EXAMINATION OF PATHWAYS BY WHICH PARENTAL ATTACHMENT AND SECONDARY ATTACHMENT STRATEGIES PREDICT DISORDERED EATING ATTITUDES AND BEHAVIOURS

by

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Abstract

Research has established a connection between insecure attachment and disordered eating (O'Kearney, 1996; O'Shaughnessy & Dallos, 2009; Ward et al., 2000). Over three studies, the current research examined the relationship between attachment and disordered eating attitudes and behaviours (DEABs) in the context of control theory analysis (Kobak, Cole, Ferenz-Gillies, Fleming and Gamble, 1993). This theory was developed to help understand the relationship between internal working models and the development of attachment strategies to regulate emotion. The purpose of Study 1 was to investigate the processes by which parental attachment and the secondary attachment strategies proposed by Kobak et al. are associated with DEABs. Participants included 281 female high school and university students (M = 19.29 years). Multiple mediation models were tested using bootstrapping methods outlined by Preacher and Hayes (2008). Results suggested that the relationship between both anxious (hyperactivated) and avoidant (deactivated) attachment strategies and DEABs were significantly mediated by Negative Affect, self-esteem, and Perfectionistic Self-Promotion. As Avoidant and Anxious Attachment were highly correlated, a composite variable, Overall Insecure Attachment was created. The relationship between Overall Insecure Attachment and DEABs was similarly mediated. Multiple regression analyses revealed that feelings of alienation from both mothers and fathers significantly predicted Avoidant, Anxious, and Overall Insecure Attachment. Results suggested that the development of DEABs may not be associated with one type of secondary attachment strategy, but rather insecure

attachment in general. Further, parental attachment relationships predicted insecure attachment strategies.

The goal of Study 2 was to extend the current understanding of the relationship between parental attachment, insecure attachment and DEABs in an adolescent female sample (N = 167, *M* = 14.78 years) and explore body mass index (BMI) as a potential moderating variable. The relationship between higher maternal attachment and DEABs was significantly mediated by lower Negative Affect, greater self-esteem, and lower Overall Insecure Attachment. Higher paternal attachment predicted lower Negative Affect and greater self-esteem which, in turn, predicted lower DEABs. Perfectionistic Self-Promotion was not a uniquely significant mediator for either maternal or paternal attachment. The indirect effects of the uniquely significant mediators were not dependent on level of BMI, suggesting that the relationship between parental attachment and DEABs through Negative Affect and self-esteem is significant for adolescent females regardless of their BMI.

Finally, Study 3 combined the data sets from the first two studies to test a series of serial multiple mediation models wherein parental attachment was hypothesized to predict secondary attachment strategies (Overall Insecure Attachment) which, in turn, would predict Negative Affect, self-esteem, or Perfectionistic Self-Promotion, and then predict DEABs. Models were run separately for mothers and fathers, and for high school and university participants. For fathers, results suggested that the relationship between parental attachment and DEABs was significantly mediated by Negative Affect, self-esteem, and Perfectionistic Self-Promotion, but only through Overall Insecure

Attachment. Models were similar for high school and university females. For mothers, greater attachment predicted lower Overall Insecure Attachment which, in turn, predicted lower Negative Affect and greater self-esteem, and then lower DEABs. Perfectionistic Self-Promotion emerged as a uniquely significant predictor in the relationship between maternal attachment and DEABs, but only for university students. While the results are cross-sectional in nature, they suggest that parental attachment impacts the development of secondary attachment strategies to regulate emotion. Attachment insecurity, in turn, predicts greater Negative Affect, lower self-esteem, and potentially greater attempts to promote oneself as perfect, leading to greater DEABs. Theoretical and clinical implications and future directions are discussed.

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Overview of Attachment Theory

Attachment is a way to conceptualize the strong affectional bonds that human beings have to important people in their lives (Bowlby, 1977). Although originally applied to mother-infant relationships (Ainsworth, Dlehar, Waters, & Wall, 1978; Main & Solomon, 1990), attachment theory and research has evolved to encompass parental relationships in childhood and adolescence, adolescents' peer relationships (Armsden & Greenberg, 1987), adult romantic relationships (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987), one's relationship to God (Kirkpatrick, 1994; Wright & Spinner, 1997), adult functioning, and adult mental health (Dozier, Stoveall-McClough, & Albus, 2008).

Attachment Behaviour System and the Secure Base Relationship

To be attached is to have someone who encourages exploration of the world and acts as a secure base in times of distress (Waters & Cummings, 2000). Stemming from evolutionary-ethological tradition, Bowlby hypothesized an attachment behaviour system acts to maintain proximity to significant others who provide protection and psychological security. Attachment behaviour (i.e., crying)is any type of behaviour that results in attaining or maintaining proximity to a significant other. These behaviours are most evident when the individual is frightened, tired, or sick and is comforted by the significant other. Although attachment behaviours are less evident at other times, the individual becomes confident over time that his/her caregiver will be available and responsive. This consistency provides the individual with a strong feeling of security.

Attachment behaviours are most obvious in infancy and childhood, but may emerge throughout one's life time, especially in times of distress (Bowlby, 1982).

Waters and Cummings (2000) assert that secure-base behaviour may be observed from infancy through adolescence. Supportive caregiving relationships and contexts foster the child's ability to use the attachment figure as a secure base. In infancy, the caregiver's sensitive and cooperative interaction with the infant helps the infant to anticipate caregiver behaviour and acquire familiarity and preference for the primary caregiver. As the infant grows and develops, the caregiver continues to monitor the infant's activities, promotes exploration, and encourages independence, while consistently providing a secure base for the child in times of distress. The infant's use of the secure base becomes consolidated through consistent and sensitive caregiving over time.

In childhood and adolescence, peers become increasingly important. Peers become ad hoc secure bases and the young person becomes a secure base for peers. The youth uses representations and experience gleaned from his/her own secure base experiences with his/her caregiver(s). Attachment representations are elaborated and consolidated with both peer and romantic attachment relationships. Through this developmental stage, the parent's reactions to the adolescent's decisions regarding relationships and the manner in which parents and peers model relationships help solidify expectations for relationships (Waters & Cummings, 2000).

Internal Working Models

From these early relational experiences, children and adolescents build mental

representations of how they should view themselves and others. Adolescents' attachment to their mothers and fathers provide a mental template or model for how relationships work and what may be expected from others (i.e., predictability, consistency). Internal working models may be revised with new attachment relationships; however, the templates formed for self and others become increasingly resistant to change. The individual assimilates new relationships, such as with a spouse, child, employer, or therapist, to their existing internal working model for relationships with others. Individuals will also expect to be perceived and treated by others in a manner that is consistent with their own self-models (Bowlby, 1977).

Patterns of Attachment

Patterns of attachment have been proposed based on individuals' models of self and other. Through a survey of adult romantic relationships, Hazan and Shaver (1987) identified three adult attachment styles which corresponded with infant attachment styles previously identified by Ainsworth et al., (1978): secure, insecure-avoidant, and insecure-anxious/ambivalent. Bartholomew (1990) and Bartholomew and Horowitz (1991) expanded on these hypothesized attachment styles, proposing that in order to understand adult attachment, one must consider how one views oneself and others. They proposed that two dimensions underlie adult attachment patterns: positive and negative view of self and positive and negative view of others. Combinations of these two dimensions give rise to four attachment patterns: secure, preoccupied, dismissing, and fearful. Bartholomew suggested that although a single avoidant category may be sufficient to describe attachment relationships in infancy and childhood, it may obscure different avoidant

patterns in adults. The dismissing and fearful patterns both reflect avoidant attachment.

In Bartholomew's (1990) typology, s*ecure* individuals are seen as having a positive view of both themselves and of others, as having high self-esteem, and being comfortable with intimacy and trusting of others. Individuals classified as *preoccupied* have a negative view of themselves, but a positive view of others. Desiring very close relationships with others, preoccupied individuals tend to be overly dependent, lack self-confidence, and seek constant validation from others. *Dismissing* individuals have a positive view of themselves and a negative view of others. These self-reliant individuals tend to be independent and achievement-oriented. They tend not to trust others and are uncomfortable with intimate relationships. Conversely, *fearful* individuals have a negative view of themselves and of others and, although they desire intimate relationships, they fear rejection. Those classified as fearful tend to be shy, have low-self-esteem, and seek the approval of others.

The Relationship Questionnaire (Bartholomew & Horowitz, 1991) was developed based on the above typology. Respondents rate the degree to which each of the four descriptions reflect their feelings about close relationships. Several studies have supported this four-category model. Bartholomew and Horowitz found that individuals with negative models of self, represented by fearful and preoccupied attachment styles, reported lower self-concept than those with positive models of self (secure and dismissing styles). Further, individuals classified as secure and preoccupied (positive models of others) had higher sociability and lower interpersonal problems compared to those with negative models of others (dismissing and fearful styles). In an examination

of interpersonal problems and theorized attachment styles, Horowitz, Rosenberg, and Bartholomew (1993) found that individuals classified as secure were more nurturing in interpersonal relationships; those classified as preoccupied were more intrusive, fearful individuals reported more interpersonal difficulties with social inhibition and unassertiveness, and dismissing individuals reported coldness and hostility towards others.

Although the categorization of adults into specific attachment patterns provides continuity with the infant attachment literature, Collins and Read (1990) argued that dimensional measures of attachment more adequately describe internal working models and attachment cognitions than instruments that render categorical typologies of distinct attachment styles. Furthermore, continuous scales yield more power for analyses.

Attachment and Regulation of Emotion

Kobak and Sceery (1988) conceptualized attachment as a theory of affect regulation. They posit that internal working models and different patterns of attachment provide an individual with rules which guide how one reacts to situations that are emotionally distressing or challenging. Internal working models or cognitive templates develop over time as children learn to predict how their caregivers will react in response to their attachment behaviours. When attachment figures are responsive to children's behavioural signals that seek comfort and support, children's emotional distress may be appropriately regulated. However, if caregivers are rejecting or inconsistent to children's attachment behaviours, children will necessarily develop alternative strategies to cope with distress and regulate their negative emotions (Kobak & Sceery).

In a distressing situation an individual with a secure internal working model would acknowledge the difficulty and draw support from significant others (Kobak & Sceery, 1988). For individuals with an insecure model of relationships, negative emotions are often either exaggerated to elicit a response from the attachment figure or inhibited to reduce anxiety associated with the attachment figures' unresponsiveness (Cassidy & Kobak, 1987). Those with avoidant working models may be unable to fully acknowledge the emotionally challenging situation and avoid seeking support and comfort. An ambivalent or preoccupied attachment pattern is organized by rules which focus attention towards the emotional distress and cause the individual to cling to his/her attachment figure in a hypervigilant manner, thereby inhibiting the development of autonomy or self-confidence (Kobak & Sceery, 1988).

Control Theory Analysis

Kobak, Cole, Ferenz-Gillies, Fleming, and Gamble (1993) developed a control theory analysis to explain the relationship between an individual's internal working model and the development of attachment strategies that regulate emotion. When an individual perceives a discrepancy between the actual and desired availability of an attachment figure, he/she will engage in strategies to reduce this discrepancy based on his/her internal working model. Those with a secure strategy believe that their attempts to re-establish contact with their caregiver will be successful. When an individual's attachment system is activated (i.e., when faced with a fearful event such as separation), the system will deactivate once proximity is attained through the availability of the attachment figure. The child may then effectively explore the world while using the

parent as a secure base. This is considered a primary strategy because the individual may effectively gain proximity and then move on to other matters or activities.

Secondary strategies follow when the child predicts that the attachment figure will be unavailable, insensitive, or unresponsive (Cole-Detke & Kobak, 1996). The child's attachment system remains activated and consequently the individual will need to not only monitor the attachment figure's availability, but also develop strategies to regulate their attachment behaviour and affect. Two secondary strategies emerging from the control systems perspective include *deactivation* and *hyperactivation*. The chosen strategy will depend on the child's internal working model of how the attachment figure will respond. If the child predicts that the attachment figure will act in a rejecting manner, employing a deactivation strategy may minimize conflict with the attachment figure (Chen & Mallinckrodt, 2002; Kobak et al., 1993).

Deactivation involves the regulation of affect and cognitions by diverting attention from stimuli that causes distress, and from the emotions and cognitions associated with the attachment relationship (Chen & Mallinckrodt, 2002). This type of strategy coincides with the avoidant or fearful attachment patterns described above. Alternatively, a hyperactivating strategy may be used if one predicts that the attachment figure will respond inconsistently. This strategy is characterized by continuous monitoring of the attachment figure for signs of potential abandonment and behaviours aimed at maintaining proximity and obtaining comfort from the attachment figures (Chen & Mallinckrodt, 2002; Kobak et al., 1993). With respect to attachment categorization, this type of individual would be classified as anxious/ambivalent or preoccupied.

The attachment system continually monitors the caregiver's availability. When an individual perceives a discrepancy between the desired and actual availability of the attachment figure, he/she will attempt to reduce this discrepancy. If the attachment figure is responsive to these strategies, the individual is able to coordinate attachment and exploration, and may return to exploration once a feeling of safety is attained. If the attachment figure is not responsive after an attempt at reducing the discrepancy, the individual assesses the working model of how the significant other will respond based on their past experiences. If the attachment figure has been inconsistent in the past, the individual may view this as hopeful and hyperactivate the attachment system through hypervigilance and exaggerated attachment. If the attachment figure has been rejecting in the past, the individual may determine that continued attempts to reduce the discrepancy would be in vain and move to deactivate attachment. This individual would avoid further proximity-seeking behaviours and shift focus away from the attachment figure and emotions associated with the relationship (Kobak et al., 1993).

Attachment and Psychopathology

The use of secondary attachment strategies has been linked to the development of psychopathology. Bowlby (1977) proposed that a causal relationship exists between individuals' early parental relationships and their ability to make affectional bonds later in life. Attachment theory, according to Bowlby, explains the "many forms of emotional distress and personality disturbance, including anxiety, anger, depression and emotional detachment, to which unwilling separation and loss give rise" (Bowlby, 1977, p. 201).

Internal working models are thought to account for the relationship between early

attachments and psychosocial functioning later in life that may act as protective or risk factors for later psychological functioning (Cummings & Cicchetti, 1990). There may be several different pathways by which insecure attachment influences psychological functioning, including self-esteem, affect regulation, and perfectionism. Davila, Hammen, Burge, Daley, and Paley (1996) found that low self-esteem mediated the relationship between attachment insecurity and poor interpersonal problem-solving. Laible, Carlo, and Roesch (2004) similarly found through structural equation modelling that parental attachment had a direct influence on self-esteem whereas the relationship between peer attachment and self-esteem was mediated by empathy and prosocial behaviour. Wilkinson (2004) conducted three independent studies to determine the relationships of parental attachment, peer attachment, and self-esteem to adolescent depression. Results from all three studies found that the relationship between parental and peer attachment and depression was mediated by self-esteem. Thus, there is some evidence to suggest that significant relationships are important to how adolescents then view themselves. For adolescents in Wilkinson's samples, this self-evaluation influenced depressive symptoms.

Affect regulation also plays a key role in how insecure internal working models influence psychopathology. As described above, when individuals believe that their attachment figure may or will not be available for them during times of distress, individuals will either increase attachment behaviours, or deactivate their attachment system and use other behaviours to regulate their negative affect. Both of these strategies to regulate negative affect may include behaviours considered to be unhealthy or

abnormal. For instance, in an examination of 60 adolescents hospitalized in psychiatric units, Rosenstein and Horowitz (1996) found those with a dismissing attachment style were more likely to have a conduct or substance-use disorder and narcissistic or antisocial personality disorder. Adolescents classified as preoccupied tended to have mood disorders and obsessive-compulsive, histrionic, borderline, or schizotypal personality disorder. In a nonclinical sample, Burge et al. (1997) found that parental attachment was associated with various psychological symptoms. High school women who felt trust towards their parents had fewer depressive symptoms, fewer eating disorder symptoms, and fewer symptoms of substance abuse. Those who did not feel alienated by their parents and felt that they had good communication with them had fewer depressive and eating disorder symptoms.

The drive for perfection has been theorized to be a means by which individuals cope with the inconsistency or unresponsiveness of attachment figures (Wie, Mallinckrodt, Russell, and Abraham, 2004). Children with anxious attachment may strive for perfection to earn their parents' love and acceptance. Those with avoidant attachment styles may strive for perfection to avoid rejection from others. The use of perfectionism may initially be adaptive where one desires to excel and sets high, but achievable personal goals. This strategy may become maladaptive when the personal goals become unrealistically high and when the individual perceives pressure from others to be perfect. Preliminary research has confirmed an association between insecure attachment and perfectionism. For example, in a sample of college students, Rice and Mirzadeh (2000) found that maladaptive perfectionism was associated with insecure attachment whereas

adaptive perfectionism was related to attachment security. Although not specifically attachment, Enns, Cox, and Clara (2002) found that relationship between harsh parenting (i.e., parental overprotection, criticalness, and lack of care) and depression was mediated by maladaptive perfectionism. Using structural equation modelling, Wei et al. found that the relationship between attachment anxiety and depressed mood was partially mediated by maladaptive perfectionism, while the relationship between attachment avoidance and depressed mood was fully mediated by maladaptive perfectionism.

To summarize, research has demonstrated a relationship between secondary attachment strategies and psychological functioning and has begun to examine the pathways by which insecure attachment is associated with mental health. Over the past couple of decades, attachment theory has been used to help gain a clearer understanding of relational factors associated with the development of disordered eating attitudes and behaviours (DEABs).

Secondary Attachment Strategies and Disordered Eating

The attachment system evaluates access to the caregiver and maintains a balance between maintaining proximity and exploring the world (Bowlby, 1982). It further allows the individual a means by which to regulate emotion. When faced with a distressing or fearful situation, the individual seeks comfort in his/her secure base. According to the control theory described above (Kobak et al., 1993), there are two types of secondary strategies that may be used to regulate emotions. The deactivation of the attachment system diverts attention away from the attachment figure, whereas hyperactivation increases attachment behaviours excessively in attempts to gain

proximity to the attachment figure. The use of these strategies may help elucidate the connection between attachment and disordered eating attitudes and behaviours (DEABs).

Attachment behaviours as proximity-seeking. As mentioned above, attachment behaviours may include any behaviour that results in an individual attaining or maintaining proximity to his/her significant other. According to Kobak et al. (1993), individuals who believe, based on their internal working models of others, that attachment behaviours may be successful in resolving the discrepancy between desired and actual availability, will intensify these behaviours until the desired emotional connection is attained. This hyperactivation of the attachment system is consistent with a preoccupied attachment pattern.

Orzolek-Kronner (2002) hypothesized that eating disorder symptomatology represents an attachment, proximity-seeking behaviour. The refusal to eat often results in the physical and psychological proximity of parent and child. She hypothesized that individuals with bulimia nervosa may possibly use bingeing and purging to attain and maintain proximity to parents. Bulimic behaviours often result in "following" behaviours by parents, monitoring for any signs of bingeing or purging. Thus, for individuals with eating disorder symptomatology, proximity-seeking behaviours may include food restriction, binge eating, self-induced vomiting, and abuse of laxatives. Orzolek-Kronner developed the Proximity Seeking Scale to measure both psychological and physical closeness in clinical populations. Psychological closeness is defined as "the individual's perception of her primary caregiver's availability to her" (Orzolek-Kronner, 2002, p. 427) and physical closeness is defined as "the presence or absence of certain behavioural

changes since the identified onset of the adolescent's psychiatric illness" (Orzolek-Kronner, 2002, p. 427). As no sample items were given and psychometrics on this instrument were minimal, it is difficult to evaluate the instrument. Orzolek-Kronner used this instrument to evaluate the degree of proximity-seeking behaviours in three different adolescent female groups; an eating disorder group, a clinical comparison group, and a nonclinical comparison group. Adolescents in the eating disorder group reported more proximity-seeking behaviours than the clinical or nonclinical comparison groups suggesting that symptoms associated with eating disorders may help adolescents gain proximity to their parents.

Brennan and Shaver (1995) studied attachment avoidance (deactivated attachment strategy) and anxious-ambivalence/preoccupied (hyperactivated attachment strategy) in romantic relationships with respect to affect regulation strategies, including DEABs. The authors found that the Drive for Thinness, Bulimia, and Body Dissatisfaction subscales of the Eating Disorder Inventory (Garder, Olmstead, & Polivy,1983) were most strongly associated with preoccupation in romantic relationships, lending support to Orzolek-Kronner's (2002) hypothesis that disordered eating represents proximity-seeking behaviour. Friedberg and Lyddon (1996) used Bartholomew's (1990) four-category typology to determine if attachment style could discriminate a clinical eating disorder group from a nonclinical comparison group. They found that preoccupied and secure attachment styles accurately predicted 75% of participants to either the clinical eating disorder group, or to the nonclinical group. Troisi, Massaroni, and Cuzzolaro (2005) found that relative to a comparison group, women with both anorexia nervosa and

bulimia nervosa reported higher scores on scales reflecting anxious/preoccupied attachment, but not on those reflecting an avoidant attachment style.

The above research supports the association between attachment preoccupation and DEABs. According to Kobak et al. (1993), individuals will intensify their attachment behaviours when it is believed that this will help gain proximity to their significant others, whether a parent or a romantic partner.

Disordered eating as attachment avoidance. Disordered eating may be viewed as a means by which negative emotions may be regulated when attachment figures are consistently unavailable. If one believes, based on her internal working model of others, that her attachment behaviours will not be successful in attaining comfort in times of distress, she may deactivate her attachment system (Kobak et al., 1993). Cole-Detke and Kobak (1996) sought to test this theory. They speculated that depressive symptoms (i.e., self-focus and rumination) represent an exaggeration of distress cues aimed at hyperactivating the attachment system. However, they hypothesized that symptoms of eating disorders actually divert attention away from attachment relationships (deactivation of attachment system) to dieting and one's appearance which may be perceived as a more attainable and controllable goal. Their results supported their hypothesis: In a sample of college women, those who reported higher scores on measures of both depression and disordered eating exhibited a hyperactivated attachment strategy. However, women who experienced only disordered eating and not depressive symptoms tended to employ a deactivated attachment system. These results suggest that symptoms of eating disorders do not represent an attempt to hyperactivate the attachment system as

Orzolek-Kronner (2002) hypothesized, but rather as a means by which focus may be diverted away from attachment relationships. Barone and Guiducci (2009) found similar results: Ninety percent of their clinical sample had an insecure attachment representation, with most women classified as dismissing which is a deactivating attachment strategy.

Other research in the area of attachment and DEABs has been less than conclusive with respect to the type of secondary strategy (i.e., avoidant/dismissive versus anxious/preoccupied) associated with DEABs and diagnosed eating disorders. Candelori and Ciocca (1998) found that women with restricting anorexia nervosa tended to be dismissive and those patients who exhibited bulimic behaviours within either anorexia nervosa or bulimia nervosa tended to be preoccupied. They further argued that dismissive strategies were more pathological than those displayed by the preoccupied group. Pierrehumbert et al. (2002) found that participants with eating disorders exhibited more hyperactivating strategies whereas those with substance dependence reported more deactivating strategies. However, they acknowledged that participants with eating disorders did exhibit some deactivating strategies as well.

In their review, O'Shaughnessy and Dallos (2009) speculated that methodological issues contribute to the inconclusive results of the above studies. Studies with larger samples tend to use self-report measures while those that use the 'gold standard' Adult Attachment Interview (AAI, George, Kaplan, & Main, 1985; George, Kaplan, & Main, 1996) have smaller sample sizes. Ringer and Crittenden (2007) attempted to overcome these issues by using the AAI with a larger sample. They examined the particular self-protective attachment strategies used by 62 women with eating disorders. Type A

strategies (i.e., compulsive caregiving and compliance) involve "inhibition of negative affect to prevent attachment figures' anger and are associated with actual threat or danger" (Ringer & Crittenden, p. 120). These strategies reflect the deactivation of one's attachment system and an avoidant attachment style. Type C strategies involve an "exaggerated display of feelings to coerce attachment figures into responding and are associated with uncertain expectation of threat or danger" (Ringer & Crittenden, p. 120). These strategies (i.e., aggressive and feigned helplessness) represent a hyperactivated attachment system and reflect the preoccupied attachment style. Although in general, participants with anorexia nervosa exhibited Type A attachment behaviours and those with bulimia nervosa showed Type C attachment behaviours, the classifications had considerable overlap. Further, 39% of participants with different types of eating disorders displayed both Type A and Type C behaviours. Thus, even though the authors addressed the deficiencies in previous research by using a larger sample and the 'gold standard' in attachment research, the relationship between attachment strategy and eating disorder subtype was not clarified.

The above research supports the association between attachment avoidance and disordered eating where women deactivate their attachment systems when they believe that their attempts to gain proximity to their significant others will be ineffective (Kobak et al., 1993). Diverting their attention away from significant others, women may engage in DEABs to modify their appearance, a more attainable and controllable goal.

As demonstrated by the research cited above, numerous studies have been conducted examining the relationship between attachment and DEABs. Three reviews

conducted between 1996 and 2009[1] examined empirical and theoretical literature to determine what conclusions could be made about the relationship between attachment and DEABs to recommend direction for further study.

O'Kearney (1996) concluded that despite the difficulties with the measurement of attachment in the studies included in his review, there was evidence to suggest a relationship between attachment disruption and DEABs. He noted that it is important to examine the processes through which attachment is involved in the development and maintenance of DEABs. Hypotheses stemming from attachment theory and research such as affect regulation, regulation of self-esteem, social judgement, and interpersonal competencies could be evaluated to expand understanding of the relationship between attachment and DEABs.

Ward, Ramsay, and Treasure (2000) similarly found in their review of the literature that insecure attachment was common in females with eating disorders. They noted that while some studies may have found associations between attachment style and eating disorder diagnostic subgroups, results were inconclusive. The authors concluded that future research should focus on specific aspects of attachment rather than attachment style.

O'Shaughnessy and Dallos (2009) reviewed literature to examine the relationship between attachment and anorexia nervosa specifically, and to examine the method by which attachment research has been conducted. As concluded by Ward et al. (2000), no firm conclusions could be made with respect to attachment style and eating disorder

[1] Data collection and analysis for Study 1 was conducted prior to 2010 and thus research reported in Study 1 reflects the literature published at that time.

subtype. It was suggested that it may be more helpful to consider level of disordered eating symptoms rather than diagnoses. This was echoed Broberg, Hjalmers, and Novonen (2001) and Troisi, Massaroni, and Cuzzolaro (2005) who argued that eating disorder diagnostic subtype may have little bearing on type of insecure attachment strategy and that severity of eating disorder symptoms would be more fruitful in exploration of the attachment connection.

Disordered Eating and Parental Attachment

Research has consistently demonstrated an overrepresentation of insecure attachment among those with disordered eating attitudes and behaviours. However, research on the relationship between parental attachment and disordered eating is sparse. Kenny and Hart (1992) found that those women in a nonclinical college sample who were more likely to describe their parental attachment relationships as secure also reported lower levels of bulimic behaviours, preoccupation with diet and weight, and feelings of ineffectiveness on the Eating Disorder Inventory-2 (EDI-2, Garner, 1991) when compared to an inpatient sample of women diagnosed with eating disorders. Further, canonical analysis for the combined sample revealed that parental relationships characterized by positive affect, emotional support, and the fostering of autonomy were negatively associated with weight preoccupation, bulimic behaviour, and feelings of ineffectiveness.

Calam, Waller, Slade, and Newton (1990) compared women with anorexia nervosa and bulimia nervosa to a nonclinical sample to determine the relationship between eating disorders and the women's perception of relationships with their parents.

Women with eating disorders remembered both their mothers and fathers as low in caring, and their fathers as overprotective on the Parental Bonding Instrument (PBI, Parker, Tupling, & Brown, 1979). According to the authors of the PBI, low care is associated with emotional coldness, indifference, rejection, and neglect. Similarly, Bulik, Sullivan, Fear, and Pickering (2000) interviewed women who had been referred for treatment of anorexia nervosa an average of 12 years earlier to explore variables that would possibly distinguish women at different points of recovery. They found that women who continued to meet criteria for anorexia nervosa at the time of their interview (chronically ill group) reported significantly lower maternal care scores on the PBI than women who were partially recovered, recovered, or women in the nonclinical comparison group. The chronically ill group further reported lower paternal care scores than the fully recovered and nonclinical comparison groups.

