing on body image in youth with overweight and obesity. Results of the present study showed that peer teasing negatively predicted body image in youth with overweight and obesity, even those who were securely attached. Although the proposed protective factors did not buffer against the negative effects of weight teasing on body image, the study still yielded some valuable findings in that those with a secure attachment and high social support still reported higher levels of body image compared to their peers with an insecure attachment and low social support. In light of the noted limitations, the present study adds to a growing body of literature on the resiliency of youth with overweight and obesity. Results support the conduct of school-based and parent-based interventions to determine if targeting reductions in weight teasing leads to improvement in body esteem and other mental health outcomes. Future research should also build on current findings and utilize longitudinal designs to examine other protective factors that may buffer against the potential negative effects of weight-related stigma on body image in youth with overweight and obesity in order to better inform body dissatisfaction intervention and prevention strategies.

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## Appendix A

## Body Esteem Scale for Adolescents and Adults (BESAA)

Indicate HOW OFTEN YOU AGREE with the following statements ABOUT YOURSELF by circling the appropriate number

	Never	Seldom	Sometimes	Often	Always
1. I like what I look like in pictures.....	0	1	2	3	4
2. Other people consider me good looking.....	0	1	2	3	4
3. I'm proud of my body.....	0	1	2	3	4
4. I am preoccupied with trying to change my body weight.....	0	1	2	3	4
5. I think my appearance would help me get a job.....	0	1	2	3	4
6. I like what I see when I look in the mirror.....	0	1	2	3	4
7. There are lots of things I'd change about my looks if I could.....	0	1	2	3	4
8. I am satisfied with my weight.....	0	1	2	3	4
9. I wish I looked better.....	0	1	2	3	4
10. I really like what I weigh.....	0	1	2	3	4
11. I wish I looked like someone else.....	0	1	2	3	4
12. People my own age like my looks.....	0	1	2	3	4
13. My looks upset me.....	0	1	2	3	4
14. I'm as nice looking as most people.....	0	1	2	3	4
15. I'm pretty happy about the way I look.....	0	1	2	3	4
16. I feel I weigh the right amount for my height.....	0	1	2	3	4
17. I feel ashamed of how I look.....	0	1	2	3	4
18. Weighing myself depresses me.....	0	1	2	3	4
19. My weight makes me unhappy.....	0	1	2	3	4
20. My looks help me to get dates.....	0	1	2	3	4
21. I worry about the way I look.....	0	1	2	3	4
22. I think I have a good body.....	0	1	2	3	4
23. I'm looking as nice as I'd like to.....	0	1	2	3	4

## Appendix B:

## McKnight Risk Factor Survey IV

Peer and Parent Weight teasing subscale items bolded

Social Support (Support/Sharing) subscale items underlined

The questions below ask about what it is like to be a teenager today. Please circle the number that best applies to you.

In the past year, how often...

	Never	Rarely	Sometimes	Often	Always
1. did you feel confident?.....	1	2	3	4	5
2. did you drink alcohol when you were by yourself or with friends?.....	1	2	3	4	5
3. did you eat less than usual when you were bored?.....	1	2	3	4	5
<b>4. has your father made a comment to you about your weight or your eating that made you feel bad? (“father” refers to the adult man in your life who acts most like a father to you).....</b>	1	2	3	4	5
<b>** I do not have any contact with anyone that I think of as a “father”.....</b>	0				
5. have you changed your eating when you were around girls/young women?.....	1	2	3	4	5
<u>6. have you had someone you can count on to listen to you when you need to talk?.....</u>	1	2	3	4	5
7. did you use drugs (not medicine)?.....	1	2	3	4	5
8. did you eat less than usual to try to feel better about yourself?.....	1	2	3	4	5
<u>9. have you had someone to share your most private worries and fears with?.....</u>	1	2	3	4	5
<b>10. have girls/young women (including sisters)</b>	1	2	3	4	5

