Self-Silencing and Anger Regulation as Predictors of Disordered Eating Among
Adolescent Females

A thesis submitted to
the Faculty of Graduate Studies and Research
in Partial Fulfillment of the requirements for the degree
Masters of Arts Degree in Psychology

by

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May 2009

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Your file Votre référence
ISBN: 978-0-494-51973-8
Our file Notre référence
ISBN: 978-0-494-51973-8

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Abstract

The purpose of the current study was to examine how factors of self-silencing, emotional regulation, and body-esteem were able to differentiate between different patterns of disordered eating. A community sample of adolescent females was classified as either: 1) Restrained ($n = 104$, M age = 14.48); 2) Emotional ($n = 125$, M age = 14.52); or, 3) Healthy Eaters ($n = 396$, M age = 13.71). A discriminant function analysis revealed two significant functions, the first which differentiated the healthy group from the disordered eating groups, demonstrating that the disordered eating groups scored significantly higher on levels of self-silencing and anger regulation, and lower on body-esteem, compared to the healthy eaters. The second function differentiated between the restrained and emotional eaters, revealing that emotional eaters reported higher levels of externalized self and anger, and lower levels of body-esteem. The results are discussed in terms of the implications for prevention programs.

Acknowledgements

I would like to thank my supervisor, Dr. Anne Bowker, for her continuous guidance and support. I have learnt a great deal under her supervision, and I look forward to applying this knowledge throughout my upcoming years as a PhD student. I would also like to thank my committee members, Drs. Annick Buchholz, Stefania Maggi, and Karen March for providing me with guidance in this process. An extra special thank you to Dr. Annick Buchholz, who has acted as both a supervisor and mentor to me over the past three years. Furthermore, I would like to thank the entire REAL team, as their dedication and interest in research made this entire study possible. Finally, I would like to thank my family and friends, who have been there for me throughout this journey, and whom I could not have done this without.

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Self-Silencing and Anger Regulation as Predictors of Disordered Eating among Adolescent Females

Eating disorders are very serious and mentally debilitating psychiatric illnesses (American Psychiatric Association, 1994; Gucciardi, Celasun, Ahmad, & Stewart, 2004). Individuals suffering from eating disorders have a lower quality of life, and subsequently experience social difficulties (Mond, Hay, Rodgers, Owen, & Beumont, 2005). There are serious health implications associated with eating disorders, and cases of infertility (Key, Mason, & Bolton, 2000), osteoporosis (Zipfel, Herzog, Beumont, & Russell, 2000), and cardiovascular problems (Winston & Stafford, 2000) have been documented in the literature.

Given the severity and complexity of eating disorders, researchers have focused on identifying the potential precursors which may impact the risk that one will develop an eating disorder (e.g., Beato-Fernandez, Rodriguez-Cano, Belmonte-Llario, & Martinez-Delgado, 2004; Button, Sonuga-Barke, Davies, & Thompson, 1996; Fairburn, Welch, Doll, Davies, & O'Connor, 1997; Heinberg, Thompson, & Stormer, 1995; Neumark-Sztainer et al., 2002; 2007; Polivy & Herman, 2002; Stice & Agras, 1998). The above experts in the field of eating disorders have agreed that common risk factors include (among others): being female, having low body esteem, and perceived pressure to be thin. Typically these pressures come from sociocultural influences, which include one's family members, peers, and/or the media (e.g., Field et al., 2008). A combination of these factors are believed to increase the likelihood that an adolescent will start dieting, and dieting can lead to more severe disordered eating behaviours, thus increasing the risk that he/she will develop a clinical eating disorder (McVey, Tweed, & Blackmore, 2004).

In addition to these well-known factors which place females at a greater risk of disordered eating, it has also been theorized that these behaviours may be the result of a failure to develop a strong, positive sense of self (Farchaus Stein & Nyquist, 2001). A poor sense of self has been a focus among feminine theorists for many years (e.g., Gilligan, 1988; 1993; Pipher, 1994), and it has been suggested that in the desire to become the 'perfect' woman, females strive to maintain a calm, composed demeanor, and as a result they often suppress their true thoughts and emotions (Gilligan, 1993; Jack & Dill, 1992). It is believed that this 'perfect' self, which involves placing others needs before one's own, is synonymous with the 'false' self. Furthermore, it is believed that presenting a 'perfect' (though false) self and suppressing negative emotions, such as anger, may lead to disordered eating as women learn to direct their anger inwards and consequently displace their negative thoughts and feelings onto their body.