Latzer, Hochdorf, Bachar, and Canetti (2002) studied the association between attachment, family environment, and eating disorders in a sample of women diagnosed with either anorexia nervosa or bulimia nervosa. Results showed that the avoidant attachment style was most often reported by women with eating disorders, whereas women in the nonclinical comparison group most often reported a secure attachment style. Furthermore, logistic regression analyses revealed that anxious/ambivalent and avoidant attachment styles significantly predicted eating disorders. Family environmental factors were also examined; however, when attachment style was controlled, differences in family environment disappeared. This result in particular led the authors to conclude that attachment style may be a "primary differentiating factor in

the etiology of ED [eating disorder]" (Latzer et al., 2002, p. 593). Additionally, they suggested that family environmental variables may be "insufficient in themselves to the understanding of ED, but more informative when used in combination with measures of attachment" (p. 593).

The role of parental attachment in the development of adolescent girls' eating pathology has not been widely studied. The role of fathers in particular has received less research attention (O'Shaughnessy & Dallos, 2009). McVey, Pepler, Davis, Flett and Abdolell (2002) examined conditional parental support and parental involvement as potential risk and protective factors associated with disordered eating in young adolescents in grades 7 and 8 (M = 12.9 years). They found that greater disordered eating was associated with lower paternal support. Paternal support further moderated the relationship between negative school-related events and disordered eating, suggesting that unconditional paternal support may reduce the impact of stress associated with school. Similarly, Cole-Detke and Kobak (1996) found that women who reported eating disorders also reported poor paternal relationships in which their fathers were both emotionally unavailable and highly critical. Swarr and Richards (1996) found that adolescent females' relationships with their fathers were associated with weight and eating concerns. In particular, girls who spent more time with their fathers had healthier (lower) scores on measures of eating pathology, especially when these girls perceived their pubertal development as early.

The Pathways Between Attachment and Disordered Eating

To further examine the relationship between attachment and DEABs, it is

necessary to examine possible pathways by which attachment and disordered eating are related. Research has begun to explore possible mediating mechanisms. In a sample of women seeking treatment for an eating disorder, Tasca et al. (2006) found that negative affect and body dissatisfaction mediated the relationship between attachment insecurity and eating disorder symptoms. Eggert, Levendosky, and Klump (2007) hypothesized that personality, specifically neuroticism and extraversion, would mediate the relationship between attachment and disordered eating in a nonclinical sample. Initial analyses between attachment, personality, and disordered eating variables showed that the strongest and most consistent relationships were found with resistant (preoccupied) attachment. Mediation analyses using resistant attachment to predict DEABs revealed that neuroticism mediated the relationship between resistant attachment style and disordered eating as well as the relationship between resistant attachment and body dissatisfaction, weight preoccupation, and binge eating.

As discussed above, low self-esteem, negative affect, and perfectionism are associated with attachment insecurity. However, only negative affect (Tasca et al., 2006) has been examined as a possible mediating variable between attachment and disordered eating.[2] While associated with insecure attachment, perfectionism has also been linked to DEABs. McVey et al. (2002) examined risk and protective factors associated with

[2] Subsequent to the collection and analysis of data for the current study, other studies examining potential mediating variables were published. Tasca et al. (2009) examined affect regulation strategies as potentially mediating the relationship between attachment and eating disorder symptoms. Shanmugan, Jowett & Meyer (2012) assessed the indirect effect of self-esteem, perfectionism, and depression on the relationship between attachment style and eating psychopathology in athletes. Ty & Francis (2013) examined social comparison and emotion dysregulation as potential mediators in the relationship between attachment at DEABs. Results from these studies will be discussed in relation to those of the current study in the Discussion section.

DEABs in young adolescent females. With respect to perfectionism, the researchers tested both personal and social trait levels of perfectionism. They found that high self-oriented perfectionism, the tendency to expect perfection from oneself and to strive to attain perfection (Hewitt & Flett, 1991), was associated with disordered eating. Socially prescribed perfectionism, the view that others demand perfection, however was not. In a meta-analytic review of risk and maintenance factors for eating pathology, Stice (2002) concluded that both negative affect and perfectionism are risk factors for eating pathology.

Research cites two main components of perfectionism. These include trait perfectionism, the need to *be* perfect; and perfectionistic self-presentation, the need to *appear* perfect (McGee, Hewitt, Sherry, Parkin & Flett, 2005). Hewitt et al. (2003) describe three facets of perfectionistic self-presentation: perfectionistic self-promotion, the nondisclosure of imperfection, and nondisplay of imperfection. Perfectionistic self-promotion involves one's need to present oneself as perfect, emphasizing strengths, successes, and achievements to others. The remaining two facets involve the concealment of imperfections. The nondisclosure of imperfection reflects one's reluctance to verbally acknowledge personal flaws whereas the nondisplay of imperfection involves the avoidance of situations in which one may behave in a less-than-perfect manner.

Research has established a positive correlation between the dimensions of perfectionistic self-presentation and eating disorder symptomatology (Cockell, et al., 2002; Hewitt, Flett, & Ediger, 1995; McGee et al., 2005). Specifically, in a sample of

female university students, Hewitt, Flett, and Ediger found that each of the three facets of perfectionistic self-presentation were associated with eating disorder symptoms and shape and weight concerns. In a clinical sample, Cockell et al. found that compared to psychiatric and nonclinical control groups, women diagnosed with anorexia had higher scores on all the perfectionistic self-presentation dimensions. Finally, in a sample of nonclinical university students, McGee et al. found that each of the facets of perfectionistic self-presentation were associated with eating disorder symptoms. Further, perfectionistic self-presentation dimensions predicted symptoms of disordered eating in women with great body dissatisfaction, but not in women who liked their bodies and perceived little or no difference between their actual and ideal appearance.

As with perfectionism, research has also established a connection between self-esteem and both attachment and disordered eating. There is an extensive body of research linking self-esteem with disordered eating. For example, Peck and Lightsey (2008) found that increasing severity of disordered eating symptoms was associated with decreased self-esteem and increased perfectionism. Shea and Pritchard (2007) found that self-esteem was the second strongest predictor, after escape/avoidance coping, for bulimia nervosa, drive for thinness, and body dissatisfaction.

Given their individual associations with both attachment and symptoms of disordered eating, the examination of the mediating effects of self-esteem and perfectionism on this relationship is warranted. Research has examined either adult attachment or parental attachment alone, but no study to my knowledge has investigated the relationship between attachment and disordered eating simultaneously using both

parental attachment and adult attachment style. The combination of these relationships may help clarify the connection between attachment and disordered eating. The examination of variables associated with both attachment and disordered eating will further enhance our understanding of this relationship.

Study 1

Research to date has shown a consistent connection between insecure attachment and disordered eating (O'Shaughnessy & Dallos, 2009; O'Kearney, 1996; Ward et al., 2000). However, the type of secondary attachment strategy used by females with disordered eating has not yet been clearly identified. The use of either a deactivated attachment strategy (avoidant or dismissing attachment style) or a hyperactivated attachment strategy (anxious or preoccupied attachment style) could potentially lead to disordered eating behaviours. It has further been suggested that eating disorder subtype (i.e., anorexia nervosa, bulimia nervosa, binge eating disorder) may have little bearing on type of insecure attachment strategy (Broberg Hjalmers, & Nevonen, 2001; Troisi, Massaroni, & Cuzzolaro, 2005).

Although adult attachment strategies have been considered in the understanding of disordered eating, the consideration of both adult attachment strategies and parental attachment has received little attention. Figure 1 outlines the hypothesized process by which females' perceptions of their parental relationships may be associated with their degree of attachment insecurity in their current relationships. Attachment insecurity may then be associated with current disordered eating attitudes and behaviours (DEABs), specifically through negative self-esteem, affect, and perfectionistic self-presentation.

The purpose of the current study was to investigate the process by which parental attachment and adult attachment style are associated with DEABs. As discussed above, disordered eating may be theoretically viewed as an attachment behaviour used to attain proximity to significant others (Orzolek-Kronner, 2002) or as a means by which females divert their attention away from relationships with significant others (Cole-Detke & Kobak, 1996) when they have been consistently unsuccessful in having their needs met. Research has established a link between both types of insecure attachment and eating pathology (O'Kearney, 1996; O'Shaughnessy & Dallos, 2009; Ward et al., 2000). Further work (Tasca et al., 2006) has begun to investigate indirect effects; that is, possible mediating variables.

A goal of the current study was to extend the literature by establishing relationships among secondary attachment strategy, DEABs, self-esteem, negative affect, and perfectionistic self-presentation and to then test the indirect effect of negative affect, self-esteem, and perfectionistic self-presentation on the relationship between secondary attachment strategy and disordered eating. The following hypotheses were postulated:

Hypothesis 1. Both anxious and avoidant attachment styles will be positively correlated with disordered eating attitudes and behaviours (i.e., eating restraint, concern over eating, weight, and shape). Lower self-esteem, greater negative affect and higher perfectionistic self-presentation will be significantly associated with greater attachment anxiety and avoidance and higher levels of disordered eating attitudes and behaviours.

Hypothesis 2. Lower self-esteem, negative affect, and perfectionistic self-presentation will mediate the relationship between secondary attachment strategy and

overall disordered eating.

Hypothesis 3. As the current research posits that parental attachment is associated with the deactivation or hyperactivation of one's attachment system, the current study sought to establish a connection between parental attachment and secondary attachment style. It was thus hypothesized that greater avoidant and anxious attachment would be associated with less communication and trust and greater feelings of alienation with both mothers and fathers.

Hypothesis 4. Both maternal and paternal attachment will significantly predict anxious and avoidant attachment styles.

Method

Measures.

Inventory of Parent and Peer Attachment (IPPA). The IPPA (Armsden & Greenberg, 1987, 2009) was used to determine the quality of the participants' attachment relationships with their mothers and fathers (see Appendix A). Designed to measure the affective and cognitive dimensions of attachment, the IPPA assesses individuals' perceived security in their relationships with parents and peers on a 5-point scale ranging from 1 (*almost never or never true*) to 5 (*almost always or always true*). The original 1987 version of the scale contains 28 parent and 25 peer items yielding two attachment scales, one for attachment to parents and one for attachment to peers. The authors subsequently modified the instrument to assess mother, father, and peer attachment separately with 25 items used for each scale. Both the original and modified versions of the scales yield three attachment subscales: degree of mutual trust (Trust, i.e., "My

parents accept me as I am."), quality of communication (Communication; i.e., "I tell my father about my problems and troubles."), and extent of anger and alienation (Alienation; "I get upset easily around my mother."). The current study used the modified version of the scale where participants were asked to complete the questionnaire separately with respect to their mother/step-mother and to their father/step-father. Participants did not complete the peer version of the inventory as it was not relevant to the purposes of the study. Scores for the subscales of IPPA mother (IPPA-M) and the IPPA father (IPPA-F) were obtained as outlined by the authors. For the original version of the scale, Davila et al. (1996) report internal consistencies (Cronbach's alpha) of .89 (Communication), .91 (Trust), and .82 (Alienation). For the revised version, Armsden and Greenberg (2009) report internal consistencies of .87 for the IPPA-M and .89 for the IPPA-F (total scores). With respect to convergent validity, Armsden and Greenberg (1989) found that parental attachment scores (original version) were significantly correlated with five of six indices on the Family Environmental Scale (Moos & Moos, 1983). The highest correlations were found with the Cohesion (r = .56) and Expressiveness (r = .52) subscales. Family and Social Self-Concept scores from the Tennessee Self Concept Scale (Fitts, 1965) were also significantly associated with parental attachment. Correlation coefficients were .78 and .46, respectively.

Attachment Style Questionnaire (ASQ). The ASQ (Feeney, Noller, & Hanrahan, 1994), located in Appendix B, is a 40-item self-report questionnaire that utilizes a 6-point scale where responses range from 1 (*totally disagree*) to 6 (*totally agree*). The original instrument is scored as five subscales; one measures secure attachment (Confidence in

Relationships), two measure aspects of avoidant attachment (Relationships as Secondary and Discomfort with Closeness) and two measure anxious or preoccupied attachment (Preoccupied and Need for Approval). The authors report that coefficient alphas for the five subscales range from .76 to .84. With respect to test-retest reliability, coefficients range from .67 to .78. The current study used an alternative two-dimensional scoring method employed by Tasca et al. (2006) and Alexander, Feeney, Hohaus and Noller (2001) which yielded two insecure subscales: Anxious Attachment (AN-A) and Avoidant Attachment (AV-A). The AV-A scale has 16 items (possible range 16–96), and the AN-A scale has 13 items (possible range 13–78) (J. Feeney, November 25, 2009, personal communication). In the Study 1 sample, coefficient alpha for the AV-A subscale was .85, and coefficient alpha for the AN-A subscale was .87. The internal consistencies for both subscales are similar to those reported by Tasca et al. (.76 and .85 for AV-A and AN-A subscales, respectively) and Alexander et al. (.86 for both subscales). The Pearson correlation coefficient between these two subscales was, $r = .55$, $p < .001$ in Study 1. Given the overlapping nature of these two subscales, an Overall Insecure Attachment (IN-A) score was computed by summing items from both the AV-A and AN-A subscales in the current study. Higher scores on IN-A represent greater insecure attachment. The coefficient alpha for this total score was .90.

Eating Disorder Examination Questionnaire (EDE-Q). The EDE-Q (Fairburn & Cooper, 1993) served as the dependent measure (Appendix C). The EDE-Q is 42-item self-report instrument. Thirty-six of these items yield four subscale scores and a global score, each summed over their respective items. The subscales include Restraint, Eating

Concern, Shape Concern, and Weight Concern. Participants are asked to rate the frequency of their eating behaviours (i.e., "how many days out of the past 28 days have you tried to not eat any of the foods you liked to control your weight and shape?") and their attitudes towards their weight and shape (i.e., "over the past 28 days how unhappy have you felt about your weight?"). To calculate the Global score, the current study used the total of the four subscales rather than the average. This less conventional method was used to facilitate the interpretation of the multiple mediation analyses more fully described in the Results section. The reported Global score in Table 1 may be converted to the more conventionally scored Global score by dividing by 22. The EDE-Q has demonstrated internal consistency (Cronbach's alpha = .78-.93) and 2-week test-retest reliability (.81-.92) for the four subscales of the instrument (Luce & Crowther, 1999). Mond, Hay, Rodgers, Owen, and Beumont (2004) found that the EDE-Q demonstrated concurrent validity when compared to the interview version of the instrument.

Rosenberg Self-Esteem Scale (RSES). The RSES (Rosenberg, 1965) is a 10-item self-report instrument designed to measure global self-esteem (Appendix D). The RSES is rated on a 4-point scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*).This widely used instrument has demonstrated internal consistency (.92) and studies of 2-week test-retest reliability yielded correlations of .85 and .88, demonstrating its stability. The RSES has been shown to demonstrate acceptable levels of reliability for Canadian adolescents. Internal consistency for Canadian females was .89 and .86 for males (Bagley, Bolitho, & Bertrand, 1997).

Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clarke,

& Tellegen, 1988) (Appendix E) was used to measure participants' affect. The PANAS is comprised of two 10-item self-report mood subscales, Positive Affect (PA) and Negative Affect (NA). Participants rate the extent to which they have experienced the listed feelings and emotions over the past few weeks on a 5-point scale ranging from 1 (*very slightly*) to 5 (*extremely*). Authors report that the subscales are internally consistent and acceptably stable over a 2-month time frame. Cronbach's alpha for the PA and NA subscales range from .83 to .90 and .84 to .93, respectively. The PANAS has demonstrated convergent and discriminant validity with the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). The NA subscale was the only one used for analyses in the current study.

Perfectionistic Self-Presentation Scale (PSPS). The PSPS (Hewitt et al., 2002) is a 27-item self-report instrument (Appendix F) that taps three dimensions of Perfectionistic Self-Presentation; Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection. Higher scores on each of the subscales reflect greater perfectionistic self-presentation. Research conducted by Hewitt et al. (2003) with seven different samples (university students, clinical, community) supports the reliability and validity of the instrument. Coefficient alphas ranged from .86 to .89 for Perfectionistic Self-Promotion; from .83 to .91 for Nondisplay of Imperfection; and from .76 to .88 for Nondisclosure of Imperfection. To determine if the factor structure of the subscales held for each of the samples, coefficients of congruence were calculated. A high degree of congruence was demonstrated between the clinical and student samples

and between the clinical and community samples. Test-retest reliability over a 3-week period was .83, .84, and .74 for the Perfectionistic Self-Promotion, Nondisplay of Imperfection and the Nondisclosure of Imperfection subscales, respectively. Each of the subscales on the PSPS were significantly correlated with subscales on the Mulidimensional Perfectionism Scale (Hewitt et al., 2003).

Procedure

Participant recruitment. Participants were primarily recruited from undergraduate Psychology courses at Lakehead University and Grade 9 and 10 Physical Education classes at a high school, both located in Thunder Bay, Ontario. University students received one bonus point for participation in the current study. No incentive was offered to the high school students. High school participants were recruited through their participation in the Turning Points for Teens Program, a larger study funded by the Ontario Ministry of Healthy and Long-Term Care from the Health Canada Primary Care Health Transition Fund. The purpose of the larger study, entitled "Turning Points for Teens: Community-Based Interventions for Disordered Eating Attitudes and Behaviours", hereafter referred to as "Turning Points", was to develop and pilot test an intervention program designed to promote healthy lifestyle choices with respect to eating attitudes and behaviours, exercise, body image, emotion regulation, and interpersonal relationships with parents, peers, and romantic partners. The data collection was associated with the third phase of Turning Points. In Phase 3, the video-based targeted intervention developed during Phase 2 was conducted at several data collection sites. The current study used the Time 1 data obtained prior to completion of the Turning

Points program in the Thunder Bay high school.

Data collection. Data collection was completed from March through May 2006 with a co-researcher completing her Master's thesis in Clinical Psychology. Professors teaching undergraduate Psychology courses were approached by the co-researcher regarding the possibility of speaking to their classes to recruit participants. Psychology classes of professors who agreed to allow researchers to recruit from their classes were visited by one or both of the researchers. Students were informed that the purpose of the research was to learn more about the interpersonal and emotional factors that influence disordered eating attitudes and behaviours. Potential participants were told that it would take approximately 45 minutes to 1 hour to complete the questionnaire package and were encouraged to answer all questions as honestly as they could. The questionnaires used for the current study were arranged in the booklet in the following order: EDE-Q, PANAS, RSES, IPPA-M, IPPA-F, ASQ, and PSPS. The researcher(s) told students that their participation was voluntary and that they could withdraw at any point without penalty. Anonymity was assured. Interested students were given participant information letters (Appendix G) consent forms (Appendix H) and questionnaire packages to be completed on their own time. Completed questionnaire packages were returned to the mailroom in the Department of Psychology at Lakehead University where they were collected daily by one of the researchers. Upon collection, consent forms were separated from completed questionnaires. Professors were given the names of those individuals who participated in the research so participation points could be awarded.

Approval was obtained from the Thunder Bay Catholic District School Board

after a teacher at a local high school in the school board expressed interest in implementing the Turning Points program as a Health unit for three female Physical Education classes. Parental consent was required for students to complete the research instruments. The parental information letters (Appendix I) and consent forms (Appendix J) were sent home with the students and the consent forms were returned to the class teachers who collected them and returned them to the two researchers. Researchers visited each of the three classes to discuss and answer questions regarding the research component of the program. As with the university students, high school students were informed about the purpose of the research. Participant information letters (Appendix K) and consent forms (Appendix L) were reviewed and completed during class time prior to the completion of research instruments. Participants completed the research instruments during class time. Participants were asked to refrain from discussing their answers with their peers and they were encouraged to answer all questions as honestly as they could. Students were told that their participation in the research component was voluntary and that they could withdraw at any point without penalty. Anonymity was assured.

All participants were assigned an alphanumeric code to maintain confidentiality and anonymity on all research instruments. Consent forms were stored separately from completed questionnaire packages at Lakehead University.

Results

Data management. Data was examined for outliers, defined as cases with a *z* score of +/- 3.29. Nine participants were identified as outliers for age 41-51 years and were removed from analyses. For identified outliers on all other variables, the original

raw score was replaced by the corresponding highest or lowest nonoutlier value plus one following the convention of Tabachnick and Fidell (2001). In the entire data set, a total of 13 values were adjusted using this method. To be included in the analyses, a minimum of 80% of items per psychometric variable were required. When this criterion was met, a mean subscale score was calculated for each individual and used to replace the missing item. The number of items replaced on each subscale is included in Table 1. The number of replaced items ranged from 2 to 26 across the different instruments and their subscales.

Analytic strategy. The results of Study 1 are presented as follows. First, variables were explored for internal consistency using Cronbach's alpha. Next, Pearson product-moment correlation coefficients were calculated between all variables to produce an intercorrelational matrix. Third, using Preacher and Hayes (2008) bootstrapping method for multiple mediator models, three mediation models were tested to determine the effect of Anxious, Avoidant, and Overall Insecure Attachment on DEABs (EDE-Q Global) through Negative Affect (NA), self-esteem (RSES), and Perfectionistic Self-Presentation (PSPS). Finally, hierarchical multiple regression was used to test the prediction of Anxious, Avoidant, and Overall Insecure Attachment from the parental attachment variables (IPPA).

Participants. Participants in the current study included 281 females, ages 14-40 years with a $M = 19.29$ years ($SD = 4.56$). Participants were primarily recruited from undergraduate Psychology courses at Lakehead University ($n = 196$) and Grade 9 and 10 Physical Education classes at a high school ($n = 61$), both located in Thunder Bay,

Ontario. Other participants (n = 24) were recruited through their participation in the Turning Points for Teens Program. Canadian-born participants made up 96.4% of the sample. With respect to living status, 60.6% of participants lived with their parents or grandparents. Ten percent of participants lived with a partner or spouse. Those living with a roommate or in residence made up an additional 22.7% of the sample. Four (1.4%) participants lived with only their children, 7 (2.5%) lived alone, and 7 (2.5%) had a different living arrangement. Four participants declined to report their living status.

Psychometric properties of the variables. Indices of internal consistency (Cronbach's alpha coefficients) and descriptive statistics were computed for all subscales (see Table 1). The number of participants with complete data ranges from 268 to 281. The subscales reflecting the lower sample size include those measuring the paternal attachment relationship (IPPA-F). This measure was placed in the questionnaire package immediately following the one assessing the maternal attachment relationship. Anecdotal evidence suggests that some participants did not complete this measure either because they did not have a father-figure in their lives or because they assumed it was a duplicate measure and thus only completed the maternal attachment instrument. It would appear that all subscales possess satisfactory levels of internal consistency which range from .80 to .96.

Preliminary analyses. Prior to conducting the main mediation analyses, linear associations among the variables were tested by computing Pearson product-moment correlation coefficients (see Table 2). Figure 2a illustrates a direct effect model of X on Y. In the current study, X is attachment measured on the ASQ and Y is DEABs measured

on the EDE-Q. Hypothesis 1 stated that both Anxious Attachment and Avoidant Attachment would be positively correlated with DEABs. Indeed, the subscales from both the ASQ and the EDE-Q were all significantly correlated with each other, *r*s range from .27 - .88 (Table 2). Before testing the *a* and *b* paths in the mediation model illustrated in Figure 2b, the correlation coefficients between the hypothesized mediator variables and both the independent and dependent variables were computed. Hypothesis 1 further predicted that each of the mediators (*M*) involving lower self-esteem (RSES), higher negative affect (PANAS-NA), and higher Perfectionistic Self-Presentation (PSPS) would be significantly correlated with higher Anxious Attachment (*X*), Avoidant Attachment (*X*), and EDE-Q Global (*Y*). These correlations were also significant and in the predicted directions, *r*s range from .36 - .66. Thus, hypothesis 1 was supported.

Multiple mediation analysis. Hypothesis 2 posited that lower self-esteem (RSES), Negative Affect (PANAS-NA), and Perfectionistic Self-Presentation (PSPS) would mediate the relationship between secondary attachment strategy (Anxious or Avoidant Attachment) and overall disordered eating. To test this hypothesis, the multiple mediation analysis procedure outlined by Preacher and Hayes (2008) was used. These authors point out several advantages of testing a multiple mediation model rather than separate single univariate models. First, the use of a multiple mediation model enables the testing of the overall indirect effect of the independent variable (*X*) on the dependant variable (*Y*). This is similar to performing a regression analysis with multiple predictors to determine whether an overall effect exists. If the overall indirect effect is significant, one may conclude that the set of variables mediate the effect of *X* on *Y*. Furthermore, it is

possible to determine the unique mediating effect of each of the variables included in the model. Specifically, it is possible to pit one variable against another to determine the extent to which one variable mediates the relationship relative to another mediator. For example, in the current study, one is able to determine whether there is a difference in the extent to which Negative Affect, Perfectionistic Self-Presentation, and low self-esteem mediate the relationship between attachment and DEABs.

The use of the Preacher and Hayes (2008) multiple mediation method eliminates problems found with other commonly used mediation methods. For example, the causal steps approach popularized by Baron and Kenny (1986) does not allow for the estimation of the indirect effect of *X* on *Y* through the mediating variable, but rather infers mediation based on whether several specific statistical criteria are met. Further, Fritz and MacKinnon (2007) report that the Baron and Kenny approach is among the lowest in power. Therefore, if *X*'s effect on *Y* is mediated by another variable, *M*, the causal-steps method would be among the least likely to detect such an effect (Hayes, 2009). An alternative method for testing mediating effects is the product-of-coefficients approach, commonly known as the Sobel (1982) method. The difficulty with this method is that it assumes multivariate normality. This is problematic as the sampling distribution of *ab* product of coefficients is only normal in large samples (Preacher & Hayes).

The current study used the INDIRECT SPSS macro for multiple mediation developed by Preacher and Hayes (2008). This procedure uses a nonparametric resampling technique known as bootstrapping (Hayes, 2009). Bootstrapping eliminates the need for data to be normally distributed as it generates an empirical approximation of

the sampling distribution for the indirect effect. During the analysis, the sample size *n* is repeatedly resampled *k* number of times. As a minimum of 5,000 times is recommended by Hayes, this frequency of resampling was used in the present study. Once the resampling has been completed, *k* estimates of the indirect effect (*ab*) are ordered from smallest to largest and confidence intervals are generated to determine the size of the indirect effect. Although any percent confidence interval may be used, the customary 95% confidence interval (CI) was used in the current study. With a percentile-based bootstrap 95% CI, the lower bound in the set would be defined as k $(.5\text{-}95/200)^{th}$ ordinal position in the list. If $k = 5{,}000$, then the lower bound would be the value at the 125^{th} ordinal position. The upper bound is the value at $1+ k$ $(.5 + 95/200)^{th}$ ordinal position. So, when $k = 5{,}000$, the upper bound of the interval is the value at the $4{,}876^{th}$ ordinal position. According to Preacher and Hayes, percentile-based CIs may be improved by adjusting the end points to obtain a bias-corrected or a bias-corrected and accelerated confidence interval (Efron, 1987). In their simulation study, MacKinnon, Lockwood, and Williams (2004) concluded that "bias-corrected bootstrap provided the most accurate confidence limits and greatest statistical power, and is the method of choice if it is feasible to conduct resampling methods" (p. 125). Regardless of the type of confidence interval employed, if zero is not contained in the interval, it may be concluded that the obtained indirect effect is not zero with 95% confidence. Conceptually, this is similar to rejecting the null hypothesis that the indirect effect equals zero at the .05 significance level of probability.

To summarize, testing a multiple mediator model rather than several single mediator models allows one to test the overall indirect effect as well as the unique effects of the mediators separately and relative to each other. Furthermore, bootstrapping has more power to detect an effect than the Baron and Kenny (1986) casual-steps approach and it does not require a normally distributed sample. Therefore, the Preacher and Hayes (2008) bootstrapping procedure for multiple mediator models was used in the current study. Although bootstrapping is the preferred method according to Preacher and Hayes, the SPSS macro designed by these authors also calculates the Sobel test ("normal theory test") for the total and indirect effects as well as percentile-based, bias-corrected, and bias-corrected and accelerated confidence intervals (bootstrapping). When more than one potential mediator is entered, the program also computes Sobel and bootstrap tests to compare the potential mediators.