made fun of you because of your weight?.....					
11. have you liked most things about yourself?..	1	2	3	4	5
12. have you had headaches?.....	1	2	3	4	5
13. has a teacher/ coach made a comment to you about your weight that made you feel bad?.....	1	2	3	4	5
14. did you smoke cigarettes?.....	1	2	3	4	4
15. have you had stomachaches?.....	1	2	3	4	5
<b>16.</b> have you tried to change your weight so you would not be teased by boys/young men (including brothers)?.....	1	2	3	4	5
17. have you been happy just the way you are?..	1	2	3	4	5
<b>18.</b> have boys/young men (including brothers) made fun of you because of your weight?.....	1	2	3	4	5
<b>19.</b> has your mother made a comment to you about your weight or your eating that made you feel bad? (“mother” refers to the adult woman in your life who acts most like a mother to you)	1	2	3	4	5
** I do not have any contact with anyone that I think of as a “mother”.....	0				
<u>20.</u> have you had someone to help you understand a problem when you needed it?.....	1	2	3	4	5
21. did you eat less than usual when you were upset?.....	1	2	3	4	5
22. have you taken diet pills TO LOSE WEIGHT?...	1	2	3	4	5
23. have your female friends talked about wanting to lose weight?.....	1	2	3	4	5
24. have you changed your eating when you were around boys/young men?.....	1	2	3	4	5
<b>25.</b> have you tried to change your weight in order to avoid teasing from girls/young women (including sisters)?.....	1	2	3	4	5

In the past year...

	Not at all	A little	Pretty much	A lot	Totally
<b>26.</b> if boys (including brothers) have teased you about your weight, how much has it at all much has it changed the way you feel about yourself?.....	1	2	3	4	5
** I have not been teased.....	0				
<b>27.</b> how much do you think your weight made boys NOT like you?.....	1	2	3	4	5
<b>28.</b> how important has it been to your friends that you be thin?.....	1	2	3	4	5
<b>29.</b> If girls (including sisters) have teased you about your weight, how much has it changed the way you feel about yourself?.....	1	2	3	4	5
** I have not been teased .....	0				
<b>30.</b> how important has it been to your mother that you be thin? (“mother” is the adult woman in your life who acts most like a mother to you).....	1	2	3	4	5
** I do not have any contact with anyone that I think of as a “mother”.....	0				
<b>31.</b> how much do you think your weight made girls NOT like you?.....	1	2	3	4	5
<b>32.</b> how important has it been to your father that you be thin? (“father” is the adult man in your life who acts most like a father to you)...	1	2	3	4	5
** I do not have any contact with anyone that I think of as a “father”.....	0				
<b>33.</b> how important has it been to your friends that they be thin?.....	1	2	3	4	5

## Appendix C:

## Adolescent Relationship Questionnaire (ARQ)

Below are FOUR DIFFERENT WAYS PEOPLE MAY FEEL ABOUT OTHERS

Read each paragraph carefully, then tell how much the description sounds like you by circling ONE number from 1= 'not at all like me' to 7= 'very much like me'

A. It is easy for me to feel close to people. I feel OK asking people for help and I know that they will usually help me. When people ask me for help, they can count on me. I don't worry about being alone and I don't worry about others not liking me.

Not like me							Very much like me
1	2	3	4	5	6	7	

B. It is hard for me to feel close to people. I want to be close to people, but I find it hard to trust them. I find it hard to ask people for help. I worry that if I get too close to people, they will end up hurting me.

Not like me							Very much like me
1	2	3	4	5	6	7	

C. I want to be really close to people, but they don't want to get that close to me. I am unhappy if I don't have people that I feel close to. I sometimes think that I care about people more than they care about me

Not like me							Very much like me
1	2	3	4	5	6	7	

D. I don't care if I am close to people. It is very important for me not to ask for help, because I like to do things on my own. I don't like it if people ask me for help.

Not like me							Very much like me
1	2	3	4	5	6	7	

Overall, which description sounds most like you? (circle only ONE letter)

- A.            B.            C.            D.

## Appendix D:

## Missing data analyses

**Little's MCAR test**

$$\chi^2 = 49.65, df = 42, p = .19$$

**Comparison between those who participated at T2 and those who did not.**

T-tests revealed no significant differences between those who participated at T2 and those who did not on weight esteem, appearance esteem, social support, peer teasing, parent teasing, or all teasing (all  $p > .10$ ).

**Comparison between those who participated at T3 and those who did not.**

T-tests revealed that those who participated at T3 reported significantly lower weight esteem compared to those who did not participate ( $M = 3.02, SD = .96$  vs.  $M = 3.37, SD = .90$ ;  $t(139) = 2.07, p = .04, D = .35$ ). There were no significant differences between those who participated and those who did not on appearance esteem, social support, peer teasing, parent teasing, or all teasing (all  $p > .06$ ).

**Comparison between those who participated at T4 and those who did not.**

T-tests revealed that those who participated at T4 reported significantly higher peer teasing compared to those who did not participate ( $M = 1.96, SD = .88$  vs.  $M = 1.58, SD = .81$ ;  $t(274) = -2.15, p = .03, D = -.37$ ). There were no significant differences between those who participated and those who did not on weight esteem, appearance esteem, social support, parent teasing, or all teasing (all  $p > .06$ ).