The 'false self' is typically associated with low self-esteem, which is positively related to poor body-esteem, a strong risk factor for the development of eating disorders (Attie & Brooks-Gunn, 1989; Leon, Fulkerson, Perry, & Cudeck, 1993). Thus, in keeping with past research and theories, the present study will examine factors of interpersonal orientation (i.e., whether one silences her true thoughts and feelings, and presents a false self), emotional regulation (i.e., how one expresses or suppresses one's feelings of anger), and body esteem as they are able to predict membership within three distinct groups of adolescent females.

More specifically this study will focus on two main types of disordered eating behaviours: a) restraint, and b) emotional eating. As restraint and emotional eating are characteristic of clinical eating disorders (Wardle 1987), it is hypothesized that when a

female engages in either, or both of these behaviours she will be at a greater risk of developing an eating disorder, the details of which will be explained below.

Rates of eating disorders peak in late adolescence with females being approximately ten times more likely to be affected than males (American Psychiatric Association, 1994; van Hoeken, Seidell, & Hoek, 2003), making them the third most common form of chronic illness among adolescent females (Whitaker, 1992). Given that females are at a greater risk of developing an eating disorder, the current study will focus solely on females. The following section will provide a more in-depth discussion of the etiology of eating disorders, the theories associated with the development of eating disorders, and past research, which has examined the predictor variables of interest: Interpersonal orientation (i.e., self-silencing) and emotional regulation (i.e., anger expression or suppression).

Eating Disorders

Jones and colleagues (2001) completed a study that investigated the eating behaviours of adolescent females in Ontario. They reported that 23% of participants were currently dieting to lose weight, and 27% of the participants were suffering from unhealthy eating attitudes and behaviours. These behaviours put youth at a greater risk of developing Anorexia Nervosa or Bulimia Nervosa, the two types of eating disorders which are of interest in the current study. The Diagnostic and Statistical Manual (DSM-IV; American Psychiatric Association, 1994) outlines the features of both Anorexia Nervosa and Bulimia Nervosa. Anorexia Nervosa (AN) is characterized by extreme body dissatisfaction and an intense fear of being fat. Those suffering from AN agonize about gaining weight, even though they are underweight, and believe themselves to be larger

than they really are. They refuse to maintain a normal weight, which is at or above the minimum normal weight for their specific age and height (i.e., having a body weight under the 85th percentile). The prevalence rate of AN among adolescent females is approximately 0.3%, however due to the strong denial that is characteristic of AN it is believed that a lot of cases go unreported and therefore are not documented in the literature (Hoek & van Hoeken, 2003). The majority of people who suffer from AN refuse to acknowledge that what they are doing to their body is dangerous and potentially fatal, as an estimated 15% of adolescents with AN die if they are not treated (Wang & Brownell, 2005).

The DSM-IV differentiates between two subtypes of AN, the restricting subtype, which is when a person does not engage in binge/purge behaviours, and AN-Binge/Purge, which is when a person engages in bingeing and purging behaviours although they are still unable to maintain a normal body weight. As there are clearer distinctions between the symptomatology of AN-Restrict and Bulimia Nervosa, for the purposes of the current study the focus will be on the AN-Restrict subtype.

The second eating disorder of interest in the current study is Bulimia Nervosa (BN), which has a higher prevalence rate than other eating disorders, with approximately 1% of young women being affected (Hoek & van Hoeken, 2003). Bulimia Nervosa is characterized by recurring episodes of binge eating (American Psychiatric Association, 1994). A binge episode is defined as eating in a discrete period of time an amount of food that is larger than most people would eat in a similar time frame, and feeling a loss of control during the binge. For a diagnosis of BN to be made, the binge and purge episodes both occur at least twice a week for a minimum of three months and do not occur

exclusively during periods of AN (i.e., AN-BP). Bingeing is followed by compensatory behaviours to prevent weight gain. Compensatory behaviours may include self-induced purging, excessive exercise, or the use of enemas, laxatives, diet pills, and/or diuretics. There are two subtypes of BN that are differentiated based on the types of compensatory behaviours employed. For the purpose of the current study the focus will be on BN-Purge subtype, which is when one regularly self-induces vomiting, abuses laxatives, diuretics or enemas, as opposed to the non-purge subtype, which is characterized by the use of non-purge compensatory behaviours (i.e., fasting or excessive exercise). The cognitive characteristics of BN are quite similar to those of AN, and include extreme body dissatisfaction and low self-esteem (American Psychiatric Association, 1994).

People with either AN or BN suffer from very low body esteem, and previous research has found that poor body esteem is a primary risk factor for the development of an eating disorder (Attie & Brooks-Gunn, 1989; Leon et al., 1993). Therefore, in the current study, it is believed that disordered eating behaviours (i.e., restrained and emotional eating) will be predicted by self-silencing, poor emotional regulation and low body esteem. It is expected that those who conform to the expectations of the 'ideal woman' will have lower body esteem, and be more likely to try to improve their feelings about their body by losing weight.