The macro computes the unstandardized regression coefficients (*B*) for the c path comprising the effect of *X* on Y, and the c′ path that determines the effect of *X* on Y when mediators are added to the model (Figure 2). As in any form of linear model, the scale of the *X* and *Y* variables influence the size of the unstandardized regression coefficients (A. Hayes, personal communication, December 14, 2009).

The scoring method outlined by the authors of the EDE-Q uses the mean of the four subscales to compute the Global score (range = .03-5.87). As the variance associated with this range is limited, the unstandardized coefficients would be small and more difficult to interpret. To increase the variance and thus facilitate the interpretation

of the unstandardized regression coeffiecients, the Global score was computed by summing the 22 items included in the four subscales.

In the current study, three separate mediation models were tested using the INDIRECT SPSS macro: one each for the independent variables of Avoidant Attachment (AV-A), Anxious Attachment (AN-A), and the summative combination of these two ASQ subscales, Overall Insecure Attachment (IN-A).

Model 1: Anxious Attachment. The first multiple mediator model tested the significance of the indirect effect of AN-A on DEABs (EDE-Q Global) through Negative Affect (PANAS-NA), self-esteem (RSES), and the PSPS variables: Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection. Normal theory test (Sobel) estimates and bootstrapping confidence intervals are included in Table 3. The Sobel test for AN-A model revealed that PANAS-NA, RSES, and the Perfectionistic Self-Promotion subscale of the PSPS each significantly mediated the effect of AN-A on DEABs. The obtained CIs (bootstrapping) for these same three variables do not include zero and therefore suggest mediation.

The SPSS macro contrasted the magnitude of each of the potential mediating variables with each of the other potential mediators. As two of the potential mediators (Nondisplay of Imperfection and Nondisclosure of Imperfection) did not uniquely mediate the effect of AN-A on DEABs, the contrasts including these variables are not included in the *Contrasts* section of Table 3.

Normal theory tests found no difference in the magnitude of the indirect effects between combinations. In contrasting the indirect effects, a CI that does not include zero

suggests that one indirect effect is larger than another. The CIs for each of the contrasts of PANAS-NA, RSES and Perfectionistic Self-Promotion with each other contained zero which indicates that there is no difference in the magnitude of the indirect effects.

Figure 3 illustrates the first multiple mediator model (AN-A). The total effect of AN-A on overall disordered eating was $B = 1.25$, $p < .001$. When the five mediators were added to the model however, the coefficient fell to $B = .25$, $p < .185$ indicating that the effect exerted on overall disordered eating by AN-A is through the mediating variables. Each of the hypothesized mediators were significantly predicted by AN-A. Furthermore, PANAS-NA, RSES, and Perfectionistic Self-Promotion significantly predicted DEABs whereas the other two hypothesized mediators did not; Nondisclosure of Imperfection and Nondisplay of Imperfection.

As AN-A was significantly correlated with age ($r = -.22$, $p < .001$), the model was re-run with age as a covariate. This re-analysis produced no appreciable differences from the original analysis reported above.

Summary. The relationship between AN-A and DEABs (EDE-Q Global) was mediated by Negative Affect (PANAS-NA), low self-esteem (RSES), and Perfectionistic Self-Promotion. There was no difference in the magnitude of these indirect effects.

Model 2: Avoidant Attachment. The second multiple mediator model tested the significance of the indirect effect of AV-A on DEABs (EDE-Q Global) through Negative Affect (PANAS-NA), self-esteem (RSES), and the three subscales of the PSPS: Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection. Normal theory test estimates and bootstrapping CIs are included in Table

4. As with the previous model, the Sobel test revealed that PANAS-NA, RSES, and Perfectionistic Self-Promotion significantly contributed to the mediation of the relationship between AV-A and DEABs. Bootstrapping CIs for these same three variables do not include zero and again suggest mediation. Normal theory tests found no difference in the magnitude of the indirect effect between the three variables. Furthermore, CIs for each of the contrasts contained zero indicating that there was no difference in the magnitude of the indirect effects.

Figure 4 illustrates the second multiple mediator model (AV-A). The total effect of AV-A on DEABs was B =.89, p < .001. When the five mediators were added to the model however, the coefficient fell to B = -.16, p < .353 indicating that the effect exerted on overall disordered eating by AV-A is through the mediating variables. Each of the hypothesized mediators were significantly predicted by AV-A. Furthermore, PANAS-NA, RSES, and Perfectionistic Self-Promotion significantly predicted DEABs whereas the other two hypothesized mediators did not; Nondisclosure of Imperfection and Nondisplay of Imperfection.

Summary. The relationship between AV-A and DEABs was mediated by Negative Affect (PANAS-NA), low self-esteem (RSES), and Perfectionistic Self-Promotion. There was no difference in the magnitude of these indirect effects.

Model 3: Overall Insecure Attachment. The independent variable in the first two models reflect related dimensions of insecure attachment. Both the multiple mediation models for AN-A and AV-A were significant and the individual contributions of the hypothesized mediators were the same in Model 1 and Model 2. The correlation between

AN-A and AV-A was .55 (see Table 2). Given these results, the total insecure attachment score (IN-A) was used in a final multiple mediator model to test the effect of IN-A on DEABs through PANAS-NA, RSES, and the subscales of the PSPS.

Normal theory test estimates and bootstrapping CIs are shown in Table 5. Again, the Sobel test revealed that PANAS-NA, RSES, and Perfectionistic Self-Promotion significantly contributed to the mediation of the relationship between IN-A and DEABs. Bootstrapping CIs for these same three variables did not include zero and again suggest mediation. Normal theory tests found no difference in the magnitude of the indirect effect between the three variables. Furthermore, CIs for each of the contrasts contained zero indicating that there is no difference in the magnitude of the indirect effects.

Figure 5 illustrates the final multiple mediator model. The total effect of IN-A on DEABs was $B = .69$, $p < .001$. As with the previous two models, when the five mediators were added, the coefficient fell to $B = .02$, $p < .835$ indicating that the effect exerted on DEABs by IN-A is through the mediating variables. Each of the hypothesized mediators were significantly predicted by IN-A. Again, each of the hypothesized mediators significantly predicted DEABs with the exception of Nondisclosure of Imperfection and Nondisplay of Imperfection.

Individual items on the PSPS were more closely examined to investigate why, of the three Perfectionistic Self-Presentation subscales, only Perfectionistic Self-Promotion emerged as a uniquely significant mediator. It was noted that two of the items on the Perfectionistic Self-Promotion scale (“It doesn’t matter if there is a flaw in my looks.”; “I don’t really care about being perfectly groomed.”) reflect perfectionism in appearance

and may tap into the construct of body image as measured through the EDE-Q dependent variable. To test this, the Perfectionistic Self-Promotion scale was rescored with the above two items eliminated. The revised subscale was then entered into each of the multiple mediation models in place of the 10-item subscale. This re-analysis produced no appreciable differences from the original analyses.

Summary. The relationship between IN-A and DEABs is mediated by low self-esteem (RSES), Negative Affect (PANAS-NA), and Perfectionistic Self-Promotion.

Parental attachment and secondary attachment style. Hypothesis 3 stated that greater avoidant and anxious attachment would be associated with less communication and trust and greater feelings of alienation with both mothers and fathers. To test Hypothesis 3, Pearson product-moment correlations were computed between maternal and paternal attachment variables (Communication, Trust, and Alienation) and ASQ attachment variables (Avoidant Attachment, Anxious Attachment, and Overall Insecure Attachment). The matrix of correlations is included in Table 6. All correlation coefficients were statistically significant in the predicted direction.

Attachment and living status. A series of one-way ANOVAs were conducted to determine if there was a difference on any of the parental attachment or attachment style variables as a reflection of whether participants lived with their parents at the time when they completed the questionnaire package. The group who did not live with their parents included 109 participants with a mean age of 21.50 years. The group who lived with their parents included 167 participants with a mean age of 17.80 years. Across group comparisons, all *p* values were greater than .08, suggesting that there were no significant

differences between those who lived with their parents and those who did not live with their parents with respect to parental attachment or attachment style.

Hierarchical multiple regression analyses. Finally, Hypothesis 4 stated that both maternal and paternal attachment variables would significantly predict anxious, avoidant, and overall insecure attachment styles. To test this hypothesis, a series of hierarchical multiple regression analyses were performed to examine the independent contribution of the IPPA variables for both mother and father on AN-A, AV-A and IN-A (see Table 7). To control for the effect of age and living status (e.g, whether or not the participant lived with parents when she completed the questionnaire) on attachment style, these variables were entered in Block 1. For living status, those who did not live with parents were coded as 0 and those living with parents were coded as 1. Two models were tested for each of the attachment style variables. In Model 1, maternal attachment variables were entered at Block 2 followed by paternal variables at Block 3 to test the contribution of paternal attachment variables to the prediction of attachment style when maternal attachment variables were controlled. In Model 2, the maternal and paternal variables were reversed.

Anxious Attachment model 1. The control variables entered at Block 1 were significant, F (2, 251) = 9.12, $p < .001$ with an R^2 value of .07 which indicated that 7% of the variance in the dependent variable, AN-A, may be explained by age and living status combined. Age was a unique significant predictor of AN-A, t = -3.95, $p < .001$ whereas living status was not. The maternal attachment variables entered in Block 2 were also significant, F (5, 248) = 15.25, $p < .001$ and together with the control variables predicted

a significant proportion of the variance in AN-A (24%), approximately 17% over and above the contribution of age and living status. Mother Alienation was the only unique significant predictor of AN-A in Block 2, $t = 5.73$, $p < .001$. Block 3, containing the paternal attachment variables was significant, F (8, 245) = 15.17, $p < .001$ with an R^2 value of .33 and R^2 change value of .10 which indicated that paternal attachment variables predicted an additional 10% variance in AN-A over and above maternal attachment. Father Alienation emerged as the only unique significant predictor in Block 3, $t = 3.40$, $p < .01$.

Anxious Attachment model 2. The results of Block 1 were the same as above. The paternal variables entered in Block 2 were also significant, F (5, 248) = 16.68, $p < .001$. The R^2 value was .25 and the R^2 change value was .18. This indicated that the addition of the paternal variables predicted 25% of the variance in AN-A, approximately 18% over and above the contribution of age and living status alone. Father Alienation was the only unique significant predictor of AN-A in Block 2, $t = 5.42$, $p < .001$. Block 3, containing the maternal attachment variables was significant, F (8, 245) = 15.17, $p < .001$ with an R^2 value of .33 and R^2 change value of .08 which indicated that maternal attachment variables predicted an additional 8% variance in AN-A over and above paternal attachment and control variables. Mother Alienation again emerged as a significant predictor in Block 3, $t = 3.98$, $p < .001$ along with Maternal Communication, $t = 2.32$, $p < .05$.

Avoidant Attachment model 1. The model 1 and model 2 analyses were re-run with AV-A as the dependant variable (see Table 7). The control variables (age and living

status) entered at Block 1 were not significant, F (2, 256) = .89, p < .410 indicating that these variables did not significantly contribute to the prediction of AV-A. The maternal attachment variables entered in Block 2 were significant, F (5, 253) = 13.91, p < .001. The R^2 value was .22 which indicated the maternal attachment variables predicted 22% of the variance in AV-A, 21% over and above the prediction by the control variables alone. As with AN-A, Mother Alienation was the only unique significant predictor of AV-A in Block 2, t = 4.67, p < .001. Block 3, containing the paternal attachment variables was significant, F (8, 250) = 10.38, p < .001 with an R^2 value of .25 and R^2 change value of .03 which indicated that paternal attachment variables contributed an additional 3% variance in AV-A over and above maternal attachment. Although Father Alienation approached significance, t = 1.74, p < .08, there were no unique significant predictors in Block 3.

Avoidant Attachment model 2. The results for the control variables (age and living status) entered at Block 1 were the same as for Model 1. The paternal attachment variables entered in Block 2 were significant, F (5, 253) = 6.96, p < .001 with the addition of the paternal attachment variables predicting 12% of the variance in AV-A. Father Alienation was the only unique significant predictor of AV-A in Block 2, t = 3.68, p < .001. Block 3, containing the maternal variables was significant, F (8, 250) = 10.37, p < .001 with an R^2 value of .25 and R^2 change value of .13 which indicated that maternal attachment variables predicted an additional 13% variance in AV-A over and above paternal attachment. Mother Alienation, t = 3.49, p < .01 emerged as the only unique significant predictor in Block 3.

Overall Insecure Attachment model 1. A final set of analyses were conducted to determine whether parental attachment variables predicted IN-A (see Table 7). Once again, the control variables were entered at Block 1, but were not significant, F (2, 251) = 2.47, $p < .09$. This indicated that overall age and living status did not significantly contribute to the prediction of IN-A. The maternal attachment variables entered in Block 2 were significant, F (5, 248) = 17.46, $p < .001$. The R^2 value was .26 which indicated that the addition of the maternal attachment variables to the control variables explained 26% of the variance in insecure attachment. Mother Alienation was the only unique significant predictor of insecure attachment in Block 2, $t = 6.08$, $p < .001$. Block 3, containing the paternal attachment variables was significant, F (8, 245) = 15.38, $p < .001$ with an R^2 value of .33 and R^2 change value of .07 which indicated that paternal attachment variables explained an additional 7% variance in insecure attachment over and above maternal attachment and control variables. Father Alienation was the only unique significant predictor among the paternal variables, $t = 2.86$, $p < .01$.

Overall Insecure Attachment model 2. The results for the control variables (age and living status) entered at Block 1 were the same as for Model 1 for Overall Insecure Attachment. The paternal attachment variables entered in Block 2 were significant, F (5, 248) = 13.03, $p < .001$. The R^2 value was .21 which indicated that the addition of the paternal attachment variables to the control variables predicted 21% of the variance in IN-A. Father Alienation was the only unique significant predictor of Overall Insecure Attachment in Block 2, $t = 5.18$, $p < .001$. Block 3, containing the maternal variables was also significant, F (8, 245) = 15.38, $p < .001$ with an R^2 value of .33 and R^2 change value

of .13 which indicated that maternal attachment variables contributed an additional 13% variance to IN-A over and above paternal attachment. Maternal Alienation, $t = 4.47$, $p < .001$ emerged as the only unique significant predictor in Block 3.

Taken together, these multiple regression results suggest that of all the parental attachment variables, feelings of alienation from both mothers and fathers influence participants' insecure attachment patterns. Furthermore, multiple mediation results indicated that anxious and avoidant attachment patterns were associated with DEABs through higher negative affect, lower self-esteem, and higher perfectionistic self-promotion. These findings remained when the overall insecure attachment score was used as the dependent variable. Figure 6 depicts the revised model of putative pathways through which attachment is associated with disordered eating according to the findings of Study 1.

Discussion

The current study confirmed a connection between secondary attachment strategy and DEABs. Higher levels of DEABs were associated with attachment insecurity, consistent with previous research (O'Kearney, 1996; Tasca & Balfour, 2014; Ward, Ramsay, & Treasure, 2000; Zachrisson & Skarderud, 2010). While the correlations between the disordered eating variables and the attachment variables were slightly stronger for the attachment anxiety dimension, both anxious and avoidant attachment dimensions were associated with DEABs. These findings suggest that disordered attitudes and behaviours around eating could represent either deactivation or hyperactivation of the attachment system for females in the current study. As

hypothesized, results also demonstrated that lower self-esteem, greater negative affect, and higher perfectionism were associated with greater attachment anxiety and avoidance, and with higher levels of disordered eating attitudes and behaviours.

The current study extended literature on the relationship between attachment and DEABs by testing the indirect effect of self-esteem, Negative Affect and Perfectionistic Self-Presentation on the relationship between secondary attachment strategy and DEABs. Overall, results were consistent with hypotheses in that the relationship between secondary attachment strategy and DEABs was mediated by self-esteem, Negative Affect and Perfectionistic Self-Presentation. This relationship was consistent for both anxious and avoidant attachment strategies. For reasons outlined above, an overall insecure dimension was explored. The significance of this third model strengthens the argument that the development of DEABs is not associated with one type of attachment strategy, but rather that insecure attachment is associated with DEABs in general.

Results from the multiple mediation models were consistent with those recently reported by Shanmugam, Jowatt, and Meyer (2012). The authors examined the indirect effects of depression, perfectionism, and self-esteem on the relationship between attachment and disordered eating. The Experiences in Close Relationships (ECR; Brennan, Clark & Shaver, 1998) measure was used to assess participants' current attachment style. Participants were asked to respond with respect to how they generally felt in their relationships with coaches, teammates and parents. The Anxious Attachment subscale measures the extent to which an individual fears rejection or abandonment by others, needs others' approval, and the distress experienced when attachment figures are

unresponsive or unavailable. The Avoidant Attachment subscale assesses the degree to which an individual fears dependence on and intimacy with others, needs to be self-reliant, and their reluctance to self-disclose. In their sample of young adult athletes, Shanmugam et al. found that the relationship between attachment and disordered eating was significantly mediated by depression, perfectionism, and self-esteem for both avoidant and anxious attachment dimensions. In their model, Shanmugan et al. used self-critical perfectionism as a potential mediator. While the indirect effect was significant, self-esteem and depression accounted for a greater proportion of the total indirect effect between attachment and DEABs.

The significance of Negative Affect in mediating the relationship between attachment and DEABs in the current study was consistent with results reported by Tasca et al. (2006) in a clinical sample. They suggested that insecure attachment may act as a vulnerability factor in the development of an eating disorder through its association with body dissatisfaction and negative affect. Tasca et al. (2009) extended this work through their examination of the mediating role of affect regulation in the relationship between attachment and DEABs and depressive symptoms in a clinical sample. With respect to eating disorder symptoms, the authors found that the relationship between attachment anxiety and DEABs was mediated by hyperactivating affect regulation strategies. While they hypothesized that the relationship between attachment avoidance and DEABs would be mediated by emotional deactivation, only the direct relationship between attachment avoidance and DEABs was significant. In a nonclinical sample, Ty and Francis (2013) examined the role of emotional dysregulation and social comparison in the relationship

between attachment and DEABs. The authors conceptualized emotional dysregulation as an impairment in understanding and adapting to negative emotions. They found that social comparison and emotional dysregulation mediated the relationship between both avoidant and anxious attachment dimensions and DEABs.

While the indirect effect for all three models in Study 1 was significant, there were differences found between the mediating variables. Self-esteem, Negative Affect, and Perfectionistic Self-Promotion each significantly mediated the relationship between attachment and DEABs. There were no differences found between the strength of the mediating effect of each of these variables. Of the three perfectionism subscales, only Perfectionistic Self-Promotion emerged as a uniquely significant mediator. It was hypothesized that this effect may have been due to items on the PSP which may have tapped into the body image construct and thus shared variance with that which it was hypothesized to predict. When the two items were removed and the model was re-run, there were no appreciable differences in the pattern or results. This suggests that the relationship between attachment and DEABs is mediated by one aspect of perfectionistic self-presentation; promoting oneself as perfect rather than the concealment of imperfections. Perfectionistic self-presentation reflects the need to appear to be perfect and is associated with personal and interpersonal distress. Promoting oneself as perfect is both "pathologically driven and interpersonally aversive" (Hewitt, 2003, p. 1305), thus may be more likely to lead to DEABs from attachment insecurity.

A unique aspect of the current study is the inclusion of maternal and paternal attachment along with secondary attachment strategies. As hypothesized, each of the

subscales for parental attachment were significantly correlated with attachment anxiety and avoidance for both mothers and fathers. Also as predicted, maternal and paternal attachment variables significantly predicted secondary attachment, thereby establishing a connection between parental attachment and the multiple mediation model for the development of DEABs. Feelings of alienation from both parents emerged as a uniquely significant predictor for Anxious, Avoidant and Overall Insecure Attachment dimensions. While having positive communication and trust in the relationships with ones' parents is important, greater feelings of alienation and isolation may have the most impact on individuals' internal working model.

Results of the current study suggest that for females, lower parental trust and communication and greater feelings of alienation predict insecure attachment patterns. Parental relationships teach us how to view ourselves and others. Feeling alienated or isolated in particular, activates the attachment behaviour system. Depending on one's internal working model based on their experiences in these parental relationships, the attachment behaviour system will either be deactivated or hyperactivated. Current results suggest that either strategy is associated with DEABs. DEABs are likely to develop from insecure attachment through poor self-esteem, negative affect, and promoting oneself as perfect.

Study 2

Results from Study 1 extended our understanding of the relationship between parental attachment and secondary attachment strategy and the mechanisms by which secondary attachment strategy is in turn related to DEABs. According to Study 1, the

relationship between secondary attachment strategy and DEABs is significantly mediated by negative affect, self-esteem, and the promotion of oneself as perfect. A question that arises from Study 1 is what mechanisms may influence the indirect effect of negative affect, self-esteem, and perfectionistic self-promotion. According to Hayes (2013), human behaviour is complex and too complicated to be reduced to a mathematical model. A more complete analysis should attempt to model the processes by which attachment is associated with DEABs, while simultaneously allowing those mechanisms "to be contingent on context, circumstance, or individual differences" (Hayes, 2013, p. 327).

Milan and Acker (2014) examined the impact of early attachment relationships on girls' responsivity to risk factors for DEABs in a sample of 447 girls with longitudinal data collected over a 12-year period. Researchers speculated that early insecure attachment relationships act as a diathesis factor that increases the chances of psychopathology in face of other stressors. They hypothesized that girls classified as insecure at 36 months of age would be more likely to report higher levels of DEABS when faced with risk factors for eating disorders. Results suggested that while the quality of early attachment relationships was not directly associated with DEABs in adolescence, it did moderate the effect of risk factors and DEABs. Specifically, for girls with an insecure early attachment history, higher Body Mass Index (BMI) at age 15 predicted a higher level of DEABs. This effect was not found for girls with a secure attachment history. Milan and Acker also measured girls' perceived attachment relationship style in adolescence. Results showed that for girls with an insecure attachment history, preoccupation with parental relationships predicted DEABs, whereas dismissiveness did

not.

While the model tested longitudinally by Milan and Acker (2014) differs somewhat with the cross-sectional model tested in Study 1, the inclusion of BMI in the current multiple mediation model as a potential moderator may further the understanding of the processes by which attachment is associated with DEABs. A further question arising from Study 1 is whether the multiple mediation model would be the same in a younger sample.

The purpose of Study 2 was to extend the current understanding of the pathways by which attachment is associated with DEABs in a sample of adolescent females living with parents. The multiple mediation model was extended to include both parental attachment and secondary attachment strategy and a potential moderator, body mass index (BMI). It was predicted that those with higher BMI would be more likely to use disordered eating attitudes and behaviours to regulate affect. The following hypotheses were postulated for Study 2.

Hypothesis 1. Overall Insecure Attachment will be positively correlated with DEABs (i.e., eating restraint, concern over eating, weight, and shape). Lower self-esteem, greater Negative Affect and higher Perfectionistic Self-Promotion will be significantly associated with greater insecure attachment and higher levels of DEABs. Lower parental and peer trust and communication and higher levels of alienation will be associated with greater DEABs, Negative Affect and Perfectionistic Self-Promotion and lower self-esteem.

Hypothesis 2. To extend the multiple mediation model to include parental

attachment, Overall Insecure Attachment will be included as a potential mediator. Lower self-esteem, Negative Affect, Perfectionistic Self Promotion, and Overall Insecure Attachment will mediate the relationship between parental attachment and DEABs for both mothers and fathers. It is hypothesized that BMI will significantly moderate the indirect effects where significant indirect effects will be found for those with higher BMI.

Method

Measures.

Inventory of Parent and Peer Attachment (IPPA). The IPPA (Armsden & Greenberg, 1987, 2009) was used to determine the quality of the participants' attachment relationships with their mothers and fathers (see Appendix A). A full description of the IPPA and psychometric properties for the IPPA Mother and IPPA Father subscales are included in the Method section of Study 1. The total attachment scales for both mother (Mother Attachment) and father (Father Attachment) served as independent variables for Study 2.

Attachment Style Questionnaire (ASQ). The ASQ (Feeney, Noller, & Hanrahan, 1994), also described in the Method section of Study 1, was used to measure Anxious Attachment (AN-A) and Avoidant Attachment (AV-A). As Study 1 established that secondary attachment strategy is significantly predicted by parental attachment variables, IN-A was included as a mediator in Study 2.

Eating Disorder Examination Questionnaire (EDE-Q). EDE-Q (Fairburn & Cooper, 1993) (Appendix C), described in Study1, was again used to measure DEABs and served as the dependent variable .

Rosenberg Self-Esteem Scale (RSES). The RSES (Rosenberg, 1979) was used to measure global self-esteem (Appendix D), again used as a potential mediator. The RSES is described in detail in Study 1.

Positive and Negative Affect Schedule (PANAS). As in Study 1, the Negative Affect scale of the PANAS (Watson, Clarke, & Tellegen, 1988) (Appendix E) was used as a potential mediator. The PANAS is described in detail in Study 1.

Perfectionistic Self-Presentation Scale (PSPS). As only the 10-item Perfectionistic Self-Promotion scale (PSP) of the PSPS (Hewitt et al, 2002) emerged as a uniquely significant mediator of the three PSPS scales in Study 1 models, only the PSP was used as a potential mediator in the current study. The psychometric properties of the scale are included in Study 1.

Procedure.

Participant recruitment. Participants were recruited from female-only Health and Physical Education classes in high schools located in Thunder Bay, Ontario. Principals from the six local high schools were contacted though letter (Appendix M) to invite their participation in the current study. Five high schools agreed to participate. These schools each completed the consent form (Appendix N), allowing the researcher to contact interested teachers teaching female classes in each school. Teachers received an information letter (Appendix O) and completed the consent form (Appendix P) to allow their students to participate in the current study. Classes of interested teachers were visited at a mutually convenient time. The researcher presented an overview of the study to students (Appendix Q) and participant and parental information letters and consent

forms (Appendix R- Appendix U) were distributed to each student. Participant and parental consent forms were collected by respective teachers to be given to the researcher prior to data collection. In addition to providing their own consent, participants under the age of 18 years also required signed consent from their parent or guardian to participate. An information letter (Appendix V) was delivered to staff in the Student Services department of each high school to inform them about the study and the possibility that participants may wish to speak with one of their counselors if they experienced negative feelings following the completion of the questionnaire packages.

Data collection. Data collection was completed from April through June 2014. The researcher returned to each class approximately one week after the initial visit. Students with signed parental and participant consent forms were given the questionnaire package to complete during class time. The questionnaires used for the current study were arranged in the booklet in the following order: EDE-Q, PANAS, RSES, IPPA-M, IPPA-F, ASQ, and PSP. Participants were asked to refrain from discussing their answers with their peers and they were encouraged to answer all questions as honestly as they could. Students were reminded that their participation in the study was voluntary and that they could withdraw at any point without penalty. Their anonymity was assured. Completed questionnaire packages were returned to the researcher upon completion. Consent forms were stored separately from completed questionnaire packages at Lakehead University.

Results

Data management. Data was examined for outliers, defined as cases with a *z*

score of +/- 3.29. Two participants were identified as outliers for age of 18 years were removed from analyses. For identified outliers on all other variables, the original raw score was replaced by the highest or lowest non-outlier value plus one following the convention of Tabachnick and Fidell (2001). In the entire data set, a total of 4 values were adjusted using this method. To be included in the analyses, a minimum of 80% of items per psychometric variable were required. When this criterion was met, a mean subscale score was calculated for each individual and used to replace the missing item. The number of items replaced on each subscale is included in Table 8. The number of replaced items ranged from 0 to 16 items across the different instruments and their subscales.

Analytic strategy. The results of Study 2 are presented as follows. Primarily, variables were explored for internal consistency using Cronbach's alpha. Next, Pearson product-moment correlation coefficients were calculated between all variables to produce an intercorrelational matrix. Third, using the PROCESS SPSS macro, moderated mediation models were tested determine whether the relationship between parental attachment and DEABs was mediated by Negative Affect, Self-Esteem, Perfectionistic Self-Promotion (PSP), and Overall Insecure Attachment (IN-A) and whether the indirect effects tested were moderated by Body Mass Index (BMI). Separate models were analyzed for maternal and paternal attachment.