In an effort to control their weight, women typically restrict their daily calorie intake. However, when one experiences a stressful event and subsequently experiences emotional disinhibitors (e.g., feelings of anger), it is not uncommon for a woman to abandon her diet and engage in emotional eating as a way of coping with her negative emotions.

Restraint Eating Theory

The construct of restraint was originally proposed by Herman and Mack (1975), and was defined as a constant attempt to inhibit one's dietary intake in order to reduce body weight. This concept was later developed into the *Restraint Theory* which argued that chronic dieters are constantly depriving themselves of food trying to balance their internal hunger cues with their strong desire to lose weight. Although the Restraint Theory does not refer to the impact of body esteem, it can be inferred that people originally begin to diet as they are dissatisfied with their bodies (Attie & Brooks-Gunn, 1989).

Herman and Polivy (1980) suggested that when individuals severely restrict food intake they suffer from persistent hunger pains and are more apt to break down and binge. Thus, they argued that restrained eaters are more likely (than non-restrained eaters) to engage in binges and therefore gain weight, a phenomenon that has been identified as counter-regulation (Herman & Polivy, 1980; Polivy & Herman, 1985).

However, not all individuals who restrict their eating are prone to bingeing. For example, females suffering from AN-Restrict constantly restricting their food intake and do not normally engage in bingeing. The Disinhibitor hypothesis helps to explain why certain individuals are likely to binge whereas others are not (Polivy & Herman, 1985). This hypothesis proposes that when restrained eaters experience events known as disinhibitors (i.e., emotional, cognitive, or physiological changes), their dietary self-control will be interrupted and they will indulge in food. The disinhibition hypothesis is in support of the theory that dieting leads to bingeing, which in turn may lead to the development of Bulimia Nervosa or obesity (Polivy & Herman, 1985).

Measuring Restraint & Disinhibition

The Dutch Eating Behaviour Questionnaire (DEBQ; van Strein, Frijters, Bergers, & Defares, 1986) is composed of three subscales: 1) the Restraint subscale, which assesses the level that a person restricts their eating; 2) the Emotional Eating subscale; and, 3) the External Eating subscale. While early research on the Restraint Eating Theory focused on a one-dimensional model of restraint (i.e., restraint leading to overeating), more recent research favours a two-dimensional model of Restraint, assessing one's level of restraint eating and levels of disinhibition separately. This more recent research acknowledges that there may be more or less successful restrained eaters, depending on the likelihood that they will eat when disinhibited. Therefore, research suggests that there may be two types of restrained eaters, those who are at a greater risk of developing AN (i.e., 'successful' dieters) who score high on restraint, and low on emotional eating, and those who are more likely to develop BN (i.e., 'unsuccessful' dieters) who endorse high levels of emotional eating and lower levels of restraint (Ouwens, van Strien, & van der Staak, 2003; van Strien, 1997).

In an attempt to validate the DEBQ, Wardle (1987) examined four groups of participants, those who were overweight (OW), those with BN, those with AN, and Controls. They found that all three of the experimental groups scored higher on the Restraint subscale than the Controls. Those who were suffering from BN had the highest scores on the Emotional Eating subscale, and those with AN scored significantly lower than the controls on the Emotional Eating subscale. However, scores on the restrained eating subscale were equally high for all three groups (OW, AN, BN).

The results of this study support the idea that people with AN and BN both endorse items of restrained eating, but differ with respect to their levels of disinhibition. In the present study an attempt will be made to differentiate between those ‘successful’ dieters, who score high on levels of restraint and lower on levels of emotional eating, and those less ‘successful’ dieters, who are caught in the chronic dieting cycle and report high levels of emotional eating.

‘Successful’ dieters typically have perfectionist traits and are motivated by an extreme desire to be thin; two characteristics typically observed in those suffering from AN (American Psychiatric Association, 1994), which would make them less likely to eat when faced with disinhibitors. However, for those who are less ‘successful’ at dieting it is believed that their failure to maintain weight loss could be due to the fact that they are more likely to engage in episodes of emotional eating when faced with negative moods or interpersonal stressors (Heatherton & Baumeister, 1991).

Anger as a Disinhibitor

Physiologically, when a person is in an aroused state (e.g., highly anxious or angry) he/she experiences a decrease in appetite, and yet the opposite has been found to be true for emotional eaters (Schacter, Goldman, & Gordon, 1968). It has been argued that some people are more prone to eat as a way of coping with emotional stressors, which is thought to have developed from early learning experiences (Bruch, 1973; Kaplan & Kaplan, 1957). Kaplan and Kaplan (1957) proposed the psychosomatic theory, which attempted to explain why obese people engage in emotional eating. They argued that chronic dieters and obese people are more likely to emotionally eat as it provides

comfort to them during times of increased stress. However, this theory has not been supported in the literature (Polivy, Herman, & McFarlane, 1994; van Strien et al., 1986).

In a thorough review of stress and eating, Greeno and Wing (1994) concluded that emotions do have an impact on the amount of food that one eats. Furthermore, they found that the most empirically supported theory of eating under stress was the Restraint theory. Studies based on the Restraint theory have demonstrated that dieters (i.e., restrictors) are more likely to engage in emotional eating than non-dieters (Polivy & Herman, 1985; Ruderman, 1986) as the majority of dieters have not been found to have long-term success in losing weight through dieting (Heatherton, Polivy, & Herman, 1991).

Coping with emotional stress often involves controlling one's emotions, such as anger. Anger is a negative emotion which research has shown to be associated with eating disorders (Geller, Cockell, Goldner, & Flett, 2000; Zaitsoff, Geller, & Srikaneswaran, 2002). The way in which a female learns to express or suppress her anger is related to the concept of presenting the 'ideal self'. From a young age, females are taught to present the perfect self and not create or cause controversy with others (Brown, Tappan, Gilligan, Miller, & Argyris, 1989; Brown, 1998; Pipher, 1994). Outwardly expressing one's anger is not thought to fit within the feminine ideal; therefore girls are taught that it is more appropriate to suppress their true emotions. van Daalen-Smith (2008) argued that there is no seemingly right way for females to deal with their anger as there are social consequences imposed upon them when they express it, and mental and physical health consequences when they suppress it. Mental health issues that have been associated with loss of voice and anger suppression include poor self-esteem

(van Daalen-Smith, 2008), depression (Munhall, 1994), and eating disorders (Buchholz al., 2007; Geller et al., 2000; Zaitsoff et al., 2002).

While the direction of the relationship between anger suppression or expression and restricting or emotionally eating is unclear, the present study will include anger as a disinhibiting factor that may explain why some females engage in emotional eating. It is believed that the 'successful' and 'unsuccessful' dieters will be representative of those who are at a greater likelihood of developing AN-Restrict or BN-Binge/Purge, respectively. Furthermore, consistent with past research, it is expected that these two groups will both be likely to restrict their eating, indicated by endorsing items on the DEBQ-Restraint; however those who are at a greater risk of developing BN will report higher levels of emotional eating (Wardle, 1987). In an attempt to identify the factors which may distinguish between these groups, those who score high on restraint, and low on emotional eating will be named the restrained eaters, whereas those who score high on emotional eating and lower on restraint will be named the emotional eaters.

Research investigating the role of anger in eating disorders has primarily focused on the association between binge eating and anger expression and suppression among adult females. In a study of nonclinical women, investigators examined how bulimic attitudes and behaviours were related to anger. They found that binge eating demonstrated a significant positive relation with anger suppression, and was negatively correlated with the outward expression of anger (Milligan & Waller, 2000). Penas-Lledo and colleagues (2004) conducted their study that investigated the relationship between specific bulimic behaviours (i.e., bingeing, fasting, and purging) within a Spanish speaking sample of undergraduate participants. In contrast to Milligan and Waller (2000),

they reported that outwardly expressing one's anger was positively related to bingeing; however there was no association between bulimic behaviours and anger suppression. The discrepancies in these results may be attributed to cultural differences that exist among the respective populations of each study. It is possible that the Spanish culture is less likely to socialize females in a way that makes them feel as though they should suppress their true emotions, whereas research has documented that this does occur among English speaking populations. Support for this idea is seen in the results of a study performed by Fox and Harrison (2008), as they conducted a study which compared two groups of females from a British University, those with eating pathology and those without. Their findings demonstrated that levels of anger expression were not significantly higher in females with disturbed eating pathology, but levels of anger suppression were significantly greater in the females with eating pathology in comparison to the control group.

While these studies support the idea that anger regulation plays a role in disordered eating, the inconsistent findings elucidate the need for researchers to further investigate the relations between these constructs. It is necessary to obtain a more extensive understanding of the role of anger in the development of unhealthy eating behaviours.