Participants. Participants in Study 2 included 167 females aged 14 to 17 years (M = 14.78 years, SD = 0.86) recruited from five local area high schools in 2014. Canadian-born participants made up 94.6% of the sample. With respect to living status,

94.6% of participants reported that they lived with at least one parent or grandparent. Three participants declined to report their living status.

Psychometric properties of the variables. Indices of internal consistency (Cronbach's alpha) and descriptive statistics were computed for all subscales (see Table 8). The number of participants with complete data ranged from 155 to 167. It appears as though all subscales possess satisfactory levels of internal consistency which range from .77 to .96, similar to those found in Study 1 (Table 1).

Preliminary analyses. Prior to conducting analyses, BMI was computed for each participant using self-reported weight and height from items 37 and 39 on the EDE-Q. Next, linear associations among the Study 2 variables were computed using Pearson product-moment correlation coefficients (Table 9). Consistent with Study 1, Overall Insecure Attachment and both types of secondary attachment strategy were significantly correlated with all the subscales of the EDE-Q. Again, the correlations between AN-A and disordered eating subscales were stronger than those between AV-A and disordered eating. The Alienation, Communication and Trust subscales for both mother and father were also significantly correlated with the subscales of the EDE-Q in the predicted direction. With respect to their association with the potential mediator, the EDE-Q, IPPA Mother, IPPA Father, and ASQ variables were significantly correlated with Negative Affect and self-esteem. Correlations between Perfectionistic Self-Promotion (PSP) and EDE-Q and ASQ variables were significant as were the correlations between PSP and the Alienation scales of the IPPA. The correlation coefficients with the remaining IPPA subscales were not significant. BMI was significantly correlated with all of the subscales

of the EDE-Q as expected, but correlations with the remaining variables were not significant.

To further explore the pathways by which parental attachment is associated with DEABs, parental attachment, measured by the IPPA, was included in the multiple mediation model. Armsden and Greenberg (2009) noted that the subscales of the IPPA are highly correlated. Indeed, in the current study, the correlation coefficients among the maternal IPPA subscales ranged from .80 to .84, $p < .001$ and paternal subscales ranged from .69 to .81, $p < .001$. Therefore, the current study used only the total attachment scores for parental attachment. The Mother Attachment and Father Attachment scales served as the *X* variables in their respective models.

The subscales of the IPPA for mothers and fathers significantly predicted each of the ASQ scales in Study 1. Given this relationship, insecure attachment was included as a potential mediator (*M*) in the current model. As in Study 1, Avoidant Attachment (AV-A) and Anxious Attachment (AN-A) were significantly correlated ($r = .61$, $p < .001$) in Study 2. Therefore, only Overall Insecure Attachment (IN-A) was included in Study 2. The other potential mediators included self-esteem (RSES), negative affect (PANAS-NA), and Perfectionistic Self-Promotion (PSP). The *Y* dependent variable was DEABs, measured by the total Global core on the EDE-Q. Separate models were run for maternal and paternal attachment with BMI entered as the moderator (*V*) between the mediators (*M*) and DEABs (Figure 7).

Moderated mediation analyses. Moderated mediation, also known as conditional indirect effects, occurs when the effect of the independent variable (*X*) on the

dependent variable (*Y*) through one or more mediating variables (*M*) differs depending on the level of a moderating variable (*V*). In other words, mediation relationships are dependent on the level of the moderator (Preacher, Rucker & Hayes, 2007).

The PROCESS SPSS macro calculates an Index of Moderated Mediation (Hayes, 2014). The index quantifies the association between an indirect effect and the moderator and then infers whether the index is statistically different from zero. A novel feature of the index of moderated mediation is that it is not necessary to prove statistically significant interaction between any variable in the model and the proposed moderator in order to establish the moderation of a process. In the current study, two moderated mediation models were tested using the PROCESS (Hayes, 2014) SPSS macro. BMI was tested as a potential moderator (*V*) for both maternal and paternal attachment using Model 14.

Maternal Attachment. Bootstrapping procedures were used to test the moderated mediation model presented in Figure 7. The sample size was resampled 10,000[3] times to calculate 95 percent confidence intervals. Using the Hayes (2014) PROCESS macro, Model 14 was used to test the significance of the conditional indirect effect of Mother Attachment on DEABs (EDE-Q Global) through Negative Affect (PANAS-NA), self-esteem (RSES), Perfectionistic Self-Promotion (PSP), and Overall Insecure Attachment (IN-A). BMI was entered as the potential moderator (*V*) through which the effect of the mediators on DEABs was hypothetically contingent.

The index of moderated mediation and bootstrapping CIs for each of the

[3] Hayes (2014) recommends using $k = 10{,}000$ for moderated mediation models.

mediators are included in the top panel of Table 10. Each of the bootstrapping CIs contained zero, suggesting that the process linking maternal attachment to DEABs through the mediators is not contingent dependent on level of BMI.

The analysis was re-run using the INDIRECT SPSS macro to test the multiple mediation model without the hypothesised moderator. Normal theory test (Sobel) estimates and bootstrapping confidence intervals are included in the top panel of Table 11. The Sobel test revealed that PANAS-NA, RSES, and IN-A each significantly mediated the effect of Mother Attachment on DEABs. The obtained CIs (bootstrapping) for these same three variables do not include zero, suggesting mediation. While the Perfectionistic Self-Promotion subscale of the PSPS was a significant mediator in the models tested in Study 1, it was not uniquely significant for maternal attachment with the Study 2 sample.

Figure 8 illustrates the multiple mediator model for both maternal and paternal attachment without BMI. The total effect of Mother Attachment on DEABs was B = -0.52, $p < .001$. When the four hypothesized mediators were added to the model however, the coefficient fell to B = -.11, $p < .984$ indicating that the effect exerted on DEABs by Mother Attachment is through the mediating variables.

Paternal Attachment. The hypothesized moderated mediation model illustrated in Figure 7 was re-run using Father Attachment as the independent variable (X). The index of moderated mediation for paternal attachment is included in the bottom panel of Table 10. The bootstrapping CIs for the index of moderated mediation contained zero for each of the mediators meaning that the indirect effect of Father Attachment on DEABs through

the mediating variables was also not dependent on level of BMI.

The analysis was re-run using the INDIRECT SPSS macro to test the multiple mediation model without the hypothesised moderator. Normal theory test (Sobel) estimates and bootstrapping confidence intervals are included in the bottom panel of Table 11. The Sobel test revealed that PANAS-NA and RSES significantly mediated the effect of Father Attachment on DEABs. The obtained CIs (bootstrapping) for these variables do not include zero, suggesting mediation. As with maternal attachment, PSP was not uniquely significant for this younger sample. While Father Attachment significantly predicted Overall Insecure Attachment, Overall Insecure Attachment did not significantly predict DEABs. The indirect effect of Father Attachment to DEABs through IN-A was not significant.

The unstandardized regression coefficients for each of the paths are included in Figure 8. The total effect of Father Attachment on DEABs was $B = -0.65$, $p < .001$. When the four hypothesized mediators were added to the model however, the coefficient fell to $B = -.07$, $p < .526$ indicating that the effect exerted on DEABs by Father Attachment is through the mediating variables.

Summary. The relationship between maternal attachment and DEABs was significantly mediated by Negative Affect, self-esteem, and Overall Insecure Attachment, but not Perfectionistic Self-Promotion. The strength of this relationship was not dependent on BMI, thus the multiple mediation model was not moderated. For fathers, the relationship between attachment and DEABs was significantly mediated by Negative Affect and self-esteem, but not by Overall Insecure Attachment or Perfectionistic Self-

Promotion. Again, the indirect effects were not dependent on BMI, meaning that the overall multiple mediation model was not moderated.

Discussion

There were three main objectives for the current study. First, it sought to extend the current understanding of the relationship between parental attachment and DEABs in a younger sample of adolescent females, living with parents. The second objective was to extend the multiple mediation model to include both parental attachment and secondary attachment strategy. Finally, it sought to expand the multiple mediation model through the inclusion of body mass index (BMI) as a potential moderator.

Results from Study 1 demonstrated that the relationship between insecure attachment and DEABs is mediated by Negative Affect, self-esteem, and Perfectionistic Self-Presentation. Negative Affect, self-esteem and Perfectionistic Self-Promotion were uniquely significant mediators, whereas Nondisplay of Imperfection and Nondisclosure of Imperfection were not. These latter variables were thus not included in Study 2. While Negative Affect and self-esteem consistently mediated the relationship between attachment and DEABs, results in the current study showed that Perfectionistic Self-Promotion was not a significant mediator in the younger sample for either the maternal or paternal models. The measure used in the current study was modified to include only the Perfectionistic Self-Promotion subscale. It is possible that this modification accentuated response bias. As only one construct was being measured, it may have been easier for participants to respond in a particular way. Alternatively, the lack of unique significance for the Perfectionistic Self-Promotion scale may be due selection bias. Approximately

50% of students obtained parental consent and chose to participate in Study 2 compared to nearly all of students in the three high school classes included in Study 1. The decision to participate or not to participate may have been associated with perfectionism. A final possibility is that the promotion of oneself as perfect is linked with age. Higher self-oriented perfectionism (high personal standards) has been associated with greater DEABs in adolescents in community samples (McVey, Peper, Davis, Flett, & Abdolell, 2002). Similarly, compared to a control group, adolescents diagnosed with an eating disorder had significantly higher self-oriented perfectionism (Kirsh, McVey, Tweed & Katzman, 2007). Thus, perhaps for adolescents, having high personal standards is more important in the development of DEABs than presenting oneself as perfect.

The development of internal working models begins in childhood through a child's parental relationships. Study 1 demonstrated that parental attachment variables significantly predicted secondary attachment strategies; that is, avoidant and anxious attachment variables. The current model extended the multiple mediation model in Study 1 by using parental attachment to predict DEABs and including secondary attachment strategy as a potential mediator. While Overall Insecure Attachment was a significant mediator in the relationship between maternal attachment and DEABs, this was not the case for fathers. For adolescent females, the level of communication, trust, and feelings of alienation felt towards their fathers leads to DEABs through self-esteem and Negative Affect, but not through the use of secondary attachment strategies. Lower Father Attachment led to greater secondary attachment strategies, but did not in turn lead to greater DEABs. It is possible that to regulate their emotions associated with paternal

relationships, adolescent females do not use disordered eating, but rather another type disordered behaviour.

To extend the current understanding of the process by which attachment is associated with DEABs, BMI was tested as a potential moderator for maternal and paternal attachment. BMI did not emerge as a significant moderator in either the model for maternal or paternal attachment, thus suggesting that the relationship between parental attachment and DEABs through Negative Affect and self-esteem is similar, regardless of BMI.

The difference in results from Study 2 and those reported by Milan and Acker (2014) may be partially due to differences in the measurement of attachment. Milan and Acker used a modified Strange Situation (Cassidy, Marvin, & The MacArthur Working Group on Attachment, 1992) procedure to assess attachment at 36 months of age. For participants who were classified as insecure at age 3 years, BMI predicted greater DEABs at age 15 years. As Study 2 was cross-sectional in nature, early attachment was not assessed. Further, the parental attachment variables used in Study 2 are dimensional, whereas the Strange Situation classifies children into attachment categories. Thus, participants in Study 2 may have been less insecure overall than those classified as insecure in Milan and Acker's study.

Milan and Acker further noted that for those with an insecure attachment history, DEABs were positively associated with BMI and negatively associated with pubertal weight gain. This suggests that adolescents who had a higher BMI at age 15 and who had a higher BMI prior to puberty, reported greater DEABs. As Study 2 did not assess pre-

pubertal BMI, this additional piece may have also accounted for the difference in results.

Study 3

Results from Study 2 further extended the understanding of the pathways by which attachment is associated with the development of DEABs. While the promotion of oneself as perfect was a uniquely significant mediator in a predominately university-aged sample (Study 1), it was not for the high school participants used in Study 2. Further, insecure attachment significantly moderated the relationship between maternal attachment and DEABs in Study 2, but this effect was not found for fathers. A question arising from both previous studies is whether parental attachment leads to insecure attachment, to other mediators, and then on to DEABs. Figure 6 outlines the pathways by which parental attachment and insecure attachment are associated with DEABs. However, the statistical tools available when Study 1 analyses were conducted in 2009 limited the testing of this as a complete model. Study 2 has suggested that this model may differ for mothers and fathers, but also for females is high school versus university.

The purpose of Study 3 was to test the model outlined in Figure 6 and to determine whether the model differed depending on school and parental relationship. Study 1 included high school students, but they represented only 22% of the total sample. The combination Study 1 and Study 2 data sets allowed analyses on both high school and university participants with both close to equally represented. The following hypotheses were postulated for Study 3.

Hypothesis 1. It is hypothesized that the relationship between maternal attachment and DEABs will be serially mediated by Overall Insecure Attachment and

Negative Affect and Overall Insecure Attachment and Self-Esteem for both high school and university participants. Further, the relationship between maternal attachment and DEABs will be serially mediated by Overall Insecure Attachment and Perfectionistic Self-Promotion for university participants, but not for high school females.

Hypothesis 2. For paternal attachment, it is hypothesized that the serial indirect effects including Overall Insecure Attachment will not be significant. Specifically, the relationship between paternal attachment and DEABs will be significantly mediated by Negative Affect and self-esteem, but not when preceded by Overall Insecure Attachment. It is further hypothesized that the relationship between paternal attachment and DEABs will be mediated by Perfectionistic Self-Promotion for university participants, but not for high school females. Again, it is predicted that when Overall Insecure Attachment precedes PSP in the serial mediation, the indirect effect will not be significant.

Method

Measures. The measures used in Study 3 include the Inventory of Parent and Peer Attachment (IPPA, Armsden & Greenberg, 2009), Attachment Style Questionnaire (ASQ, Feeney, Noller, & Hanrahan, 1994), Eating Disorder Examination Questionnaire (EDE-Q, Fairburn & Cooper, 1993), Rosenberg Self-Esteem Scale (RSES, Rosenberg, 1979), Positive and Negative Affect Schedule (PANAS, Watson, Clarke & Tellegen, 1988), and Perfectionistic Self-Presentation Scale (PSPS, Hewitt et al, 2002). These measures are included in Appendices A through F and are described in detail in the Method section of Study 1.

Procedure. No new data was collected for Study 3. The data collected for Study

1 and Study 2 were combined. Procedures for participant recruitment and data collection are included in Study 1 and Study 2 respectively.

Results

Analytic strategy. There were eight years between the collection of data for Study 1 and Study 2 and the samples differed with respect to how participants were recruited. Given these basic differences, a series of one-way analysis of variance (ANOVA) analyses were run to determine if high school students from Study 1 differed from those in Study 2 on the independent, mediator, or the dependent variables. Next, Pearson product-moment correlation coefficients were calculated between all variables to produce an intercorrelational matrix. Finally, the Hayes (2014) SPSS PROCESS macro was used to test the serial mediation models for maternal and paternal attachment. Model 6 was used to determine whether the relationship between parental attachment and DEABs is mediated first by Overall Insecure Attachment (IN-A), and then by each of the mediators in separate analyses. With respect to mediators, the first model included IN-A then Negative Affect (PANAS-NA). The next model included IN-A followed by self-esteem (RSES), while the final model tested IN-A then Perfectionistic Self-Promotion (PSP). Each model was run separately for mothers and fathers. The postulated hypotheses suggest that the relationship between Mother/Father Attachment and DEABs through IN-A and PSP will differ by group. As there is no PROCESS moderated serial mediation model available to test this, the final model was run separately for high school and university participants.

Participants. There were participants aged 14 - 40 years (M = 17.60 years, SD =

4.24) in the combined data set. Of these participants, 228 (50.8%) were high school students and 203 (45.2%) were university students.

Preliminary analyses. BMI was computed for each Study 1 participant using self-reported weight and height from items 37 and 39 on the EDE-Q. A series of one-way ANOVAs were conducted to determine whether the high school students from Study 1 differed from those in Study 2 on each of the variables. The results are outlined in Table 12 and demonstrate significant differences between the high school samples for Global EDE-Q, RSES, PSP, and IN-A. The high school students from Study 1 reported lower DEABs, higher self-esteem, less Perfectionistic Self-Promotion, and lower insecure attachment. Mindful of the differences between the two samples of high school participants, the data from Study 1 and Study 2 was aggregated for the remaining analyses.

Pearson product-moment correlation coefficients were computed among Study 3 variables (Table 13). With respect to the group variable, high school students were coded as 0 and university students were coded as 1. With the exception of the group variable, all correlations were significant and in the predicted directions. The group variable was significantly correlated with Eating Restraint ($r = .12$, $p < .05$), Anxious Attachment ($r = -.11$, $p < .05$), Perfectionistic Self-Promotion ($r = -.14$, $p < .05$), Mother Attachment ($r = .10$, $p < .05$), Mother Alienation ($r = -.16$, $p < .05$).

Serial multiple mediation analyses. Model 6 was used to determine whether the relationship between parental attachment and DEABs is mediated first by Overall Insecure Attachment (IN-A), and then by each of the mediators in separate analyses. IN-

A was entered as M_1 and then Negative Affect (PANAS-NA), self-esteem (RSES) or Perfectionistic Self-Promotion (PSP) was entered as M_2. When two mediators are entered in serial, three specific indirect effects and one direct effect are estimated. Analyses were run separately for mothers and fathers. Maternal and paternal models including PSP were also run separately by group.

Maternal Attachment. Bootstrapping procedures were used to test the serial multiple mediation model presented in Figure 9. The sample size was resampled 10,000 times to calculate 95 percent confidence intervals. Using Hayes (2014) PROCESS macro, Model 6 was used to test the significance of the indirect effect of maternal attachment on DEABs (EDE-Q Global) through Overall Insecure Attachment (IN-A) and Negative Affect (PANAS-NA). IN-A was entered as M_1 and PANAS-NA was entered as M_2. Analyses revealed that the association between maternal attachment and DEABs was significantly mediated by IN-A and PANAS-NA. The indirect effects and bootstrapping CIs are presented in the top panel of Table 14. There were three potential indirect pathways by which maternal attachment and DEABs could be related; via IN-A, via IN-A and PANAS-NA, or via PANAS-NA. Only the first two indirect effects were significant, meaning that PANAS-NA mediates the relationship between maternal attachment and DEABs, but only through IN-A. The PANAS-NA model for maternal attachment was run separately for high school and university. Results were consistent with those found for the combined sample.

Model 6 was next used to test the serial multiple mediation model of maternal attachment to DEABs through IN-A and self-esteem (RSES) presented in Figure 10. IN-

A was entered as M_1 and RSES was entered as M_2. Analyses revealed that the association between maternal attachment and DEABs was significantly mediated by IN-A and RSES. The indirect effects and bootstrapping CIs are presented in the top panel of Table 14. As with Negative Affect, there were three potential indirect pathways by which maternal attachment and DEABs could be related; via IN-A, via IN-A and RSES, or via RSES alone. Again, only the first two indirect effects were significant, indicating that RSES only mediates the relationship between maternal attachment and DEABs when preceded by Overall Insecure Attachment. When the models were run separately by group, results were again consistent with those found for the combined sample.

Hayes (2014) PROCESS macro, Model 6 was used to test the significance of the indirect effect of maternal attachment on DEABs (EDE-Q Global) through Overall Insecure Attachment (IN-A) and Perfectionistic Self-Promotion (PSP). IN-A was entered as M_1 and PSP was entered as M_2. The analyses were conducted separately for university and high school students. Figure 11 outlines the model for university participants. While the total effect of X on Y (c path) was not significant, this does not necessarily negate mediation (Hayes, 2009; Preacher & Hayes, 2008). As noted above, the Baron and Kenny (1986) causal steps approach requires evidence that X and Y are associated whereas bootstrapping does not. Interpretation of mediation analyses emphasize the direction and size of the indirect effects (Hayes, 2009). Therefore, an examination of the indirect effects found in the top panel of Table 15 reveal that the relationship between maternal attachment and DEABs is mediated by IN-A alone and through IN-A and PSP. The indirect effect of PSP alone was not significant indicating

that PSP significantly mediates the relationship between maternal attachment and DEABs, but only when preceded by IN-A.

The model was re-run with only high school students. It was hypothesized that PSP would not significantly mediate the relationship between maternal attachment and DEABs. The indirect effects and bootstrapping CIs shown in the top panel of Table 15 support the hypothesis. While the indirect effect of IN-A alone mediated the relationship between maternal attachment and DEABs, the other two indirect effects including PSP were not significant. This means that for high school students, the relationship between maternal attachment and DEABs is not through Perfectionistic Self-Promotion.

Paternal Attachment. Each of the above models were re-run with Father Attachment as the predictor variable. As Overall Insecure Attachment (IN-A) was not a unique significant predictor for the paternal attachment model in Study 2, it was hypothesized that the relationship between paternal attachment and DEABs would be significantly mediated by PANAS-NA and RSES, but not when in conjunction with IN-A. It was further hypothesized that PSP would significantly mediate the relationship between paternal attachment and DEABs for university students, but not for high school students.

Bootstrapping procedures were used to test the serial multiple mediation model presented in Figure 9. The sample size was resampled 10,000 times to calculate 95 percent confidence intervals. Using Hayes (2014) PROCESS macro, Model 6 was used to test the significance of the indirect effect of paternal attachment on DEABs (EDE-Q Global) through Overall Insecure Attachment (IN-A) and Negative Affect (PANAS-NA).

IN-A was entered as M_1 and PANAS-NA was entered as M_2. Contrary to expectations, analyses revealed that the association between paternal attachment and DEABs was significantly mediated by both IN-A and PANAS-NA. The indirect effects and bootstrapping CIs are presented in the bottom panel of Table 14. There were three potential indirect pathways by which paternal attachment and DEABs could be associated; via IN-A, via IN-A and PANAS-NA, or via PANAS-NA. As with maternal attachment, only the first two indirect effects were significant. This means that PANAS-NA mediates the relationship between paternal attachment and DEABs, but only through IN-A. The PANAS-NA model for paternal attachment was run separately for high school and university. Results were consistent with those found for the combined sample.

The serial multiple mediation model of paternal attachment to DEABs through IN-A and self-esteem (RSES) is presented in Figure 10. IN-A was entered as M_1 and RSES was entered as M_2. Analyses revealed that the association between paternal attachment and DEABs was significantly mediated by IN-A and RSES. The indirect effects and bootstrapping CIs are presented in the bottom panel of Table 14. As with Negative Affect, there were three potential indirect pathways by which paternal attachment and DEABs could be related; via IN-A, via IN-A and RSES, or via RSES alone. Only the first two indirect effects were significant, indicating that RSES only mediates the relationship between paternal attachment and DEABs when preceded by Overall Insecure Attachment. The models were run separately by group. Results were again consistent with those found for the combined sample.

Finally, the significance of the indirect effect of paternal attachment on DEABs

(EDE-Q Global) through Overall Insecure Attachment (IN-A) and Perfectionistic Self-Promotion (PSP) was conducted separately for university and high school students. IN-A was entered as M_1 and PSP was entered as M_2. Figure 11 outlines the model for university participants. The indirect effects are included in the bottom top panel of Table 15. Significant indirect effects were found for the first two pathways, meaning that the relationship between paternal attachment and DEABs is mediated by IN-A alone and through IN-A and PSP. The indirect effect of PSP alone was not significant.

It was hypothesized that PSP would not significantly mediate the relationship between paternal attachment and DEABs for high school students. The indirect effects and bootstrapping CIs shown in the bottom panel of Table 15 do not support the hypothesis. As with university students, the first two indirect pathways were significant. Both IN-A alone and IN-A followed by PSP mediated the relationship between paternal attachment and DEABs. The pathway including only PSP was not significant indicating that for high school students, the relationship between paternal attachment and DEABs is mediated through Perfectionistic Self-Promotion, only when preceded by Overall Insecure Attachment.

Discussion

Over three studies, the current research has examined the relationship between attachment and disordered eating attitudes and behaviours (DEABs). The goal of Study 1 was to expand the current literature on attachment and disordered eating and to investigate the processes by which parental attachment and the secondary attachment strategies proposed by Kobak et al. are associated with DEABs in a nonclinical sample.

Results from the Study 1 multiple mediation analyses found that the relationships between both anxious (hyperactivated) and avoidant (deactivated) attachment strategies and DEABs were significantly mediated by Negative Affect, self-esteem and Perfectionistic Self-Promotion. As Avoidant and Anxious Attachment were highly correlated, a composite variable, Overall Insecure Attachment was created. The relationship between Overall Insecure Attachment and DEABs was similarly mediated. Multiple regression analyses demonstrated that parental attachment, specifically feelings of alienation from both mothers and fathers, significantly predicted both secondary attachment strategies and Overall Insecure Attachment.

Overall, the results from Study 1 suggested that the relationship between attachment and DEABs is indirect and that the development of DEABs may not be associated with one type of secondary attachment strategy, but rather insecure attachment in general. Further, parental attachment relationships predicted insecure attachment suggesting that early experiences and resulting internal working models may influence DEABs.

The purpose of Study 2 was to extend the current understanding of the relationship between parental attachment and DEABs in a younger sample of adolescent females, living with parents. The multiple mediation model was extended to include both parental attachment and insecure attachment strategies as well as a potential moderator, body mass index (BMI). Analyses conducted separately for mothers and fathers revealed that the relationship between parental attachment and DEABs was significantly mediated by Negative Affect (PANAS-NA) and self-esteem and that the indirect effect was not

dependent on level of Body Mass Index (BMI). For mothers, Overall Insecure Attachment additionally mediated the relationship between attachment and DEABs. However, the indirect effect of Overall Insecure Attachment was not significant for paternal attachment. While Study 1 found that Perfectionistic Self-Promotion was a uniquely significant mediator. These results were not replicated for parental attachment in the sample of 14 to 17 year old adolescent females.

Finally, Study 3 helped further our understanding of the mechanisms involved in the development of DEABs based on previous research as well as the results from Studies 1 and 2. The purpose of Study 3 was to replicate the model presented at the end of Study 1 and to determine whether this model differed for high school versus university students and for mothers versus fathers. The combination of both data sets allowed for analysis of close to equally distributed groups.

Results from the preliminary analyses for Study 3 showed a significant difference between high school students in Study 1 and those in Study 2 on several of the variables. Specifically, the high school students in the Study 1 sample reported overall fewer DEABs, higher self-esteem, less tendency to promote themselves as perfect, and lower insecure attachment than adolescent females in the Study 2 sample. The difference between the two high school samples may reflect a potential selection bias, a limitation discussed more fully below. The differences, however, appear to have little bearing on the overall results for Study 3.

It was hypothesized that the relationship between maternal attachment and DEABs would be serially mediated by Overall Insecure Attachment and Negative Affect

and Overall Insecure Attachment and Self-Esteem for both high school and university participants. With respect to Perfectionistic Self-Promotion, it was predicted that the relationship between maternal attachment and DEABs would be serially mediated by Overall Insecure Attachment and Perfectionistic Self-Promotion for university participants, but not for high school females. Results supported these hypotheses.

In the current research, greater maternal attachment referred to greater communication and trust and fewer feelings of alienation towards one's mother. For university students, greater maternal attachment predicted lower insecure attachment, that is, fewer deactivating and/or hyperactivating attachment behaviours. Lower levels of these secondary attachment strategies, in turn, predicted less Negative Affect, greater self-esteem, and lower levels of promoting oneself as perfect, leading to lower DEABs. For high school students, the mechanisms involved in the development of DEABs from maternal attachment were similar, but did not include the promotion of oneself as perfect.

Based on results for paternal attachment relationships from Study 2, it was hypothesized that the relationship between paternal attachment and DEABs would be significantly mediated by Negative Affect and self-esteem, but not when preceded by Overall Insecure Attachment. This hypothesis was not supported. Instead, the results closely resembled those found for maternal attachment for both high school and university participants.