Fassino, Daga, Pierô, Leombruni, and Rovera (2001) investigated the difference in levels of anger expression among those with AN-R, AN-BP, BN, and a control group. They found that participants with BN reported greater levels of anger suppression (i.e., anger-in) and anger expression (i.e., anger-out) when compared with the other groups. In contrast, there were no significant differences among those with AN-R or AN-BP on

levels of anger suppression or expression when compared to the control group. The results of these findings provide additional support for a positive relation between bulimic attitudes and behaviours and anger suppression.

Waller et al (2003) examined patients who had been diagnosed with an eating disorder (i.e., AN-R, AN-BP, BN, or Binge Eating Disorder) and compared them with a healthy control group on levels of anger and bulimic behaviours. The study found similar results to Fassino's study, in that participants who engaged in bulimic behaviours (i.e., participants diagnosed with BN, AN-BP, or Binge Eating Disorder) reported greater levels of anger suppression than those with AN-R and the control group. Furthermore, the results of this study indicated that there were no differences among groups on levels of anger expression (i.e., anger-out).

The results of these studies indicate that females who engage in bulimic behaviours are more likely to report higher levels of suppressed anger. Overall, these findings suggest that females who engage in bulimic behaviours consistently report greater levels of anger suppression, and although it occurs less frequently, they have also been found to report higher levels of anger expression than those without eating problems. These findings support the idea of anger and disordered eating as multifaceted constructs, and therefore, one of the goals of the current study will be to expand on existing research by examining how anger suppression and expression relate to restrained and emotional eating, thereby increasing our understanding of the role of anger in disordered eating.

Self-Silencing as a disinhibitor

Carol Gilligan (1993) was the first to report on the concept of ‘loss of voice’ that girls experienced during adolescence. Gilligan observed that females would silence their true selves in an effort to maintain their interpersonal relationships. In doing so, Gilligan noted that girls begin putting the needs of others before their own, losing their ability to recognize their own true wants and needs. Gilligan (1988) believed that the loss of voice that females experience increased their risk of developing psychological disorders such as depression. From Gilligan’s work, Jack (1991) created the Silencing the Self theory, which maintains that females learn to suppress their true feelings and emotions as they do not fit within the traditional female role, and as a result they learn to silence their selves. From the Self-Silencing theory, Jack and Dill (1992) created the Silencing the Self Scale (STSS) which measures four constructs, including the degree that a person judges him/herself based on the opinions of others (Externalized Self-Perception); the extent which one puts the needs of others before his/her own in an effort to secure his/her relationships (Care as Self-Sacrifice); the degree to which one silences his/her own true desires as a way of maintaining harmony with others (Silencing the Self); and finally, the effect of constantly portraying an outwardly compliant (fraudulent) self while one’s concealed inner self grows angry and hostile (Divided Self).

Studies which have investigated how the constructs of self-silencing relate to disordered eating have mainly focused on undergraduate females, finding higher scores on the STSS to be related to more disturbed eating pathology (Frank & Thomas, 2003; Smolak & Munstertieger, 2002). Studies have also examined these relationships among adolescents using a revised adolescent version of the STSS (Sippola & Bukowski, 1996).

In a community sample of adolescent females, the correlations between interpersonal relationships, eating behaviours and body esteem were investigated (Lieberman, Gauvin, Bukowski, & White, 2001). In this study the researchers hypothesized that high externalized self-perceptions, which indicate that one judges himself/herself based on the opinions of others, would be negatively correlated with body satisfaction. The results were consistent with the hypothesis as they found that a high level of externalized self-perception was predictive of lower body esteem. Similar results were reported in a clinical sample of adolescent females with eating disorders (Buchholz et al., 2007). This study investigated how self-silencing behaviours were related to eating disorder symptomatology, finding that self-silencing behaviours were positively correlated with eating disordered cognitions and behaviours. More specifically, they found that Externalized Self-Perception was a unique predictor of eating disordered cognitions, mainly body dissatisfaction and drive for thinness.

Self-Silencing and Anger

Studies have also examined both self-silencing and anger in relation to eating pathology. Geller and her colleagues (2000) sought to investigate how women with AN silence their true selves, and how this may be related to poor body esteem. By examining a sample of women with AN, a psychiatric control group, and a healthy control group, they found that the women with AN reported significantly higher scores on all subscales of the STSS, and that these factors were related to low body esteem. Furthermore, they found that even after controlling for self-esteem, depressed mood, and global assessment of functioning, Care as Self Sacrifice and Self-Silencing were still significantly elevated in the AN group, as opposed to the other two groups (Geller et al., 2000). These results

are similar to the non clinical studies which have examined self-silencing and eating disordered behaviours.

In addition, this study also examined the role of anger suppression in disordered eating, finding that that woman with AN reported higher levels of anger suppression in comparison to psychiatric and healthy control groups (Geller et al., 2000). These findings are in contrast to previous studies, which found that it is typically bulimic behaviours that report significant differences in anger suppression. A limitation of this study is that it fails to specify which subtype of AN the participants were diagnosed with, and therefore Waller et al (2003) suggested that higher levels of anger suppression may be attributed to a high number of participants with AN-BP.

In a community sample of adolescent females, self-silencing and anger suppression were examined in conjunction with disordered eating behaviours (Zaitsoff et al., 2002). This study reported results which were consistent with past research in that greater levels of self-silencing were related to disordered eating behaviours. When comparing those with eating pathology to those without, the results indicated that there were no differences in the way in which the two groups outwardly expressed their anger. However, when they examined eating disorder cognitions and behaviours separately, anger suppression (i.e., anger-in) accounted for a significant amount of variance in those with disturbed eating disorder cognitions after controlling for shape and weight based esteem (Zaitsoff et al., 2002).

Findings from these studies elucidate the role of anger and self-silencing in the development of disordered eating behaviours. While greater levels of self-silencing have been consistently found to relate to general eating pathology, research has yet to

document how self-silencing is related to specific disordered eating behaviours among adolescents. Additionally, previous research has not reported consistent findings regarding the ways that anger is expressed or suppressed in relation to disordered eating. Therefore, more research is needed to further understand the role of anger expression and suppression in relation to disordered eating.

The Present Study

The purpose of the current study was to explore how females' emotional and interpersonal styles are associated with their reported levels of restrained and/or emotional eating. One of the main goals of the current study was to test proximal factors, including self-silencing, anger expression, and low body esteem, which were expected to increase the risk that a female will engage in disordered eating behaviours.

This study examined the extent to which the identified risk factors were able to predict group membership in three distinct sets of adolescent females. The three groups were categorized based on their self-reported levels of restraint and emotional eating. More specifically, the three groups of interest were: 1) females who scored high on restraint and low on emotional eating, that is *Restrained Eaters*; 2) those females who scored high on measures of emotional eating and lower on levels of restraint, that is *Emotional Eaters*; and, 3) females who scored low on both restraint and emotional eating, the *Healthy Eaters* (i.e., the controls). As previously described, past research has suggested that these three groups are characteristic of those who are at a greater risk of developing AN-R, BN-P, and a healthy control group, respectively (Ouwens et al., 2003; van Strien, 1997).

The current study expands on previous research by examining the correlates that are associated with both restrained and emotional eaters, as compared to a healthy control group. This is the first study of its kind to test the relations between the proposed constructs among three groups of adolescents who report distinctly different eating styles. In doing so, we are able to examine the differences and/or similarities in the ways in which self-silencing and anger expression and suppression are associated with these groups.

To do so this study examined: 1) how interpersonal orientation (self-silencing, as measured by silencing the self, externalized self-perception, and care as self-sacrifice) predicts emotional eating and/or restrained eating; 2) how anger regulation (both anger-in and out) predicts emotional eating and/or restrained eating; and finally; 3) how body esteem predicts emotional eating and/or restrained eating. In order to meet these objectives, the following hypotheses were tested within a community sample of adolescent females:

- 1) It was hypothesized that the constructs of self-silencing (i.e., externalized self-perception, care as self-sacrifice, and self-silencing) would positively predict disordered eating (i.e., restraint and emotional eating). Consistent with past research it was expected that the relation between these constructs would be strongest between externalized self-perception and disordered eating, that is, either restrained or emotional eating (Lieberman et al., 2001; Buchholz et al., 2007).
- 2) It was expected that there would be a positive relation between anger suppression, low body esteem, and disordered eating. Furthermore, it was expected that anger-

in would be a stronger predictor of the *Restrained Eating* group, as compared to the *Emotional Eating* group. Previous research has produced mixed findings among the relation between anger suppression, restraint, and emotional eating, as levels of anger suppression seem to be elevated in those with both anorexic and bulimic eating pathology. However, Wardle (1987) found that those with AN and BN both reported higher levels of restraint than the controls, therefore, it is hypothesized that it is the aspect of restricting one's dietary intake that may be related to the suppression of anger, and it was hypothesized that the relation between these constructs would be stronger than the relation between anger suppression and emotional eating.