While it was hypothesized that the relationship between paternal attachment and DEABs would be mediated by Perfectionistic Self-Promotion for university participants, but not for high school females, this was only partially supported. Again, Overall

Insecure Attachment emerged as a significant mediator and Perfectionistic Self-Promotion and indirect effect of Overall Insecure Attachment followed by Perfectionistic Self-Promotion was significant for both high school and university students.

We would expect that Study 3 effects including Overall Insecure Attachment for high school would be similar to those found in Study 2 since both analyses were based on the same participants. However, the number of variables used in each analysis differed from Study 2 to Study 3. The Study 2 analysis for the paternal attachment model included all four potential mediators in parallel, whereas Study 3 analyses only included two potential mediators in each model. Because of missing data across the variables, the number of participants (n = 148) included in the Study 2 analysis was much lower than the number of participants (n = 199-204) included in the Study 3 paternal attachment analyses. It is possible that increasing the number of cases included in the analysis changed the results with respect to Overall Insecure Attachment. Thus, it is important to replicate the model with a different group of adolescent females to further explore the role of Overall Insecure Attachment in the relationship between paternal attachment and DEABs.

Each study furthered our understanding of the mechanisms involved and for whom the mechanisms may be most relevant. At the end of the three studies, it is possible to make some conclusions about the relationship between attachment and DEABs. First, both deactivating (avoidant) and hyperactivating (anxious) secondary attachment strategies are associated with DEABs. Anxious Attachment was often more strongly correlated with DEABs, but Avoidant Attachment was also significant. It would appear

that either type of attachment behaviour could lead to DEABs in nonclinical females.

Furthermore, negative affect and self-esteem consistently mediated the relationship between both secondary attachment strategy and DEABs and parental attachment and DEABs. In Study 3 for the combined sample, the negative affect model explained 38% of the variance in DEABs for both mothers and fathers. The self-esteem model explained 35% of the variance in DEABs for both parents. The models were not appreciably different for high school and university students. These results suggest that both negative affect and low self-esteem stemming, in part, from early attachment experiences, are significant in the development and maintenance of DEABs in females aged 14 through 40 years.

Study 3 identified that both Negative Affect and self-esteem mediate the relationship between parental attachment and DEABs, but only through secondary attachment strategy. This extends the research which, to this point, has not simultaneously examined the role of maternal and paternal attachment and secondary attachment strategies in multiple mediation models predicting DEABs.

Perfectionistic Self-Promotion is an important piece in understanding the relationship between attachment and DEABs. It appears as though the promotion of oneself as perfect is associated with both maternal and paternal attachment for university students, but only through Overall Insecure Attachment. Lower trust, communication, and greater feelings of alienation reported by university females towards both parents predicted more insecure attachment strategies, which in turn led to the promotion of oneself as perfect and greater DEABs. Without insecure attachment strategies, the

promotion of oneself as perfect did not lead to DEABs from either maternal or paternal attachment. For high school students, the relationship between paternal attachment and DEABs was similar. The relationship between maternal attachment and DEABs for high school students, however, was not. It is possible that high school females feel that promoting themselves as perfect will either help them attain proximity to their fathers or avoid rejection in other relationships.

High school students differ from university students in at least two known ways. Primarily, most high school students are still living at home with at least one parent. Their primary attachment figures continue to directly influence their internal working models for relationships through daily interaction. Further, while the majority of adolescents attend high school, only a portion of these students will pursue post-secondary education. The pressures associated with maintaining a high academic standard in post-secondary education may help explain why promoting oneself as perfect is more consistently associated with attachment and DEABs in this group.

Not all females who have poor parental attachment relationships will end up with disordered eating attitudes and behaviours. There are moderating factors which may help determine who would be more likely to develop DEABs. Study 2 tested the role of BMI as a potential moderator. It was hypothesized that parental attachment would be associated with DEABs through Negative Affect, self-esteem, Perfectionistic Self-Promotion, and Overall Insecure Attachment and that this relationship would be dependent on level of BMI. It was predicted that those with higher BMI would be more likely to use DEABs to regulate their emotions. This was not the case. It appears as

though the relationship between parental attachment and DEABs through Negative Affect and self-esteem is similar, regardless of BMI. Study 3 tested whether the multiple mediation model was the same for both high school and university students. While we were not able to directly test school as a moderator, the difference in the pattern of results between high school and university students with respect to maternal attachment and the promotion of oneself as perfect suggests moderation.

Strengths, limitations and future directions. The current research has a number of strengths. First, multiple mediators were examined and potential moderators were explored. Further, parental attachment was simultaneously investigated with insecure attachment dimensions and attachment relationships with mothers and fathers were explored separately. Finally, participants included both university and high school females, allowing for comparison of the two groups.

There are also limitations that need to be acknowledged. First, the measures used were all self-report and results are thus subject to social desirability. Secondly, without a prospective, longitudinal study, it is difficult to determine how attachment-related vulnerabilities may affect the development of DEABs over time.

A further limitation is the presence of a potential selection bias for high school students in Studies 1 and 2. In Study 1, participation in the Turning Points program was considered to be part of the curriculum for the three classes. While the research component of Turning Points was voluntary, nearly all of the students had parental consent and chose to participate. Study 2 contained only the research component and Turning Points was not subsequently run in the classes. Approximately 50% of students

in Study 2 had parental consent and chose to participate. The students who chose to obtain parental consent and participate in the study may differ from those who did not. Therefore, the sample obtained may not be truly representative of all high school females. Further, Study 1 contained students from only one high school, whereas five high schools were represented in Study 2. While permission was obtained from each of the teachers prior to speaking to their students, there may have also been differences in how the teachers viewed the importance of research and how it was conveyed to students. In spite of differences between high school students in the two samples, results from Study 3 were largely as predicted. Nonetheless, it is important to replicate these results with other high school females while minimizing the possibility of selection bias.

Finally, perhaps the most significant limitation of the current research is the implication of causality from multiple mediation models in cross-sectional study. Andrew Hayes calls causality the "cinnamon bun of social science. It is a sticky concept, and establishing that a sequence of events is a causal one can be a messy undertaking." (Hayes, 2013, p. 17). The goal of this research was not to definitively outline the pathways by which disordered eating attitudes and behaviours develop from early attachment experiences. Rather, the purpose was to take relevant research and develop testable models to further our understanding of the mechanisms involved in the relationship between attachment and DEABs. Previous published research had established connections among the variables studied. The current studies tested these relationships. While the data is correlational in nature, both the conditional and unconditional multiple mediation bootstrapping analyses helped test theoretically relevant

connections.

While the current research extends the understanding of the mechanisms by which attachment and DEABs are associated, further research is necessary. We may speculate that similar mechanisms would be involved in females diagnosed with eating disorders, however, the model should be replicated in a clinical sample.

Most of the models tested separately for mothers and fathers yielded similar results, but there was some inconsistency with respect to paternal attachment and insecure attachment strategies. Future studies should further investigate how attachment to both mothers and fathers are associated with development of DEABs.

Like the current research, others (Bamford & Halliwell, 2009; Shanmugan, Jowett & Meyer, 2012; Tasca et al., 2006; Ty & Francis, 2013) have begun to examine the mechanisms involved in attachment and the development of DEABS. Future studies should further investigate other potential mediators as well as moderators. For example, in a prospective study in which adolescent girls completed diagnostic interviews and surveys annually over eight years, Stice, Marti, and Durant (2011) found that body dissatisfaction was the strongest predictor of eating disorder onset. McGee et al. (2005) found that body dissatisfaction moderated the relationship between perfectionistic self-presentation and DEABs. Thus, testing whether the relationship between attachment and DEABs through Negative Affect, self-esteem, and the promotion of oneself as perfect is moderated by body dissatisfaction may yield valuable information. Learning more about the individual differences on which the pathways between attachment and DEABs could be contingent may help inform preventative programs and clinical interventions.

Clinical implications. The results of the current research have practical and clinical implications for the prevention and treatment of disordered eating attitudes and behaviours. First, the importance of attachment relationships with both mothers and fathers is highlighted in the current research. Being able to trust and communicate with parents as well as feeling accepted and not alienated by them was consistently associated with lower attachment anxiety and avoidance and with fewer disordered eating attitudes and behaviours. Feelings of alienation from both mothers and fathers had the strongest relationships with disordered eating, Negative Affect, self-esteem, and Perfectionistic Self -Promotion.

Moretti and Peled (2004) emphasized the importance of continued involvement of parents in the lives of their adolescents. During adolescence, parents may feel as though they have little influence in the lives of their children and allow them to detach or disengage from the family. It is essential for parents to help their adolescents navigate the cognitive, social, and emotional changes associated with adolescence through consistency, responsivity, and predictability. Conflict within the parent-adolescent relationship is normal. When adolescents feel understood by their parents and trust the commitment of their parents to the relationship, they will move more confidently into adulthood, even in the presence of conflict. Parents may perceive conflict with their adolescents as a personal rejection. These feelings of rejection may lead to more parental disengagement in the lives of their daughters, which may in turn contribute to a more negative sense of self and/or others and the engagement of secondary attachment strategies.

It is necessary to help parents reframe conflict as an opportunity to build relationships. Educational programming that emphasizes the continued importance of healthy attachment relationships with parents and other adults through adolescence gives parents the skills to support their children would be beneficial (Moretti & Peled, 2004). Interventions such as emotionally focused family therapy may help address problems associated with family interactions and negative relationship patterns, and encourage a positive sense of self in attachment relationships (Johnson, Maddeaux & Blouin, 1998).

While the current research was conducted with nonclinical samples, there are possible implications for the treatment of eating disorders. Illing, Tasca, Balfour and Bissada (2010) found that patients diagnosed with an eating disorder had significantly higher attachment insecurity than those in the comparison group. Overall, greater attachment anxiety was associated with increased severity of symptoms and poorer treatment outcomes across eating disorder diagnoses. The assessment of attachment processes may give clinicians valuable information with respect to how clients view themselves and others and what strategies they may use to regulate their emotions. Understanding secondary attachment strategies as a means by which negative emotions may be managed may inform interventions that teach more effective ways of coping. An increased understanding of the role of negative affect and self-esteem in the development of DEABs from attachment insecurity may further inform targeted interventions. While attachment patterns become increasingly resistant to change over time, cognitive behavioural therapy may help address cognitions around negative internal working models of self and others and modify maladaptive beliefs and expectations around

relationships with significant others (Ty & Francis, 2013). Attachment insecurity is common for those suffering from eating disorders and symptom-focused interventions are less likely to be effective for clients with eating disorders and insecure attachment (Tasca, Richie & Balfour, 2011). Inventions that target both eating disorder symptoms and attachment functioning may yield the best treatment outcomes (Tasca, Richie & Balfour).

Psychopathology arising from insecure attachment relationships is well documented (Dozier, Stovall-McClough, & Albus, 2008). In recent years, our knowledge of the pathways by which attachment is associated with disordered eating has broadened. The current research has furthered this understanding through examining the impact of parental attachment relationships on internal working models and secondary attachment strategies. It further established negative affect and self-esteem as significant mediating variables between parental attachment and DEABS through attachment insecurity. The role of the promotion of oneself as perfect appears to play a unique role that differs by parental relationship and school. The knowledge gained in the current research has practical significance in understanding insecure attachment as a vulnerability factor for DEABs. By addressing the importance of parental attachment relationships and secondary attachment strategies in the development and maintenance of disordered eating attitudes and behaviours, it may be possible to help prevent the development of eating disorders from insecure attachment relationships.

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Table 1

Means, Standard Deviations, and Cronbach's Alpha Coefficients of Study 1 Variables

Variable	α	No. of items	*M*	*(SD)*	Replaced values	*n*
EDE-Q Subscales						
Global	.96	22	44.52	(30.27)	-	281
Restraint	.86	5	7.88	(7.00)	3	281
Eating Concern	.82	5	5.67	(5.87)	5	281
Shape Concern	.93	8	20.85	(13.27)	5	279
Weight Concern	.87	5	11.12	(8.06)	2	281
Attachment Style Questionnaire						
Overall Insecure Attachment	.90	29	92.27	(20.22)	-	270
Avoidant Attachment	.85	16	49.47	(11.41)	17	275
Anxious Attachment	.87	13	42.79	(11.49)	8	270
Rosenberg Self-Esteem Scale	.89	10	29.42	(5.78)	5	279
Positive and Negative Affect Scale						
Negative Affect	.89	10	22.48	(8.17)	14	278
Perfectionistic Self-Presentation Scale						
Perfectionistic Self-Promotion	.89	10	36.70	(11.54)	22	277
Nondisplay of Imperfection	.88	10	38.75	(11.50)	26	279
Nondisclosure of Imperfection	.82	7	22.28	(7.27)	18	277
Inventory of Parent Attachment						
Trust (Mother)	.92	10	40.38	(8.08)	17	280
Communication (Mother)	.91	9	32.27	(8.51)	7	280
Alienation (Mother)	.80	6	21.67	(5.12)	7	280
Trust (Father)	.94	10	37.37	(9.93)	10	269
Communication (Father)	.92	9	26.96	(9.34)	9	268
Alienation (Father)	.82	6	20.10	(5.98)	3	269

Note. The variation in sample size is due to the number of cases with complete data. EDE-Q = Eating Disorder Examination Questionnaire.

Table 2

Correlations Among Study 1 Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Eating Restraint												
2. Eating Concern	.68											
3. Shape Concern	.70	.80										
4. Weight Concern	.67	.77	.93									
5. EDE-Q Global Score	.82	.88	.96	.94								
6. Avoidant Attachment	.27	.28	.32	.31	.33							
7. Anxious Attachment	.29	.42	.48	.45	.46	.55						
8. Overall Insecure Attachment	.32	.39	.45	.43	.45	.88	.88					
9. Self-Esteem	-.34	-.53	-.54	-.54	-.54	-.48	-.62	-.63				
10. Perfectionistic Self-Promotion	.35	.39	.44	.42	.45	.40	.46	.49	-.40			
11. Nondisplay of Imperfection	.32	.40	.45	.42	.45	.48	.66	.65	-.56	.74		
12. Nondisclosure of Imperfection	.28	.31	.35	.36	.36	.63	.51	.65	-.49	.63	.71	
13. Negative Affect	.39	.54	.55	.53	.56	.44	.47	.52	-.57	.30	.41	.32

Note. EDE-Q = Eating Disorder Examination-Questionnaire; n = 268-281.
p value for all correlation coefficients < .001.

Table 3

Mediation of the Effect of Anxious Attachment on Disordered Eating Attitudes and Behaviours (DEABs) Through Negative Affect, Self-Esteem, Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection

		Product of Coefficients		Bootstrapping (BCa 95% CI)	
	Point Estimate	*SE*	*z*	Lower	Upper
		Indirect effects			
Negative Affect	0.4048	0.0870	4.6548*	0.2258	0.6282†
Self-Esteem	0.3960	0.1161	3.4098*	0.1763	0.6368†
Perfectionistic Self-Promotion	0.3395	0.0980	3.4634*	0.1839	0.5860†
Nondisplay of Imperfection	-0.0792	0.1583	-0.5004	-0.4088	0.2231
Nondisclosure of Imperfection	-0.0579	0.0961	-0.6019	-0.2579	0.1369
		Contrasts			
Self-esteem vs. PSP	0.0565	0.1479	0.3819	-0.2803	0.3271
Self-Esteem vs. Negative Affect	-0.0089	0.1617	-0.0648	-0.3579	0.3216
Negative Affect vs. PSP	-0.0653	0.1304	-0.5009	-0.3219	0.2441

Note. PSP= Perfectionistic Self-Promotion. BCa 95% CI= Bias Corrected and Accelerated at 95% Confidence Interval. † Confidence Interval does not include zero suggesting significant mediation.

* $p<.001$.

Table 4

Mediation of the Effect of Avoidant Attachment on Disordered Eating Attitudes and Behaviours (DEABs) Through Negative Affect, Self-Esteem, Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection

		Product of Coefficients		Bootstrapping (BCa 95% CI)	
	Point Estimate	*SE*	*z*	Lower	Upper
		Indirect effects			
Negative Affect	0.4172	0.0866	4.8186*	0.2589	0.6066†
Self-Esteem	0.3668	0.0929	3.9505*	0.1947	0.5752†
Perfectionistic Self-Promotion	0.3033	0.0886	3.4249*	0.1457	0.4938†
Nondisplay of Imperfection	-0.0208	0.1064	-0.1950	-0.2527	0.1823
Nondisclosure of Imperfection	-0.0106	0.1327	-0.0798	-0.2651	0.2594
		Contrasts			
Self-esteem vs.PSP	0.0635	0.1220	0.5206	-0.1640	0.3031
Self-Esteem vs. Negative Affect	-0.0504	0.1373	-0.3669	-0.3545	0.2298
Negative Affect vs. PSP	-0.1139	0.1219	-0.9346	-0.3774	0.1297

Note. PSP= Perfectionistic Self-Promotion. BCa 95% CI= Bias Corrected and Accelerated at 95% Confidence Interval. † Confidence Interval does not include zero suggesting significant mediation.

* $p<.001$.

Table 5

Mediation of the Effect of Overall Insecure Attachment on Disordered Eating Attitudes and Behaviours (DEABs) Through Negative Affect, Self-Esteem, Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection

	Product of Coefficients			Bootstrapping (BCa 95% CI)	
	Point Estimate	*SE*	*z*	Lower	Upper
			Indirect effects		
Negative Affect	0.2585	0.0536	4.8189*	0.1496	0.3883†
Self-Esteem	0.2501	0.0665	3.7617*	0.1263	0.3975†
Perfectionistic Self-Promotion	0.2018	0.0585	3.4514*	0.0985	0.3254†
Nondisplay of Imperfection	-0.0055	0.0849	-0.0649	-0.1851	0.1564
Nondisclosure of Imperfection	-0.0439	0.0738	-0.5944	-0.1925	0.1074
			Contrasts		
Self-esteem vs. PSP	0.0482	0.0861	0.5599	-0.1187	0.2243
Self-Esteem vs. Negative Affect	-0.0084	0.0951	-0.0883	-0.2127	0.2026
Negative Affect vs. PSP	-0.0566	0.0795	-0.7120	-0.2252	0.1083

Note. PSP= Perfectionistic Self-Promotion. BCa 95% CI= Bias Corrected and Accelerated at 95% Confidence Interval. † Confidence Interval does not include zero suggesting significant mediation.
* $p<.001$.

Table 6

Correlations Among Parental Attachment and Attachment Style Variables

	Trust		Communication		Alienation	
Variable	Mother	Father	Mother	Father	Mother	Father
Avoidant Attachment	-.32**	-.25**	-.34**	-.25**	.42**	.33**
Anxious Attachment	-.24**	-.30**	-.19*	-.29**	.42**	.46**
Overall Insecure Attachment	-.32**	-.30**	-.32**	-.30**	.49**	.44**

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

Table 7

Hierarchical Multiple Regression Analyses Predicting Attachment Style Questionnaire (ASQ) Variables From IPPA Variables

	Anxious Attachment		Avoidant Attachment		Overall Insecure Attachment	
Predictors	ΔR^2	β	ΔR^2	B	ΔR^2	β
Model 1						
Step 1	.07**		.01		.02	
Age		-.26**		-.00		-.15
Living Status		.00		-.08		-.05
Step 2 IPPA Mother	.17**		.21**		.24**	
Trust		.06		.14		.12
Communication		.14		-.14		-.00
Alienation		.56**		.45**		.58**
Step 3 IPPA Father	.10**		.03*		.07**	
Trust		.15		.02		.10
Communication		-.15		-.04		-.11
Alienation		.34**		.18		.29*
Model 2						
Step 1	.07**		.01		.02	
Age		-.26**		-.00		-.15
Living Status		.00		-.08		-.05
Step 2 IPPA Father	.18**		.12**		.19**	
Trust		.12		.49		.11
Communication		-.01		-.00		-.01
Alienation		.52**		.38**		.51**
Step 3 IPPA Mother	.08**		.13**		.13**	
Trust		-.08		.08		.01
Communication		.24*		-.10		.08
Alienation		.40**		.37**		.45**

Note. IPPA = Inventory of Parent and Peer Attachment.
*p <.05. **p <.001.

Table 8

Means, Standard Deviations, and Cronbach's Alpha Coefficients of Study 2 Variables

Variable	α	No.of items	*M*	*(SD)*	Replaced values	*n*
EDE-Q Subscales						
Global	.96	22	48.14	(33.84)	8	166
Restraint	.82	5	1.45	(1.43)	1	165
Eating Concern	.77	5	1.25	(1.27)	3	166
Shape Concern	.93	8	2.78	(1.80)	3	167
Weight Concern	.90	5	2.51	(1.85)	0	167
Attachment Style Questionnaire						
Overall Insecure Attachment	.92	29	97.62	(24.24)	16	164
Avoidant Attachment	.87	16	55.58	(13.89)	12	166
Anxious Attachment	.88	13	45.04	(13.05)	11	164
Rosenberg Self-Esteem Scale	.91	10	27.56	(6.91)	6	166
Positive and Negative Affect Scale						
Negative Affect	.88	10	21.71	(8.24)	8	164
Perfectionistic Self-Presentation Scale						
Perfectionistic Self-Promotion	.84	10	41.63	(12.19)	2	166
Inventory of Parent Attachment						
Total Attachment (Mother)	.96	25	90.26	(23.33)	16	163
Alienation (Mother)	.84	6	15.53	(6.09)	5	167
Trust (Mother)	.93	10	39.62	(9.38)	13	167
Communication (Mother)	.91	9	30.50	(9.33)	7	167
Total Attachment (Father)	.95	25	83.17	(22.50)	11	155
Alienation (Father)	.79	6	16.19	(5.95)	4	158
Trust (Father)	.86	10	37.70	(9.88)	6	158
Communication (Father)	.89	9	25.46	(8.90)	5	157

Note. The variation in sample size is due to the number of cases with complete data. EDE-Q = Eating Disorder Examination Questionnaire.

Table 9

Correlations Among Study 2 Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Eating Restraint																			
2. Eating Concern	.70*																		
3. Shape Concern	.66*	.77*																	
4. Weight Concern	.67*	.78*	.91*																
5. EDE-Q Global	.81*	.87*	.96*	.95*															
6. Avoidant Attachment	.31*	.41*	.39*	.37*	.41*														
7. Anxious Attachment	.39*	.53*	.59*	.57*	.58*	.61*													
8. Insecure Attachment	.39*	.53*	.54*	.52*	.55*	.90*	.89*												
9. Self-Esteem	-.31*	-.51*	-.58*	-.54*	-.55*	-.46*	-.64*	-.61*											
10. PSPS Self-Promotion	.24*	.26*	.26*	.26*	.28*	.25*	.42*	.37*	-.28*										
11. Negative Affect	.42*	.58*	.60*	.59*	.62*	.46*	.62*	.60*	-.52*	.27*									
12. Mother Total Attachment	-.26*	-.35*	-.32*	-.34*	-.36*	-.62*	-.54*	-.64*	.44*	-.12	-.46*								
13. Mother Alienation	.28*	.38*	.38*	.40*	.41*	.62*	.60*	.68*	-.46*	.21*	.56*	-.91*							
14. Mother Trust	-.26*	-.33*	-.31*	-.32*	-.34*	-.53*	-.47*	-.56*	.43*	-.10	-.40*	.95*	-.80*						
15. Mother Communication	-.23*	-.30*	-.27*	-.28*	-.30*	-.58*	-.48*	-.60*	.38*	-.11	-.38*	.95*	-.80*	.84*					
16. Father Total Attachment	-.26*	-.37*	-.45*	-.41*	-.43*	-.51*	-.49*	-.56*	.47*	-.13	-.49*	.55*	-.53*	.52*	.48*				
17. Father Alienation	.28*	.40*	.49*	.44*	.46*	.51*	.61*	.63*	-.48*	.20†	.62*	-.53*	.59*	-.45*	-.45*	-.85*			
18. Father Trust	-.25*	-.31*	-.41*	-.36*	-.38*	-.47*	.39*	.48*	.44*	-.06	-.38*	.54*	-.46*	.55*	.47*	.95*	-.72*		
19. Father Communication	-.15	-.27*	-.36*	-.31*	-.32*	-.37*	-.38*	-.42*	.39*	-.10	-.34*	.39*	-.38*	.34*	.37*	.93*	-.85*	.81*	
20. Body Mass Index	.24*	.22*	.32*	.40*	.33*	.03	.02	.03	-.02	-.12	.11	.01	.02	-.02	.04	-.04	-.04	-.10	-.03

Note. EDE-Q = Eating Disorder Examination-Questionnaire; N = 155-167. † $p < .05$. *$p < .001$.

Table 10

Index of Moderated Mediation for Study 2 Models

			Bootstrapping (95% CI)	
	Index	SE (Boot)	Lower	Upper
	Maternal Attachment			
Negative Affect	-0.0057	0.0161	-0.0427	0.0217
Self-Esteem	-0.0045	0.0176	-0.0448	0.0257
Perfectionistic Self-Promotion	-0.0019	0.0039	-0.0146	0.0032
Overall Insecure Attachment	0.0147	0.0237	-0.0344	0.0596
	Paternal Attachment			
Negative Affect	-0.0099	0.0181	-0.0500	0.0228
Self-Esteem	-0.0081	0.0191	-0.0527	0.0245
Perfectionistic Self-Promotion	-0.0019	0.0041	-0.0149	0.0031
Overall Insecure Attachment	0.0179	0.0224	-0.0285	0.0613

N = 152 (Overall Maternal Attachment); 144 (Overall Paternal Attachment).

Table 11

Mediation of the Effect of Maternal and Paternal Attachment on Disordered Eating Attitudes and Behaviours (DEABs) Through Negative Affect, Self-Esteem, Perfectionistic Self-Promotion, and Overall Insecure Attachment

		Product of Coefficients		Bootstrapping (BCa 95% CI)	
	Point Estimate	*SE*	*z*	Lower	Upper
Maternal Attachment					
Negative Affect	-0.2526	0.0638	-3.9579**	-0.4188	-0.1301†
Self-Esteem	-0.1643	0.0565	-2.9069*	-0.3103	0.0580†
Perfectionistic Self-Promotion	-0.0063	0.0124	-0.5134	-0.0493	0.0129
Overall Insecure Attachment	-0.2088	0.0930	-2.2465*	-0.4409	-0.0047†
Paternal Attachment					
Negative Affect	-0.2767	0.0734	-3.7719**	-0.4581	-0.1506†
Self-Esteem	-0.1574	0.0633	-2.4865*	-0.3206	-0.0288†
Perfectionistic Self-Promotion	-0.0134	0.0158	-0.8492	-0.0702	0.0077
Overall Insecure Attachment	-0.1282	0.0818	-1.5665	-0.3223	0.0400

Note. BCa 95% CI= Bias Corrected and Accelerated at 95% Confidence Interval.
† Confidence Interval does not include zero suggesting significant mediation.
* $p<.05$. ** $p<.001$.

Table 12

Summary of One-way ANOVAs for Study 3 Variables as a Function of High School Sample (Study 1 vs. Study 2)

	Study 1		Study 2		
Variable	*M*	*SD*	*M*	*SD*	*F*
EDE-Q Global	34.98	25.26	48.14	33.84	7.64*
Overall Insecure Attachment	89.88	17.88	97.62	24.24	4.87*
Self-Esteem	29.72	4.63	27.56	6.91	5.05*
Negative Affect	20.26	6.71	21.71	8.24	1.46
Perfectionistic Self-Promotion	35.88	11.26	41.62	12.19	10.31*
Mother Total Attachment	94.59	18.63	90.26	23.33	1.68
Father Total Attachment	85.74	20.74	83.17	22.50	0.55

Note. EDE-Q = Eating Disorder Examination-Questionnaire; $n = 61$ (Study 1); 166 (Study 2).
*$p < .05$.