- 3) It was hypothesized that the outward expression of anger would be a positive predictor of emotional eating, but would show a non-significant relationship with restraint. Past research has demonstrated that people who engage in bingeing, which is associated with emotional eating, have reported greater levels of anger expression (Fassino et al., 2001). However, there have been other studies which have reported dissimilar findings, in that binge episodes were not related to the outward expression of anger (Milligan & Waller, 2000).
- 4) Interpersonal and emotional styles develop over time and have been observed to become more prominent personality characteristics as girls approach adolescence (Gilligan, 1993). Correspondingly, research has shown that as adolescent girls transition into adolescence, they are more likely to start feeling dissatisfied with their bodies, a phenomenon that is so common it has been coined "normative discontent" (Rodin, Silberstein & Striegel-Moore, 1984). Previous studies have

identified body dissatisfaction as one of the primary reasons that girls develop problematic eating behaviours (Attie & Brooks-Gunn, 1989; Leon et al., 1993). Therefore appearance esteem, which measures how one feels about her/his appearance, was used as a measure of body-esteem and was included in the analyses as a predictor of eating behaviour group membership. It was hypothesized that positive body-esteem would be higher among those in the healthy eating group. Additionally, it was expected that body-esteem would be able to differentiate between the restrained and emotional eaters. It was believed that females who pose restrictions on their dietary intake are more likely to feel dissatisfied with their body, compared to those females who engage in emotional eating. Therefore, it was hypothesized that body-esteem would be lower among the restrained eating group.

Method

This research is part of a larger longitudinal research study, the Research on Eating and Adolescent Lifestyle (REAL) study. The overall goal of the study is to identify and examine the shared predictors and protective factors associated with eating disorders and obesity in youth.

The REAL study is partnered with the following associations/organizations: Ottawa-Carleton District School Board; Ottawa-Carleton Catholic District School Board; Upper Canada District School Board; Several Private Schools; Hopewell Eating Disorders Support Center; and the Ontario Community Outreach Program for Eating Disorders. Funding for the REAL study has come from the University of Ottawa Medical Research Fund (UMRF) (awarded 2005 – 2006) and a grant from the Provincial Centre of

Excellence for Child and Youth Mental Health (awarded 2006 – 2008). The research team is made up of respected health professionals from the Ottawa area, including: Martine Flament, M.D., Ph.D., who is the Principal investigator. Dr. Flament is a child and adolescent psychiatrist; she is the Research Director of the Youth Unit at the University of Ottawa Institute of Mental Health Research. Annick Buchholz, Ph.D., is a co-investigator. Dr. Buchholz is a child and adolescent psychologist, with expertise in body image and eating disorders; she is the Lead, Outcomes Management and Research of the Regional Eating Disorder Program at the Children's Hospital of Eastern Ontario (CHEO). Katherine Henderson, Ph.D., is also a co-investigator. Dr. Henderson is a child and adolescent psychologist, with expertise in body image and eating disorders; she is the Clinical Director of the Regional Eating Disorder Program at CHEO. Finally, Gary Goldfield, PhD., is a co-investigator. Dr. Goldfield is a child and adolescent psychologist at CHEO, and is an expert in the field of obesity. In addition, there are full-time research assistants, graduate students, and student volunteers who all assist in the REAL study.

As a graduate research assistant on this project, I have gained invaluable experience in all areas of a large community based study. I have had the opportunity to introduce the research to students at schools in the greater Ottawa area, and I have administered the measures to the participants and measured individual's weight and height. I have also been involved in data management, scoring, and analysis.

Participants

A community sample of 1317 adolescent females from junior and senior high schools in the greater Ottawa area completed a battery of questionnaires to examine various factors related to interpersonal functioning, emotional regulation, and eating

behaviours. The study was conducted during the academic years from 2004 to 2007, and participants were recruited through their schools that had been solicited for participation via the Ottawa-Carleton Separate and District school boards, and private Ottawa-area schools. Classes were randomly selected from the schools that agreed to participate to avoid clustering effects. Grade seven and nine classes were targeted, as these students were eligible to participate in the longitudinal component of the study. Schools were selected from rural, suburban, and urban areas ($n = 199$ rural area, $n = 224$ suburban area, $n = 894$ urban area), as well as from the public and private streams ($n = 139$ private schools, $n = 1178$ public schools). Attempts were made to establish equal distribution across age ($M = 14.24$, $SD = 1.56$) and grade level. Three hundred and seventy-seven participants were in grade seven (28.8%), 259 in grade eight (19.7%), 439 in grade nine (33.3%), 124 in grade ten (9.4%), 47 in grade eleven (3.6%) and 71 in grade twelve (5.4%). Seventy eight percent of the sample spoke English as their first language ($n = 1030$), while 7.6% spoke French ($n = 100$) and 14.4% spoke a different language ($n = 187$).