Table 13
Correlations Among Study 3 Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Eating Restraint																			
2. Eating Concern	.66*																		
3. Shape Concern	.67*	.78*																	
4. Weight Concern	.66*	.77*	.92*																
5. EDE-Q Global	.80*	.87*	.97*	.95*															
6. Avoidant Attachment	.28*	.33*	.36*	.34*	.37*														
7. Anxious Attachment	.32*	.47*	.53*	.51*	.52*	.59*													
8. Insecure Attachment	.34*	.44*	.50*	.48*	.50*	.89*	.89*												
9. Self-Esteem	-.29*	-.50*	-.55*	-.54*	-.54*	-.46*	-.63*	-.61*											
10. PSPS Self-Promotion	.29*	.32*	.37*	.35*	.38*	.32*	.44*	.43*	-.34*										
11. Negative Affect	.38*	.52*	.55*	.54*	.56*	.43*	.51*	.53*	-.52*	.26*									
12. Mother Total Attachment	-.14†	-.17*	-.18*	-.19*	-.20*	-.50*	-.39*	-.51*	.29*	-.18*	-.31*								
13. Mother Alienation	.17*	.25*	.27*	.27*	.28*	.52*	.49*	.57*	-.36*	.25*	.42*	-.89*							
14. Mother Trust	-.12†	-.16*	-.18*	-.20*	-.19*	-.42*	-.33*	-.43*	.26*	-.15*	-.28*	.94*	-.78*						
15. Mother Communication	-.12†	-.11†	-.11†	-.12†	-.13†	-.47*	-.32*	-.45*	.23*	-.13†	-.22*	.94*	-.78*	.82*					
16. Father Total Attachment	-.21*	-.23*	-.29*	-.28*	-.29*	-.36*	-.42*	-.44*	.32*	-.14†	-.29*	.37*	-.36*	.32*	.34*				
17. Father Alienation	.21*	.26*	.35*	.33*	.31*	.40*	.53*	.52*	-.38*	.21*	.41*	-.36*	.44*	-.28*	-.32*	-.87*			
18. Father Trust	-.21*	-.20*	-.27*	-.26*	-.27*	-.33*	-.35*	-.38*	.28*	-.10†	-.24*	.37*	-.33*	.37*	.33*	.95*	-.75*		
19. Father Communication	-.14†	-.18*	-.22*	-.20*	-.21*	-.29*	-.34*	-.35*	.26*	-.11†	-.18*	.28*	-.25*	.21*	.30*	.93*	-.73*	.81*	
20. Group	.12†	-.02	.02	-.02	.01	-.05	-.11†	-.09	13†	-.14†	.06	.10†	-.16*	.06	.06	.02	-.07	-.03	.04

Note. EDE-Q = Eating Disorder Examination-Questionnaire; N = 400-431. † $p < .05$. *$p < .001$.

Table 14

Serial Mediation of the Effect of Maternal and Paternal Attachment on Disordered Eating Attitudes and Behaviours (DEABs) through Overall Insecure Attachment and Negative Affect and Overall Insecure Attachment and Self-Esteem for Combined Sample

	Indirect Effect		Bootstrapping (95% CI)	
DEABs	Point Estimate	*SE*	Lower	Upper
Maternal Attachment				
Indirect via Insecure Attachment	-0.2366	0.0447	-0.3333	-0.1565†
Indirect via Insecure Attachment → Negative Affect	-0.1682	0.0299	-0.2334	-0.1164†
Indirect via Negative Affect	-0.0422	0.0339	-0.1123	0.0218
Indirect via Insecure Attachment	-0.2087	0.0496	-0.3145	-0.1194†
Indirect via Insecure Attachment → Self-Esteem	-0.1895	0.0357	-0.2676	-0.1275†
Indirect via Self Esteem	0.0078	0.0264	-0.0448	0.0595
Paternal Attachment				
Indirect via Insecure Attachment	-0.1493	0.0346	-0.2250	-0.0880†
Indirect via Insecure Attachment → Negative Affect	-0.1307	0.0247	-0.1847	-0.0878†
Indirect via Negative Affect	-0.0371	0.0288	-0.0984	0.0152
Indirect via Insecure Attachment	-0.1407	0.0389	-0.2248	-0.0711†
Indirect via Insecure Attachment → Self-Esteem	-0.1397	0.0286	-0.2050	-0.0920†
Indirect via Self Esteem	-0.0327	0.0241	-0.0855	0.0097

Note. CI= Confidence Interval. † Confidence Interval does not include zero suggesting significant mediation.

Table 15

Serial Mediation of the Effect of Maternal and Paternal Attachment on Disordered Eating Attitudes and Behaviours (DEABs) through Overall Insecure Attachment and Perfectionistic Self-Promotion (PSP) by Group

	Indirect Effect		Bootstrapping (95% CI)	
DEABs	Point Estimate	*SE*	Lower	Upper
Maternal Attachment				
University				
Indirect via Insecure Attachment	-0.1818	0.0557	-0.3157	-0.0921†
Indirect via Insecure Attachment → PSP	-0.0790	0.0268	-0.1496	-0.0384†
Indirect via PSP	-0.0481	0.0343	-0.1292	0.0108
High School				
Indirect via Insecure Attachment	-0.4470	0.0865	-0.6283	-0.2902†
Indirect via Insecure Attachment → PSP	-0.0467	0.0304	-0.1141	-0.0067
Indirect via PSP	0.0298	0.0230	-0.0018	0.0940
Paternal Attachment				
University				
Indirect via Insecure Attachment	-0.1319	0.0413	-0.2252	-0.0630†
Indirect via Insecure Attachment → PSP	-0.0661	0.0220	-0.1212	-0.0315†
Indirect via PSP	0.0152	0.0289	-0.0365	0.0790
High School				
Indirect via Insecure Attachment	-0.3127	0.0712	-0.4700	-0.1891†
Indirect via Insecure Attachment →PSP	-0.0409	0.0244	-0.0981	-0.0005†
Indirect via PSP	0.0149	0.0193	-0.0090	0.0721

Note. PSP = Perfectionistic Self-Promotion. CI= Confidence Interval. †Confidence Interval does not include zero suggesting significant mediation.

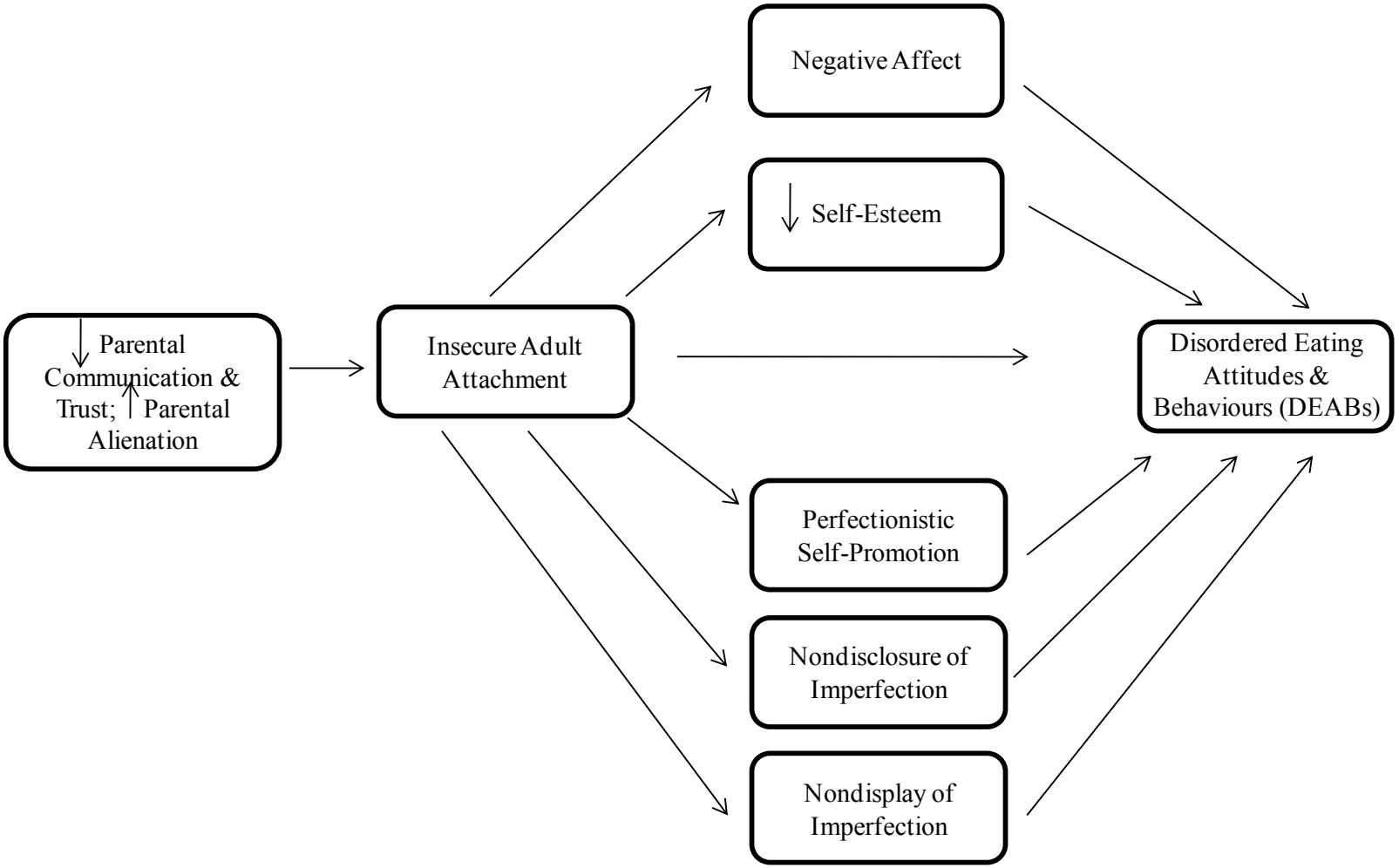
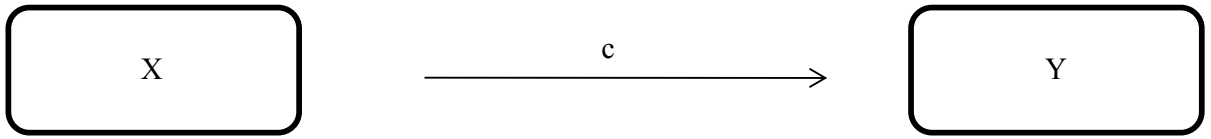
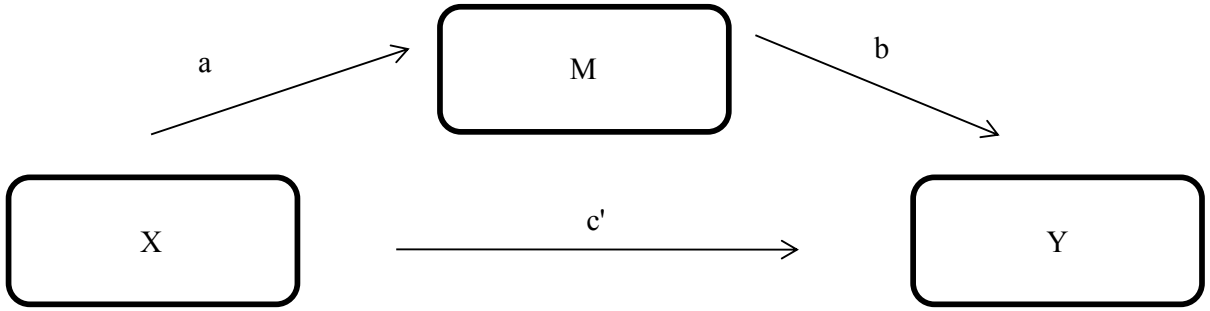


Figure 1. Hypothesized pathways by which perception of parental attachment relationship and insecure attachment are associated with disordered eating attitudes and behaviours (DEABs).



a. Direct Pathway



b. Indirect Pathway

Figure 2. a) Illustration of a direct effect where X affects Y. b) Illustration of a mediation design where X is hypothesized to exert an indirect effect on Y through M.

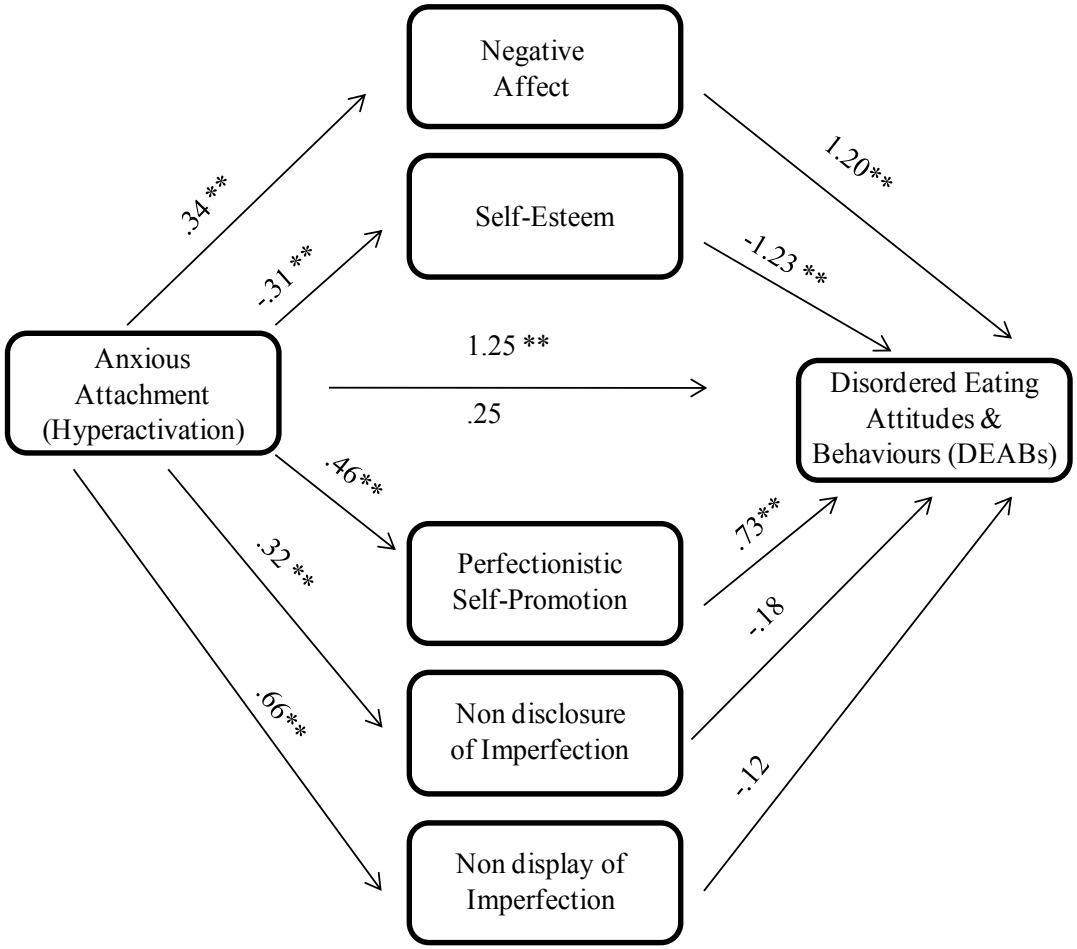


Figure 3. Mediation of the effect of Anxious Attachment on DEABs through Negative Affect, Self-Esteem, and Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection. The unstandardized regression coefficient above the path from Anxious Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. Coefficients significantly different from zero are indicated by an asterisk, $^{**}p < .001$.

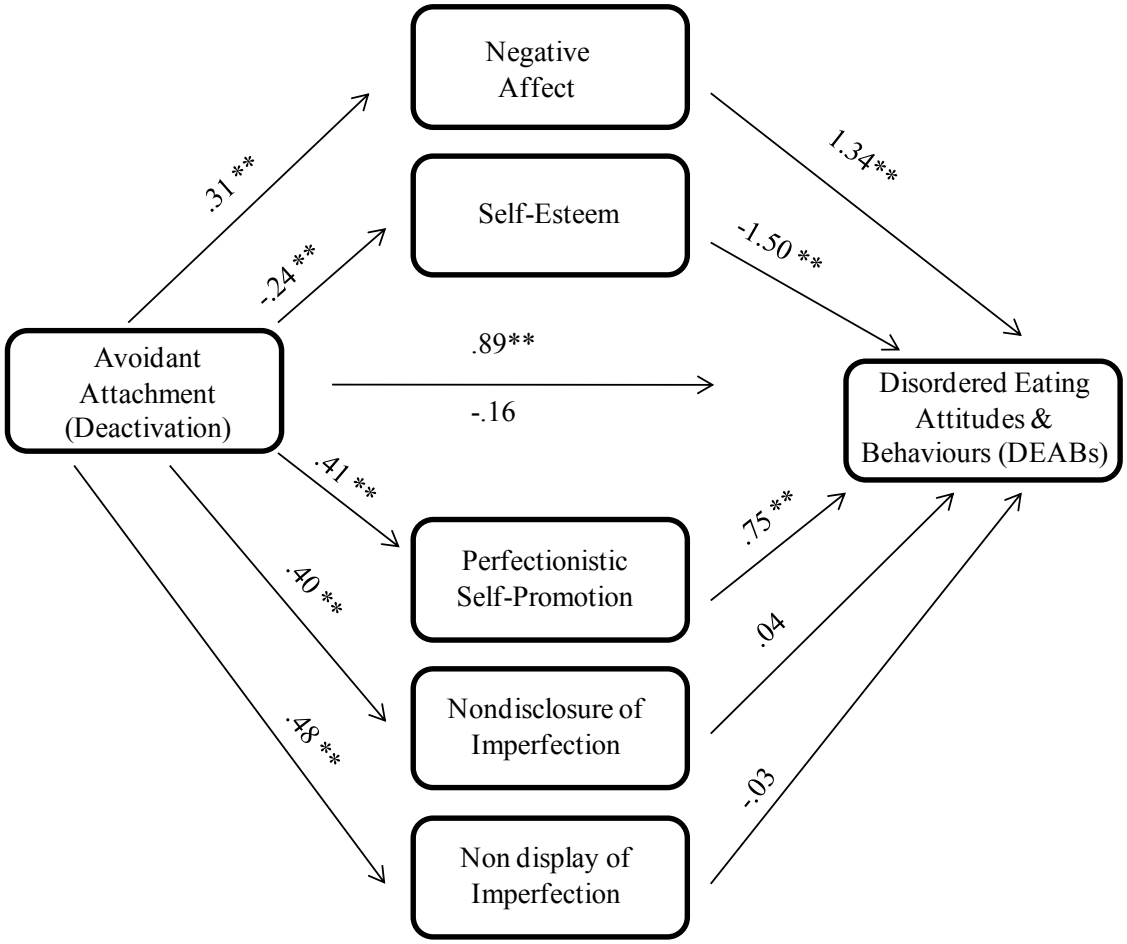


Figure 4. Mediation of the effect of Avoidant Attachment on DEABs through Negative Affect, Self-Esteem, and Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection. The unstandardized regression coefficient above the path from Avoidant Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. Coefficients significantly different from zero are indicated by an asterisk, $^{**}p < .001$.

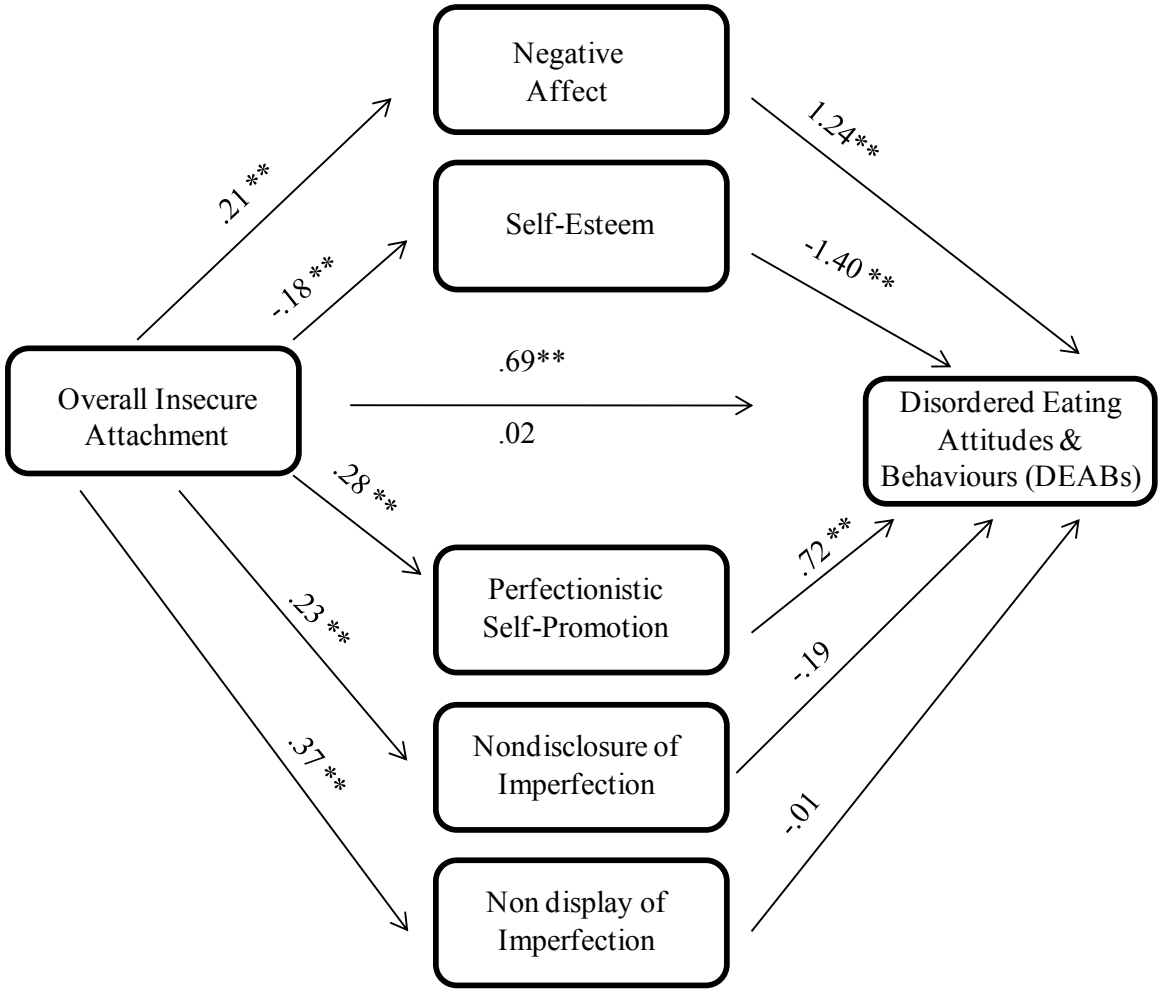


Figure 5. Mediation of the effect of Overall Insecure Attachment on DEABs through Negative Affect, Self-Esteem, and Perfectionistic Self-Promotion, Nondisplay of Imperfection, and Nondisclosure of Imperfection. The unstandardized regression coefficient above the path from Overall Insecure Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. Coefficients significantly different from zero are indicated by an asterisk, $^{**}p < .001$.

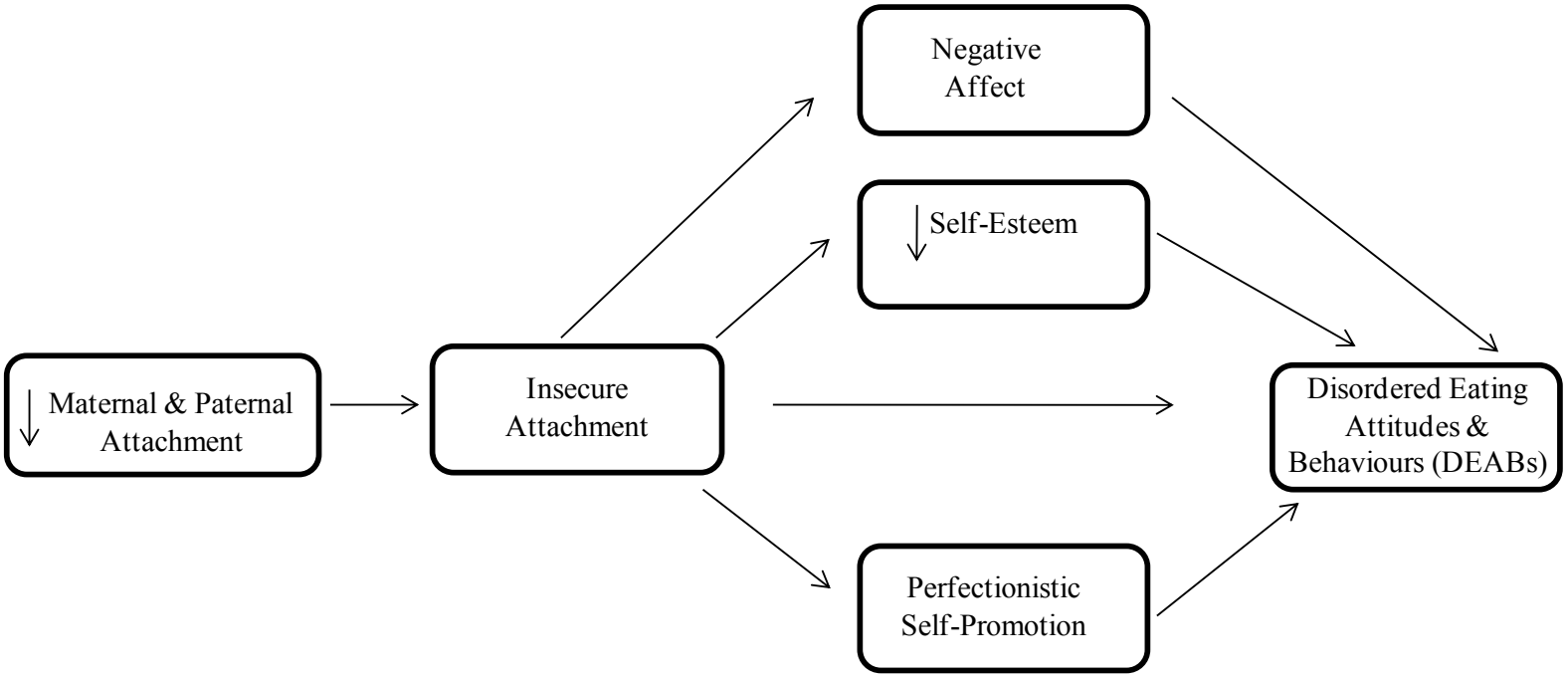


Figure 6. Pathways by which maternal and paternal attachment and insecure attachment are associated with disordered eating attitudes and behaviours (DEABs).

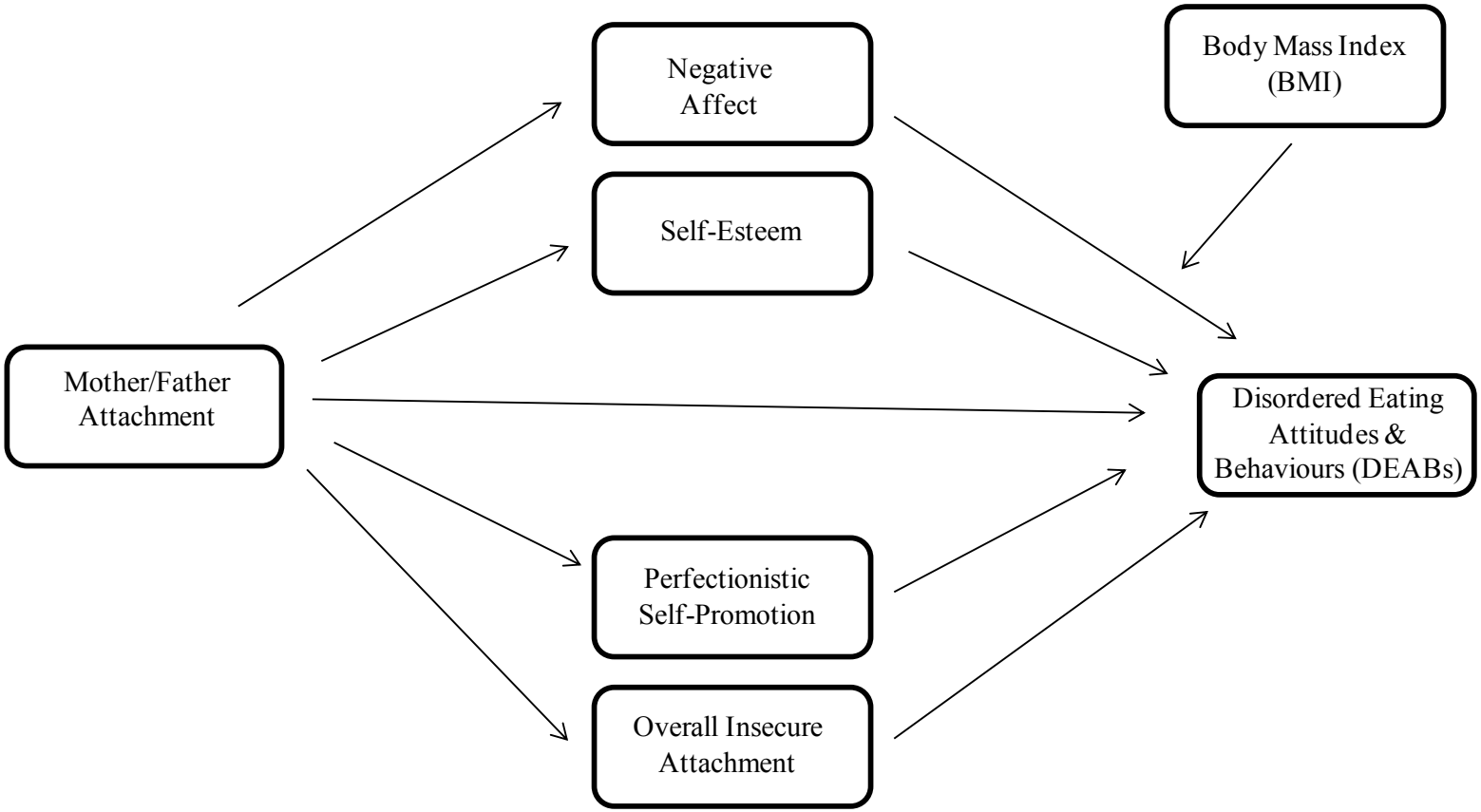


Figure 7. Hypothesized pathways by which BMI moderates the mediation of the effect of Mother/Father Attachment on DEABs through Negative Affect, Self-Esteem, Perfectionistic Self-Promotion, and Overall Insecure Attachment.

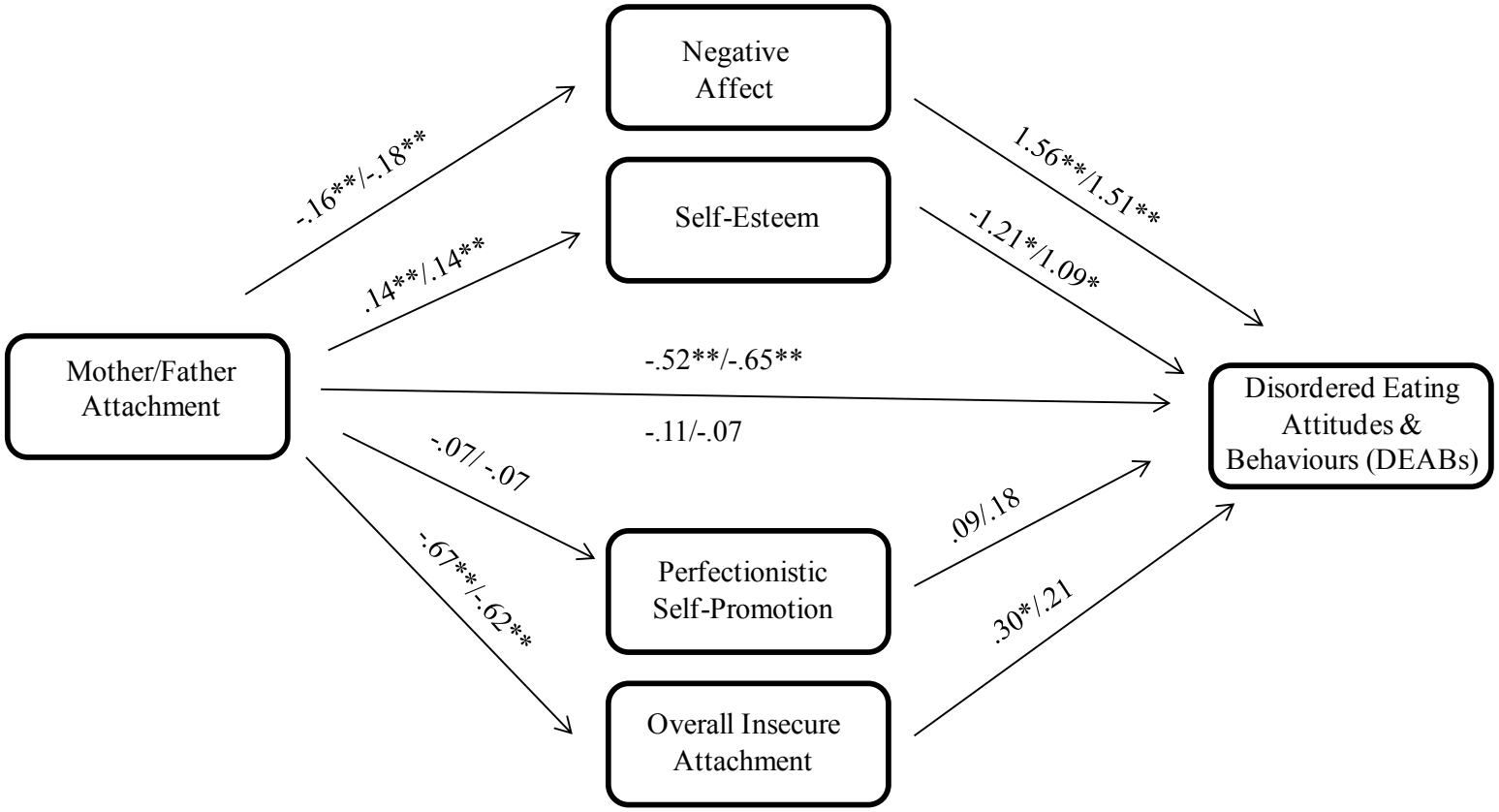


Figure 8. Mediation of the effect of Mother and Father Attachment on DEABs through Negative Affect, Self-Esteem, Perfectionistic Self-Promotion, and Overall Insecure Attachment. The first unstandardized regression coefficient is for Mother Attachment; the second coefficient is for Father Attachment. The coefficient above the path from Mother/Father Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. *p <.05. **p <.001.

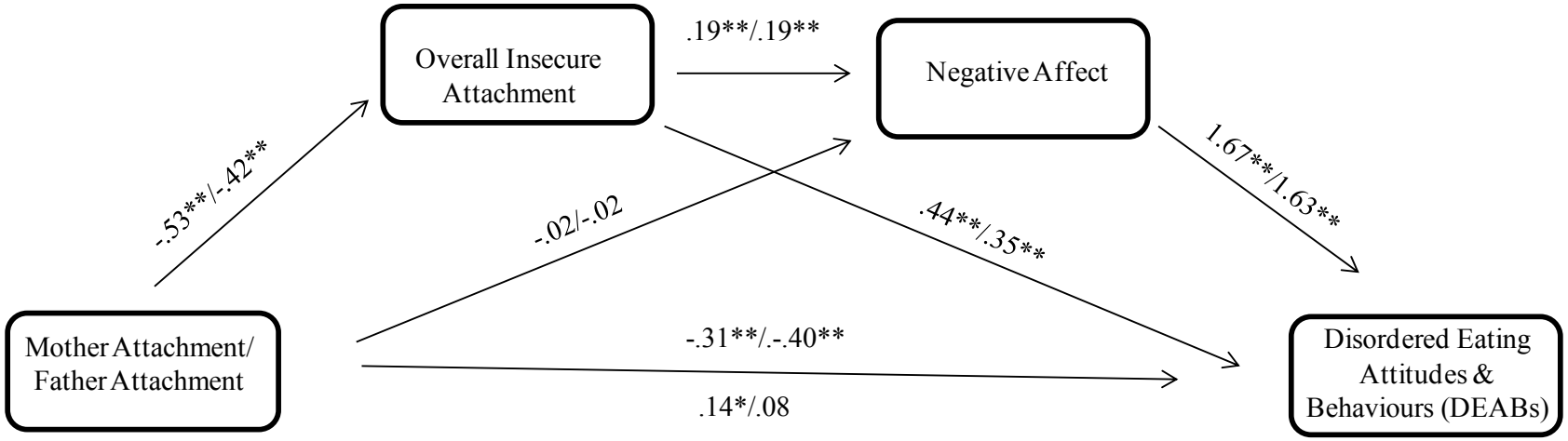


Figure 9. Serial multiple mediation of the effect of Mother and Father Attachment on DEABs through Overall Insecure Attachment and Negative Affect for combined sample. The first unstandardized regression coefficient is for Mother Attachment; the second coefficient is for Father Attachment. The coefficient above the path from Mother/Father Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. *p <.05. **p <.001.

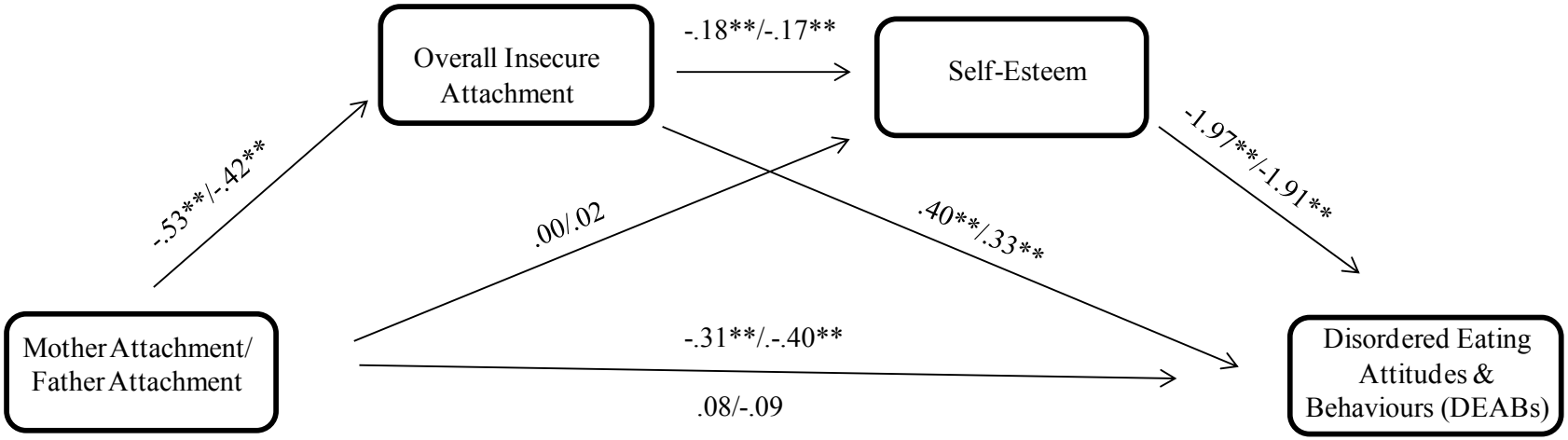


Figure 10. Serial multiple mediation of the effect of Mother and Father attachment on DEABs through Overall Insecure Attachment and Self-Esteem for combined sample. The first unstandardized regression coefficient is for Mother Attachment; the second coefficient is for Father Attachment. The coefficient above the path from Mother/Father Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. $^{**}p < .001$.

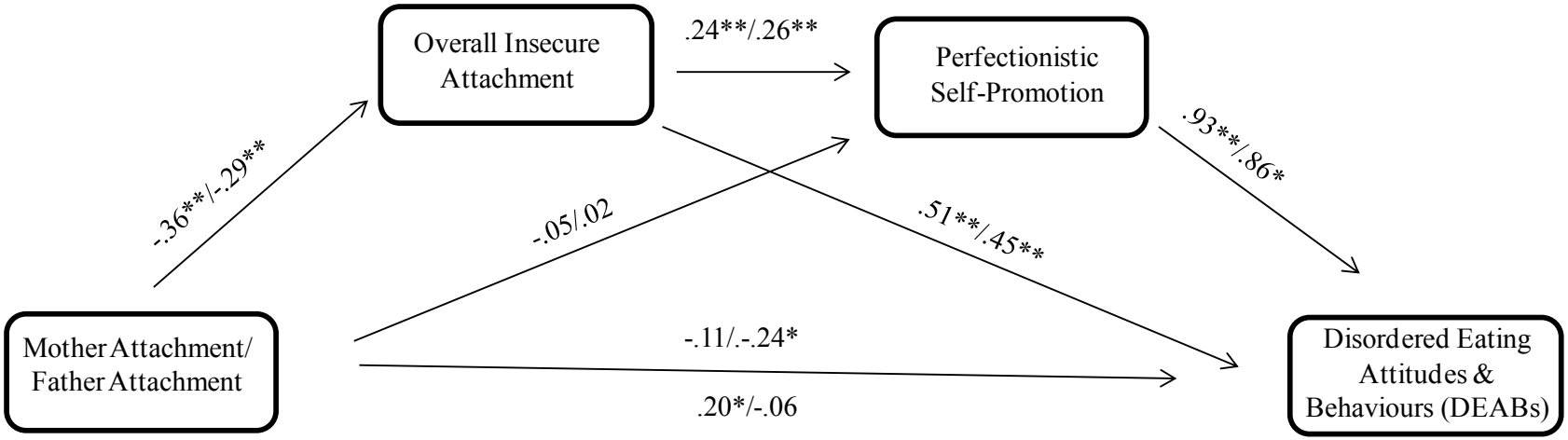


Figure 11. Serial multiple mediation of the effect of Mother and Father Attachment on DEABs through Overall Insecure Attachment and Perfectionistic Self-Promotion for university participants. The first unstandardized regression coefficient is for Mother Attachment; the second coefficient is for Father Attachment. The coefficient above the path from Mother/Father Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. *p <.05. **p <.001.

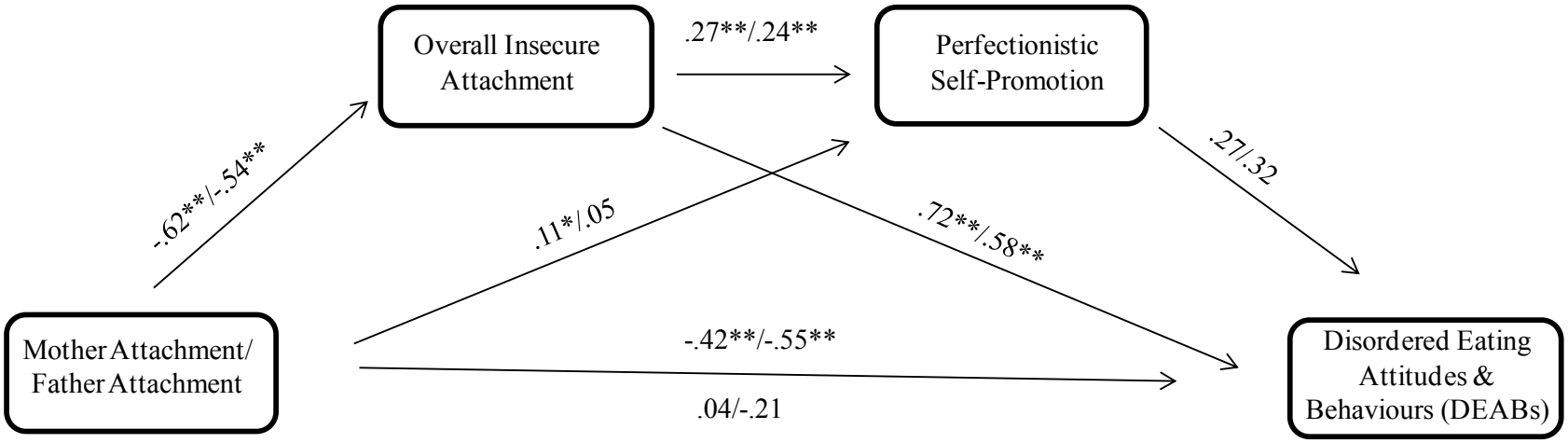


Figure 12. Serial multiple mediation of the effect of Mother and Father Attachment on DEABs through Overall Insecure Attachment and Perfectionistic Self-Promotion for high school participants. The first unstandardized regression coefficient is for Mother Attachment; the second coefficient is for Father Attachment. The coefficient above the path from Mother/Father Attachment to DEABs represents the direct effect with no mediators in the model; the coefficient below this path represents the direct effect when the mediators are included in the model. *p <.05. **p <.001.

Appendix A

Inventory of Parent and Peer Attachment (IPPA)

This questionnaire asks about your relationships with important people in your life: your mother, your father, and your friends. Please read the directions to each part carefully.

Some of the following questions are about your feelings about your **MOTHER** or the person who acted as your mother. If you have more than one person acting as your mother (e.g., a natural mother and a step-mother) answer the questions for the one you feel has most influenced you.

Please read each statement and circle **ONE** number that tells how true the statement is for you now.

1 = almost never or never true
2 = not very often true
3 = sometimes true
4 = often true
5 = almost always or always true

1. My mother respects my feelings.	1	2	3	4	5
2. I feel my mother does a good job as my mother.	1	2	3	4	5
3. I wish I had a different mother.	1	2	3	4	5
4. My mother accepts me as I am.	1	2	3	4	5
5. I like to get my mothers' point of view on things I'm concerned about.	1	2	3	4	5
6. I feel it's no use letting my feelings show around my mother.	1	2	3	4	5
7. My mother can tell when I'm upset about something.	1	2	3	4	5
8. Talking over my problems with my mother makes me feel ashamed or foolish.	1	2	3	4	5
9. My mother expects too much from me.	1	2	3	4	5
10. I get upset easily around my mother.	1	2	3	4	5
11. I get upset a lot more than my mother knows about.	1	2	3	4	5
12. When we discuss things, my mother cares about my point of view.	1	2	3	4	5
13. My mother trusts my judgement.	1	2	3	4	5
14. My mother has her own problems, so I don't bother her with mine.	1	2	3	4	5
15. My mother helps me to understand myself better.	1	2	3	4	5
16. I tell my mother about my problems and troubles.	1	2	3	4	5
17. I feel angry with my mother.	1	2	3	4	5
18. I don't get much attention from my mother.	1	2	3	4	5
19. My mother helps me to talk about my difficulties.	1	2	3	4	5
20. My mother understands me.	1	2	3	4	5
21. When I'm angry about something, my mother tries to understand me.					
22. I trust my mother.	1	2	3	4	5
23. My mother doesn't understand what I'm going through these days.	1	2	3	4	5
24. I can count on my mother when I need to get something off my chest.	1	2	3	4	5
25. If my mother knows something is bothering me, she asks me about it.	1	2	3	4	5

This questionnaire asks about your relationships with important people in your life: your mother, your father, and your friends. Please read the directions to each part carefully.

Some of the following questions are about your feelings about your **FATHER** or the person who acted as your father. If you have more than one person acting as your father (e.g., a natural father and a step-father) answer the questions for the one you feel has most influenced you.

Please read each statement and circle **ONE** number that tells how true the statement is for you now.

1 = almost never or never true
2 = not very often true
3 = sometimes true
4 = often true
5 = almost always or always true

1. My father respects my feelings.	1	2	3	4	5
2. I feel my father does a good job as my father.	1	2	3	4	5
3. I wish I had a different father.	1	2	3	4	5
4. My father accepts me as I am.	1	2	3	4	5
5. I like to get my fathers' point of view on things I'm concerned about.	1	2	3	4	5
6. I feel it's no use letting my feelings show around my father.	1	2	3	4	5
7. My father can tell when I'm upset about something.	1	2	3	4	5
8. Talking over my problems with my father makes me feel ashamed or foolish.	1	2	3	4	5
9. My father expects too much from me.	1	2	3	4	5
10. I get upset easily around my father.	1	2	3	4	5
11. I get upset a lot more than my father knows about.	1	2	3	4	5
12. When we discuss things, my father cares about my point of view.	1	2	3	4	5
13. My father trusts my judgement.	1	2	3	4	5
14. My father has his own problems, so I don't bother him with mine.	1	2	3	4	5
15. My father helps me to understand myself better.	1	2	3	4	5
16. I tell my father about my problems and troubles.	1	2	3	4	5
17. I feel angry with my father.	1	2	3	4	5
18. I don't get much attention from my father.	1	2	3	4	5
19. My father helps me to talk about my difficulties.	1	2	3	4	5
20. My father understands me.	1	2	3	4	5
21. When I am angry about something, my father tries to understand me.	1	2	3	4	5
22. I trust my father.	1	2	3	4	5
23. My father doesn't understand what I'm going through these days.	1	2	3	4	5
24. I can count on my father when I need to get something off my chest.	1	2	3	4	5
25. If my father knows something is bothering me, he asks me about it.	1	2	3	4	5

Appendix B

Attachment Style Questionnaire (ASQ)[4]

Show how much you agree with each of the following items by rating them on this scale:

1 = totally disagree
2 = strongly disagree
3 = slightly disagree
4 = slightly agree
5 = strongly agree
6 = totally agree

	Disagree				**Agree**	
1. Overall I am a worthwhile person.	1	2	3	4	5	6
2. I am easier to get to know than most people.	1	2	3	4	5	6
3. I feel confident that other people will be there for me when I need them.	1	2	3	4	5	6
4. I prefer to depend on myself than other people.	1	2	3	4	5	6
5. I prefer to keep to myself.	1	2	3	4	5	6
6. To ask for help is to admit that you're a failure.	1	2	3	4	5	6
7. People's worth should be judged by what they achieve.	1	2	3	4	5	6
8. Achieving things is more important than building relationships.	1	2	3	4	5	6
9. Doing your best is more important than getting on with others.	1	2	3	4	5	6
10. If you've got a job to do, you should do it no matter who gets hurt.	1	2	3	4	5	6

[4] Items used in two-dimensional scoring yielding Avoidance (3R, 4, 5, 8, 9, 10, 14, 16, 17, 19R, 20R, 21R, 23, 25, 34, 37R) and Anxiety (11, 13, 15, 18, 22, 24, 27, 29, 30, 31R, 32, 33, 38R) subscales. R= reverse scored.

11. It's important to me that others like me.	1	2	3	4	5	6
12. It's important to me to avoid doing things that others won't like.	1	2	3	4	5	6
13. I find it hard to make a decision unless I know what other people think.	1	2	3	4	5	6
14. My relationships with others are generally superficial.	1	2	3	4	5	6
15. Sometimes I think I am no good at all.	1	2	3	4	5	6
16. I find it hard to trust other people.	1	2	3	4	5	6
17. I find it difficult to depend on others.	1	2	3	4	5	6
18. I find that others are reluctant to get as close as I would like.	1	2	3	4	5	6
19. I find it relatively easy to get close to other people.	1	2	3	4	5	6
20. I find it easy to trust others.	1	2	3	4	5	6
21. I feel comfortable depending on other people.	1	2	3	4	5	6
22. I worry that others won't care about me as much as I care about them.	1	2	3	4	5	6
23. I worry about people getting too close.	1	2	3	4	5	6
24. I worry that I won't measure up to other people.	1	2	3	4	5	6
25. I have mixed feelings about being close to others.	1	2	3	4	5	6
26. While I want to get close to others, I feel uneasy about it.	1	2	3	4	5	6
27. I wonder why people would want to be involved with me.	1	2	3	4	5	6

28. It's very important to me to have a close relationship.	1	2	3	4	5	6
29. I worry a lot about my relationships.	1	2	3	4	5	6
30. I wonder how I would cope without someone to love me.	1	2	3	4	5	6
31. I feel confident about relating to others.	1	2	3	4	5	6
32. I often feel left out or alone.	1	2	3	4	5	6
33. I often worry that I do not really fit in with other people.	1	2	3	4	5	6
34. Other people have their own problems, so I don't bother them with mine.	1	2	3	4	5	6
35. When I talk over my problems with others, I generally feel ashamed or foolish.	1	2	3	4	5	6
36. I am too busy with other activities to put much time into relationships.	1	2	3	4	5	6
37. If something is bothering me, others are generally aware and concerned.	1	2	3	4	5	6
38. I am confident that other people will like and respect me.	1	2	3	4	5	6
39. I get frustrated when others are not available when I need them.	1	2	3	4	5	6
40. Other people often disappoint me.	1	2	3	4	5	6

Appendix C

Eating Disorder Examination Questionnaire (EDE-Q)

Instructions

The following questions are concerned with the **PAST FOUR WEEKS ONLY** (**28 DAYS**). Please read each question carefully and circle the number on the right. Please answer ALL the questions.

EXAMPLES:							
ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…….	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every Day
…Have you tried to eat vegetables?	0	1	2	3	4	5	6
…How many times have you walked to school?	0	1	2	3	4	5	6

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…..	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every Day
1. ….Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2. …Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6

3. …Have you tried to avoid eating any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4. …Have you ever tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6
ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…..	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every Day
5. …Have you wanted your stomach to be empty?	0	1	2	3	4	5	6
6. …Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
7. …Have you been afraid of losing control over your eating?	0	1	2	3	4	5	6
8. …Have you had episodes of binge eating?	0	1	2	3	4	5	6

9. …Have you eaten in secret? (Do not count binges.)	0	1	2	3	4	5	6
10. …Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6
11. …Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
12. …Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
13. …Have you felt fat?	0	1	2	3	4	5	6
14. …Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

OVER THE PAST 4 WEEKS (28 DAYS)...

15. ...How often have you felt guilty after eating because of the effect on your shape and weight (Do not count binges). (Circle the number that applies.)	0. None of the times 1. A few of the times 2. Less than half the times 3. Half the times 4. More than half the times 5. Most of the time 6. Every time

16. ...Have there been any times when you have eaten what other people would regard as an unusually large amount of food given the circumstances? (Please circle appropriate number).	0- NO 1- YES
17. …...How many such episodes have you had over the past four weeks? (Please write the appropriate number.)	_____
18. …...During how many of these episodes of overeating did you have a sense of having lost control?	_____
19. …....Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?	0- NO 1- YES
20. … How many such episodes have you had over the past four weeks?	_____

21. …...Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight? 22. ……How many times have you done this over the past four weeks?	0- NO 1- YES _____
23. ….Have you taken laxatives as a means of controlling your shape or weight? 24. ….How many times have you done this over the past four weeks?	0- NO 1- YES _____
25. ...Have you taken diuretics (water tablets) as a means of controlling your shape or weight? 26. ...How many times have you done this over the past four weeks?	0- NO 1- YES _____
27. ...Have you exercised hard as a means of controlling your shape or weight? 28. ...How many times have you done this over the past four weeks?	0- NO 1- YES _____

OVER THE PAST FOUR WEEKS (28 DAYS)... (Please circle the number which best describes your behaviour)	NOT AT ALL		SLIGHTLY		MODERATELY		MARKEDLY
29. ....Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
30. ....Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
31. ...How much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1	2	3	4	5	6
32. ...How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
33. ….How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6
34. …How concerned have you been about other people seeing you eat?	0	1	2	3	4	5	6

35.	....How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?	0	1	2	3	4	5	6
36.	...How uncomfortable have you felt about others seeing your body; for example, in shared changing rooms, when swimming or wearing tight clothes?	0	1	2	3	4	5	6

37. How much do you weigh? If uncertain please give your best estimate. _____ lbs or kilos (circle one)

38. How much would you like to weigh? _____lbs or kilos (circle one)

39. How tall are you? If uncertain please give your best estimate. ____ ft ____ in OR ____ m _____ cm

40. Over the past 3 months, how many menstrual periods have you missed?

    0 1 2 3 N/A

41. Have you been taking birth control pills during the past 3 months? YES NO

42. What is your current age? _____

Appendix D

Rosenberg Self-Esteem Scale (RSES)

Please circle the appropriate answer per item. Use the following scale:

1 = Strongly Agree; 2 = Agree; 3 = Disagree; 4 = Strongly disagree

1.	On the whole, I am satisfied with myself.	1	2	3	4
2.	At times I think I am no good at all.	1	2	3	4
3.	I feel that I have a number of good qualities.	1	2	3	4
4.	I am able to do things as well as most other people	1	2	3	4
5.	I feel I do not have much to be proud of.	1	2	3	4
6.	I certainly feel useless at times.	1	2	3	4
7.	I feel that I'm a person of worth, at least on an equal plane as others.	1	2	3	4
8.	I wish I could have more respect for myself.	1	2	3	4
9.	All in all, I am inclined to feel that I am a failure.	1	2	3	4
10.	I take a positive attitude toward myself.	1	2	3	4

Appendix E

Positive and Negative Affect Schedule (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way in the past few weeks. Please indicate which rating best applies to you by circling the response:

1 = Very slightly or not at all; 2 = A little; 3 = Moderately; 4 = Quite a bit; 5 = Extremely

Scared	1	2	3	4	5
Nervous	1	2	3	4	5
Jittery	1	2	3	4	5
Irritable	1	2	3	4	5
Hostile	1	2	3	4	5
Afraid	1	2	3	4	5
Guilty	1	2	3	4	5
Ashamed	1	2	3	4	5
Attentive	1	2	3	4	5
Interested	1	2	3	4	5
Alert	1	2	3	4	5
Excited	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Inspired	1	2	3	4	5
Proud	1	2	3	4	5
Upset	1	2	3	4	5
Distressed	1	2	3	4	5
Determined	1	2	3	4	5
Strong	1	2	3	4	5
Active	1	2	3	4	5

Appendix F

Perfectionistic Self-Presentation Scale (PSPS)[5]

Listed below are a group of statements. Please rate your agreement with each of the statements using the following scale. If you strongly agree, circle 7; if you disagree, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

	Disagree Strongly			**Neutral**			**Agree Strongly**
1. It is okay to show others that I am not perfect.	1	2	3	4	5	6	7
2. I judge myself based on the mistakes I make in front of other people.	1	2	3	4	5	6	7
3. I will do almost anything to cover up a mistake.	1	2	3	4	5	6	7
4. Errors are much worse if they are made in public rather than in private.	1	2	3	4	5	6	7
5. I try always to present a picture of perfection.	1	2	3	4	5	6	7
6. It would be awful if I made a fool of myself in front of others.	1	2	3	4	5	6	7
7. If I seem perfect, others will see me more positively.	1	2	3	4	5	6	7
8. I brood over mistakes that I have made in front of others.	1	2	3	4	5	6	7
9. I never let others know how hard I work on things.	1	2	3	4	5	6	7
10. I would like to appear more competent than I really am.	1	2	3	4	5	6	7
11. It doesn't matter if there is a flaw in my looks.	1	2	3	4	5	6	7
12. I do not want people to see me do something unless I am very good at it.	1	2	3	4	5	6	7
13. I should always keep my problems to myself.	1	2	3	4	5	6	7
14. I should solve my own problems rather than admit them to others.	1	2	3	4	5	6	7

[5]Items on the Perfectionistic Self-Promotion subscale are in bold. Only these items were included in Study 2.

15. I must appear to be in control of my actions at all times.	1	2	3	4	5	6	7
16. It is okay to admit mistakes to others.	1	2	3	4	5	6	7
17. It is important to act perfectly in social situations.	1	2	3	4	5	6	7
18. I don't really care about being perfectly groomed.	1	2	3	4	5	6	7
19. Admitting failure to others is the worst possible thing.	1	2	3	4	5	6	7
20. I hate to make errors in public.	1	2	3	4	5	6	7
21. I try to keep my faults to myself.	1	2	3	4	5	6	7
22. I do not care about making mistakes in public.	1	2	3	4	5	6	7
23. I need to be seen as perfectly capable in everything I do.	1	2	3	4	5	6	7
24. Failing at something is awful if other people know about it.	1	2	3	4	5	6	7
25. It is very important that I always appear to be "on top of things".	1	2	3	4	5	6	7
26. I must always appear to be perfect.	1	2	3	4	5	6	7
27. I strive to look perfect to others.	1	2	3	4	5	6	7

Appendix G

Participant Information Letter (Study 1)

Dear Participant,

Thank you for your interest in this research study. I am a PhD student in clinical psychology at LU, supervised by Dr. Ron Davis, Registered Psychologist. The purpose of this study is to see how relationships influence eating attitudes and behaviours. In the pages that follow, you will find a series of questionnaires asking about how you feel about yourself, your emotions, your eating attitudes and behaviours, and your relationship with others, including parental figures. It will take approximately 45 minutes to 1 hour to complete all the questionnaires. Please answer all questions as honestly as you can.

Your participation in this study is completely voluntary. You may withdraw at any time without penalty. All information you provide will be kept anonymous. Your name will appear only on the consent form and not on any of the pages of the questionnaire itself. Your consent form will be stored separately from the questionnaires. The information you provide will be coded, analysed, and securely stored at Lakehead University for seven years. No individual will be identified in any report of the results. The results will be shared with the Psychology department at Lakehead University and an article will be prepared for publication in an academic journal.

If you wish to take part in this project, please read and sign the attached consent form. If you are under the age of 18, you must also have your parent or legal guardian sign a consent form in order for you to participate in this project. Please ensure that you have obtained this form from the researcher.

Sincerely,

Lezlie Gomes, M.A.
Ph.D Candidate

Appendix H

Participant Consent Form (Study 1)

My signature below indicates that I have read the attached information sheet and that I have had the opportunity to receive satisfactory answers from the primary researcher, Lezlie Gomes, as to any questions that I might have about participation in this project.

Signing this form indicates that I understand and agree to the following:

I am a volunteer and can withdraw at any time from the project without penalty of any kind.

There are no expected risks associated with participation in this project.

The information I provide by way of my responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 7 years.

I may receive a summary of the project, upon request, following its completion.

If I am under the age of 18 at time of participation in the project, I am required to present to project personnel a separate form signed by my parent or legal guardian giving their permission for me to participate. That consent is in addition to the consent that I am giving on this form.

_____	_____
Name of Participant (please print)	Date of Birth
_____	_____
Signature of Participant	Date
_____	_____
Student Number	Name of Psyc 1100 Professor (if applicable)

Appendix I

Parent/Guardian Information Letter for Phase 3 of Turning Points (Study 1)

The Ontario Ministry of Health and Long-Term Care has provided our project team with funds to develop a video program that is intended to encourage healthy lifestyle choices among young women. We have just completed the video and now we want to determine the degree to which it might be of help. The program is intended for young women who currently have some personal concerns about their own eating attitudes, behaviours, and/or body image.

If you decide that you will give permission for your daughter to participate, then she would be invited to attend a series of 14 1-hour group sessions involving other young women like herself. The group will be facilitated by professional counselors from your own community. In the groups your daughter would see a video, engage in group activities and discussion about healthy lifestyle choices regarding eating behaviours and attitudes, nutrition, body image, physical activity, mood regulation, and interpersonal relationships with peers and parents.

Your daughter would complete a number of questionnaires before the group begins, immediate after the sessions have finished, and again 3 months later. The questionnaires are designed to help us determine whether the group experience has been of benefit to those who participate. Those questionnaires will cover a variety of issues like eating attitudes and behaviours, mood and esteem, and quality of relationships.

Participation in this project is completely voluntary. Individuals who initially volunteer can subsequently withdraw at any time without penalty.

If you wish your daughter to take part in this project, please read and sign the attached consent form. Your daughter must also give her own signed consent to voluntarily participate on a separate form from the one that you sign. Your daughter will bring both signed forms to the first group meeting.

If you would like to learn more about this project, and/or how your daughter can participate, feel free to contact for a confidential discussion Lezlie Gomes, group coordinator at xxx-xxxx, in the Department of Psychology, Lakehead University, Thunder Bay Ontario.

Appendix J

Parent/Guardian Consent Form for Phase 3 of Turning Points (Study 1)

My signature below indicates that I have read the attached information sheet and that I have had the opportunity to discuss this with my daughter.

Signing this form indicates that I understand and agree to the following:

My daughter is a volunteer and can withdraw at any time from the project without penalty of any kind.

There are no expected risks associated with your daughter's participation in this project.

The information that my daughter provides by way of her responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 7 years.

I may receive a summary of the project, upon request, following its completion.

My daughter is required to present to project personnel a separate consent form signed by her signifying her own consent to participate. That consent is in addition to the consent that I am giving on this form.

_____ _____

Daughter's name (please print) Parent/Guardian name (please print)

_____ _____

Signature of Parent/Guardian Date

Appendix K

Participant Information Letter for Phase 3 of Turning Points (Study 1)

The Ontario Ministry of Health and Long-Term Care has provided our project team with funds to develop a video program that is intended to encourage healthy lifestyle choices among young women. We have just completed the video and now we want to determine the degree to which it might be of help. The program is intended for young women who currently have some personal concerns about their own eating attitudes, behaviours, and/or body image.

If you decide to participate, then you would be invited to attend a series of 14 1-hour group sessions involving other young women like yourself. The group will be facilitated by professional counselors from your own community. In the groups you would see a video, engage in group activities and discussion about healthy lifestyle choices regarding eating behaviours and attitudes, nutrition, body image, physical activity, mood regulation, and interpersonal relationships with peers and parents.

You would complete a number of questionnaires before the group begins, immediate after the sessions have finished, and again 3 months later. The questionnaires are designed to help us determine whether the group experience has been of benefit to those who participate. Those questionnaires will cover a variety of issues like eating attitudes and behaviours, mood and esteem, and quality of relationships.

Participation in this project is completely voluntary. Individuals who initially volunteer can subsequently withdraw at any time without penalty.

If you wish to take part in this project, please read and sign the attached consent form. If you are under the age of 18, you must also have your parent or legal guardian sign the attached consent form in order for you to participate in this project.

Please bring the appropriately signed consent form to first group meeting to take place in room _____at_____ on _____at_____.

If you would like to learn more about this project, and/or how you can participate, feel free to contact for a confidential discussion Lezlie Gomes, group coordinator at xxx-xxxx, in the Department of Psychology, Lakehead University, Thunder Bay Ontario.

Appendix L

Participant Consent Form for Phase 3 of Turning Points (Study 1)

My signature below indicates that I have read the attached information sheet and that I have had the opportunity to receive satisfactory answers from project personnel as to any questions that I might have about participation in this project.

Signing this form indicates that I understand and agree to the following:

I am a volunteer and can withdraw at any time from the project without penalty of any kind.

There are no expected risks associated with participation in this project.

The information I provide by way of my responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 7 years.

I may receive a summary of the project, upon request, following its completion.

If I am under the age of 18 at time of participation in the project, I am required to present to project personnel a separate form signed by my parent or legal guardian giving their permission for me to participate. That consent is in addition to the consent that I am giving on this form.

_____ _____

Name of Participant (please print) Date of Birth

_____ _____

Signature of Participant Date

_____ _____

E-mail Address Telephone number

Appendix M

School Information Letter (Study 2)

Dear

My name is Lezlie Gomes. I am a doctoral student in Clinical Psychology at Lakehead University under the supervision of Dr. Ron Davis. I am conducting a research study on the factors that influence the development of eating attitudes and behaviours in adolescent females. I would like to include Grade 9 and 10 Health and Physical Education students from _____ High School in my study.

If you decide to give permission for your school to participate, I will contact the Health and Physical Education teachers to discuss the possibility of their students' participation in the project and to arrange a mutually convenient time to visit their class(es). The purpose of the initial visit will be to explain to students the purpose of the study, risks and benefits to participation, their rights as participants and to answer any questions. Participant and parent/guardian information letters and consent forms will be given to those students interested in participating. This initial visit will take approximately 30 minutes. I will return approximately one week later for interested students with signed consent forms to complete a number of questionnaires. The questionnaires will cover a variety of issues such as eating attitudes and behaviours, mood, self-esteem, perfectionism, and quality of relationships. To protect the integrity of the data, these questionnaires will be completed during class time and will take approximately 45 minutes.

Participation in this project is completely voluntary. Students who initially volunteer can subsequently withdraw anytime without penalty or consequence up until their completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, we would be unable to locate the information specific to a particular participant if someone chose to withdraw after submission.

Students may decline to answer any question that they are not comfortable answering. The information they provide by way of their responses on the questionnaires will be anonymous and remain confidential. Names will not be attached to the completed questionnaire packages. Consent forms and completed questionnaires will be securely stored separately in the Department of Psychology at Lakehead University for 5 years. Only members of the research team will have access to the completed questionnaires. The results of this project will be part of a doctoral dissertation and may be communicated in peer-reviewed venues such as scientific conferences and publications. Participants will remain anonymous in any publication or public presentation of research findings.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that students may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of them in the questionnaires; for example, mood, self-esteem,

quality of important relationships. We will provide students with the contact information for the Student Services Department at _____ High School to discuss any such reactions with a school counselor.

Students who wish to take part in the project will need to read and sign a consent form. Students under the age of 18 must also have a parent or legal guardian sign an additional consent form and submit it to me before they will be permitted to participate in the project.

This research study has been reviewed and approved by the _____School Board and the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) xxx-xxxx or research@lakeheadu.ca.

Results for this project will be available by September 2014. If you would like further information about this project or a summary of research results when available, feel free to contact me at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

If you wish for your school to take part in this project, please read and sign the attached consent form. I will be in touch to discuss the inclusion of your school in our project.

Thank you,

Lezlie Gomes, M.A.
Doctoral Candidate
Department of Psychology, Lakehead University

Appendix N

School Consent Form (Study 2)

My signature below indicates that I have read the attached information sheet and that I grant permission for _____ High School to participate in the research project.

Signing this form indicates that I understand and agree to the following:

Lezlie Gomes, a doctoral student supervised by Dr. Ron Davis in the Department of Psychology at Lakehead University, will visit class(es) on two different occasions to invite females students to participate in a research project examining the factors that influence disordered eating and behaviours.

The first visit will take approximately 30 minutes of class time where the researcher will discuss the purpose, risks and benefits to participation, students' rights as participants and to answer any questions. Participant and parent/guardian information letters and consent forms will be given to those students interested in participating.

During the second visit approximately one week later, interested students with signed consent forms will complete a number of questionnaires. This will take approximately 45 minutes of class time. Both visits will be scheduled at mutually convenient times.

I may receive a summary of the project in September 2014 by contacting the researcher at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

_____	_____
School	Principal
_____	_____
Signature of Principal	Date

Appendix O

Teacher Information Letter (Study 2)

Dear Teacher:

My name is Lezlie Gomes. I am a doctoral student in Clinical Psychology at Lakehead University under the supervision of Dr. Ron Davis. I am conducting a research study on the factors that influence the development of eating attitudes and behaviours in adolescent females. I would like to include Health and Physical Education students from _____ High School in my study. Your principal has been contacted and has given permission for your school's participation in the study.

If you decide to give permission for your students to participate, I will briefly visit your class at a mutually convenient time to explain the purpose of the study, risks and benefits to participation, your students' rights as participants and to answer any questions. Participant and parent/guardian information letters and consent forms will be given to those students interested in participating. I will return approximately one week later for interested students with signed consent forms to complete a number of questionnaires. The questionnaires will cover a variety of issues such as eating attitudes and behaviours, mood, self-esteem, perfectionism, and quality of relationships. To protect the integrity of the data, these questionnaires will be completed during class time and will take approximately 45 minutes.

Participation in this project is completely voluntary. Students who initially volunteer can subsequently withdraw anytime without penalty or consequence up until their completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, we would be unable to locate the information specific to a particular participant if someone chose to withdraw after submission.

Students may decline to answer any question that they are not comfortable answering. The information they provide by way of their responses on the questionnaires will be anonymous and remain confidential. Names will not be attached to the completed questionnaire packages. Consent forms and completed questionnaires will be securely stored separately in the Department of Psychology at Lakehead University for 5 years. Only members of the research team will have access to the completed questionnaires. The results of this project will be part of a doctoral dissertation and may be communicated in peer-reviewed venues such as scientific conferences and publications. Participants will remain anonymous in any publication or public presentation of research findings.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that students may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of them in the questionnaires; for example, mood, self-esteem,

quality of important relationships. We will provide students with the contact information for the Student Services Department at _____ High School to discuss any such reactions with a school counselor.

Students who wish to take part in the project will need to read and sign a consent form. Students under the age of 18 must also have a parent or legal guardian sign an additional consent form and submit it to me before they will be permitted to participate in the project.

This research study has been reviewed and approved by the _____ School Board and the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or research@lakeheadu.ca.

Results for this project will be available by September 2014. If you would like further information about this project or a summary of research results when available, feel free to contact me at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

If you wish for your class to take part in this project, please read and sign the attached consent form. I will be in touch to discuss the inclusion of your class in our project.

Thank you,

Lezlie Gomes, M.A.
Doctoral Candidate
Department of Psychology, Lakehead University

Appendix P

Teacher Consent Form (Study 2)

My signature below indicates that I have read the attached information sheet and that I grant permission for my class(es) to participate in the research project.

Signing this form indicates that I understand and agree to the following:

Lezlie Gomes, a doctoral student supervised by Dr. Ron Davis in the Department of Psychology at Lakehead University, will visit my class(es) on two different occasions to invite females students to participate in a research project examining the factors that influence disordered eating and behaviours.

The first visit will take approximately 30 minutes of class time where the researcher will discuss the purpose, risks and benefits to participation, students' rights as participants and to answer any questions. Participant and parent/guardian information letters and consent forms will be given to those students interested in participating.

During the second visit approximately one week later, interested students with signed consent forms will complete a number of questionnaires. This will take approximately 45 minutes of class time. Both visits will be scheduled at mutually convenient times.

I may receive a summary of the project in September 2014 by contacting the researcher at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

_____ _____

School Teacher's Name (Please print)

_____ _____

Signature of Teacher Date

Appendix Q

Script for speaking to high school classes (Study 2)

My name is Lezlie Gomes. I am a doctoral student in Clinical Psychology at Lakehead University. I am being supervised by Dr. Ron Davis. I am doing a research study on the factors that influence the development of eating attitudes and behaviours in adolescent females. I would like to include you all in my study.

If you decide to participate, you will be invited to complete a number of questionnaires. They will cover a variety of issues such as eating attitudes and behaviours, mood, self-esteem, perfectionism, and quality of relationships. The questionnaires will be completed during class time and will take approximately 45 minutes.

Participation in this project is voluntary. If you volunteer, you can withdraw anytime without penalty or consequence up until you have submitted your completed questionnaire package. Because the questionnaires are anonymous, we would be unable to locate your questionnaire if you chose to withdraw after you submitted your package.

You may decline to answer any question that you are not comfortable answering. The information you provide by way of your responses on the questionnaires will be anonymous and remain confidential. Your name will not be attached to your completed questionnaire package. Consent forms and completed questionnaires will be securely stored separately in the Department of Psychology at Lakehead University for 5 years. Only members of the research team will have access to the completed questionnaires. The results of this project will be part of my dissertation and may be included in scientific conferences or publications. Participants will remain anonymous in any publication or public presentation of research findings.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that you may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of you in the questionnaires; for example, mood, self-esteem, quality of important relationships. If you would like to discuss any of your reactions, the contact information for your school counseling department is in the information letter.

If you wish to take part in this project, please carefully read the information letter and consent form. If you are under the age of 18, you must also have your parent or legal guardian sign the "Parent/Guardian Consent Form". You'll need to submit both consent forms to me in order to participate in this project.

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions about the ethics of this project and would like to speak to someone outside of the research team, the contact information for the Research Ethics Board is in the information letter.

Results will be available by September 2014. If you would like a summary of the results or if you'd like more information about this project, please feel free to call/text or email me. My contact information is in the letter. Thanks so much for your attention and for your consideration.

Appendix R

Parent/Guardian Information Letter (Study 2)

Dear Parent/Guardian:

My name is Lezlie Gomes. I am a doctoral student in Clinical Psychology at Lakehead University under the supervision of Dr. Ron Davis. I am conducting a research study on the factors that influence the development of eating attitudes and behaviours in adolescent females. I would like to include your daughter in my study.

If you decide to give permission for your daughter to participate, she will be invited to complete a number of questionnaires. The questionnaires will cover a variety of issues such as eating attitudes and behaviours, mood, self-esteem, perfectionism, and quality of relationships. These questionnaires will be completed during class time and will take approximately 45 minutes.

Participation in this project is completely voluntary. Individuals who initially volunteer can subsequently withdraw anytime without penalty or consequence up until their completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, we would be unable to locate the information specific to a particular participant if someone chose to withdraw after submission.

Your daughter may decline to answer any question that she is not comfortable answering. The information she provides by way of her responses on the questionnaires will be anonymous and remain confidential. Her name will not be attached to her completed questionnaire package. Consent forms and completed questionnaires will be securely stored separately in the Department of Psychology at Lakehead University for 5 years. Only members of the research team will have access to the completed questionnaires. This means that no one in your daughter's school (e.g., your daughter's teacher or principal) will have access to the completed questionnaires. The results of this project will be part of a doctoral dissertation and may be communicated in peer-reviewed venues such as scientific conferences and publications. Participants will remain anonymous in any publication or public presentation of research findings.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that your daughter may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of her in the questionnaires; for example, mood, self-esteem, quality of important relationships. My daughter may exercise her right to discuss any such reactions with a school counselor in the Student Services Department at _____High School at (807) xxx-xxxx.

If you wish your daughter to take part in this project, please read and sign the attached consent form. Your daughter must also give her own signed consent to voluntarily participate on a

separate form from the one that you sign.

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or research@lakeheadu.ca.

Results for this project will be available by September 2014. If you would like further information about this project or a summary of research results when available, feel free to contact me at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

Thank you,

Lezlie Gomes, M.A.
Doctoral Candidate
Department of Psychology, Lakehead University

Please sign the consent form on the following page and have your daughter return it to school as soon as possible. Thank you!

Appendix S

Parent/Guardian Consent Form (Study 2)

My signature below indicates that I have read the attached information sheet and that I have had the opportunity to discuss this with my daughter.

Signing this form indicates that I understand and agree to the following:

My daughter is a volunteer and can withdraw at any time from the project without penalty or consequence up until her completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, if she chooses to withdraw after submission, the researchers could not locate the information specific to her.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that my daughter may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of her in the questionnaires; for example, mood, self-esteem, quality of important relationships. My daughter may exercise her right to discuss any such reactions with a school counselor in the Student Services Department at _____ High School at (807) 625-8365.

The information provided by my daughter by way of her responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 5 years.

The information my daughter provides will remain anonymous in any publication or public presentation of research results. I may receive a summary of the project in September 2014 by contacting the researcher at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

My daughter is required to present to the researcher a separate consent form signed by her signifying her own consent to participate. That consent is in addition to the consent that I am giving on this form.

_____ _____

Daughter's name (please print) Parent/Guardian name (please print)

_____ _____

Signature of Parent/Guardian Date

Appendix T

Participant Information Letter (Study 2)

Dear Potential Participant:

My name is Lezlie Gomes. I am a doctoral student in Clinical Psychology at Lakehead University under the supervision of Dr. Ron Davis. I am conducting a research study on the factors that influence the development of eating attitudes and behaviours in adolescent females. I would like to include you in my study.

If you decide to participate, you will be invited to complete a number of questionnaires. The questionnaires will cover a variety of issues such as eating attitudes and behaviours, mood, self-esteem, perfectionism, and quality of relationships. These questionnaires will be completed during class time and will take approximately 45 minutes.

Participation in this project is completely voluntary. Individuals who initially volunteer can subsequently withdraw anytime without penalty or consequence up until their completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, we would be unable to locate the information specific to a particular participant if someone chose to withdraw after submission.

You may decline to answer any question that you are not comfortable answering. The information you provide by way of your responses on the questionnaires will be anonymous and remain confidential. Your name will not be attached to your completed questionnaire package. Consent forms and completed questionnaires will be securely stored separately in the Department of Psychology at Lakehead University for 5 years. Only members of the research team will have access to the completed questionnaires. This means that no one in your school (e.g., your teacher or principal) will have access to the completed questionnaires. The results of this project will be part of a doctoral dissertation and may be communicated in peer-reviewed venues such as scientific conferences and publications. Participants will remain anonymous in any publication or public presentation of research findings.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that you may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of you in the questionnaires; for example, mood, self-esteem, quality of important relationships. You may exercise your right to discuss any such reactions with a school counselor in the Student Services Department at _____ High School at (807) xxx-xxxx.

If you wish to take part in this project, please read and sign the attached consent form. If you are under the age of 18, you must also have your parent or legal guardian sign the "Parent/Guardian

Consent Form" and submit it to the researcher in order for you to participate in this project.

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or research@lakeheadu.ca.

Results for this project will be available by September 2014. If you would like further information about this project or a summary of the research results when available, feel free to contact me at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

Thank you,

Lezlie Gomes, M.A.
Doctoral Candidate
Department of Psychology, Lakehead University

Appendix U

Participant Consent Form (Study 2)

My signature below indicates that I have read the attached information letter and that I have had the opportunity to receive satisfactory answers from the researcher as to any questions that I might have about participation in this project.

Signing this form indicates that I understand and agree to the following:

I am a volunteer and can withdraw at any time from the project without penalty or consequence up until my completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, if I choose to withdraw after submission, the researchers could not locate the information specific to me.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that I may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of me in the questionnaires; for example, mood, self-esteem, quality of important relationships. I may exercise my right to discuss any such reactions with a school counselor in Student Services Department at _____ High School at (807) xxx-xxxx.

The information I provide by way of my responses to questionnaires will remain confidential, and will be securely stored in the Department of Psychology at Lakehead University for 5 years.

The information I provide will remain anonymous in any publication or public presentation of research results. I may receive a summary of the project in September 2014 by contacting the researcher at (807) xxx-xxxx or lcgomes@lakeheadu.ca.

If I am under the age of 18 at time of participation in the project, I am required to present to the researcher a separate form signed by my parent or legal guardian giving their permission for me to participate. That consent is in addition to the consent that I am giving on this form.

_____ _____

Name of Participant (please print) Date of Birth

_____ _____

Signature of Participant Date

Appendix V

Student Services Staff Information Letter (Study 2)

Dear Student Services Staff:

My name is Lezlie Gomes. I am a doctoral student in Clinical Psychology at Lakehead University under the supervision of Dr. Ron Davis. I am conducting a research study on the factors that influence the development of eating attitudes and behaviours in adolescent females. I would like to include Health and Physical Education students from _____ High School in my study. Your principal has been contacted and has given permission for your school's participation in the study.

I will be visiting classes to explain the purpose of the study, risks and benefits to participation, students' rights as participants and to answer any questions. Participant and parent/guardian information letters and consent forms will be given to those students interested in participating. I will return approximately one week later for interested students with signed consent forms to complete a number of questionnaires. The questionnaires will cover a variety of issues such as eating attitudes and behaviours, mood, self-esteem, perfectionism, and quality of relationships. To protect the integrity of the data, these questionnaires will be completed during class time and will take approximately 45 minutes.

Participation in this project is completely voluntary. Students who initially volunteer can subsequently withdraw anytime without penalty or consequence up until their completed questionnaires have been submitted. Due to the anonymous nature of the questionnaires, we would be unable to locate the information specific to a particular participant if someone chose to withdraw after submission.

Students may decline to answer any question that they are not comfortable answering. The information they provide by way of their responses on the questionnaires will be anonymous and remain confidential. Names will not be attached to the completed questionnaire packages. Consent forms and completed questionnaires will be securely stored separately in the Department of Psychology at Lakehead University for 5 years. Only members of the research team will have access to the completed questionnaires. No one in the school will have access to the completed questionnaires. The results of this project will be part of a doctoral dissertation and may be communicated in peer-reviewed venues such as scientific conferences and publications. Participants will remain anonymous in any publication or public presentation of research findings.

Participants may benefit from the learning experience that occurs when participating in psychological research. A risk associated with participation in this project is that students may experience an emotional reaction (positive, neutral, or negative) as a result of thinking about the personal issues that are being asked of them in the questionnaires; for example, mood, self-esteem, quality of important relationships. We will be providing students with the contact information for

the Student Services Department at _____ High School to discuss any such reactions with one of your counselors.
Students who wish to take part in the project will need to read and sign a consent form. Students under the age of 18 must also have a parent or legal guardian sign an additional consent form and submit it to me before they will be permitted to participate in the project.

This research study has been reviewed and approved by the _____ School Board and the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or research@lakeheadu.ca.

Results for this project will be available by September 2014. If you would like further information about this project or a summary of research results when available, feel free to contact me at (807) 707-8159 or lcgomes@lakeheadu.ca.

Thank you,

Lezlie Gomes, M.A.
Doctoral Candidate
Department of Psychology, Lakehead University