Procedure and Design

Students were informed about the current research study in the classroom or as a group in the cafeteria. Students who wished to participate in the study were given letters of consent for a parent or guardian to sign, as well as assent forms that they were required to sign (please see Appendix A). Approximately one week later, research assistants returned to the school to administer the package of questionnaires to the students who had the appropriate consent and assent forms. Questionnaires were filled out in the classroom; those students who opted not to participate remained in the class and were given school

work to do. After the participants filled out their questionnaires, they were taken to a private area where they were weighed and measured by a research assistant to determine their Body Mass Index (BMI). Questionnaires were scored within 48 hours of being administered. If any participant reported suicidal ideations, high depression scores or eating disordered behaviors, a member of the research team- either a psychologist or psychiatrist, provided individual follow-up to those students.

Measures

Out of the larger study, the four measures that were utilized in the current study were taken from part of a larger study which assesses participants on factors relating to the youth's lifestyles, families, emotions, and eating behaviours (please see Appendix B). These measures were chosen to identify how factors pertaining to interpersonal orientation, emotional regulation, and body esteem were able to predict disordered eating, that is either emotional eating or restricting.

Dutch Eating Behaviour Questionnaire (DEBQ; van Strein, Frijters, Bergers, & Defares, 1986). This 33-item measure is composed of three subscales measuring distinct types of disordered eating behaviours. *Restrained Eating*, which measures the extent to which one restricts their food intake is composed of 10 items with mean total scores ranging from a possible 1-5. *Emotional Eating*, which measures the likelihood that a person will eat in order to seek comfort or to cope with an emotionally charged situation is composed of 13 items with mean total scores ranging from a possible 1 – 5. *External Eating*, which measures the frequency which one eats when enticed by present food cues (e.g., appearance and/or odour) is composed of 10 items with mean total scores ranging from a possible 1-5. The DEBQ has been validated for use in adults (Wardle, 1987) and

children (Halvarsson & Sjoden, 1998); and has been shown to be a reliable measure in both populations. For the purpose of the current study, only the Restrained Eating and Emotional eating subscales were utilized. The restraint eating subscale has been demonstrated as a reliable measure for use in adolescent females (Banasiak, Wertheim, Koerner, & Voudouris, 2001). This study found that the restraint subscale of the DEBQ had a strong Cronbach alpha ($\alpha = .94$) and showed good test-retest reliability over a four to five week period (Banasiak et al., 2001). In the current study, both the restraint and the emotional eating subscales of the DEBQ had strong Cronbach's alphas ($\alpha = .93$ and $.94$, respectively).

Body Esteem Scale for Adolescents and Adults (BESAA; Mendelson, Mendelson, & White, 2001; Cecil, Stanley, & Melinda, 1997). The BESAA is a 23 item scale that is a rated on a 5 point Likert scale, from 0 (never) to 4 (always). The BESAA is composed of three subscales which each measure unique aspects of body esteem: *Appearance esteem*, which measures how one feels about their appearance (i.e. item 11 "I wished I looked like someone else."), *Weight esteem*, how satisfied one is with their weight (i.e. item 8 "I am satisfied with my weight."), and *Attribution*, which examines other's evaluations about one's own physical appearance, (i.e. item 2 "Other people consider me good looking."). The BESAA has been demonstrated to be both a valid and reliable measure. This measure has demonstrated convergent validity (with measures of self-esteem), test-retest reliability, and high Cronbach alpha's for each subscale: BE-Appearance = $.92$, BE-Weight = $.94$. BE-Attribution = $.81$ (Mendelson et al., 2001). For the purposes of the current study, only the Appearance Esteem subscale was utilized as a measure of body-esteem. This subscale demonstrated adequate reliability in the current study ($\alpha = .75$).

Silencing the Self Scale for Adolescents (STSS-A; Buchholz, Norwood, Henderson, Goldfield, & Flament, 2008; Jack & Dill, 1992; Sippola & Bukowski, 1996)

The STSS-A was used in this study to determine friendship intimacy and self-silencing behaviours. The STSS-A was originally adapted for use in adolescents by Sippola and Bukowski (1996) to capture the dynamics of friendships as opposed to romantic relationships, which the original 31-item STSS (Jack & Dill, 1992) assessed. The original STSS was based on a model of depression which suggests that women engage in cognitive schemas to establish and maintain their interpersonal relationships, and as a result they silence their true selves (Jack & Dill, 1992). The STSS-A has been validated in an adolescent sample (Buchholz et al., 2008). A principal components analysis of the revised STSS revealed a three factor structure that was identical for both males and females and suitable for use in adolescents. The STSS-A has 15 items rated on a 5-point Likert scale, with scores ranging from a possible 15 to 75. The STSS-A is composed of 3 subscales, *Externalized Self-Perception*, which is the extent to which one judges oneself based on the opinions of others (e.g. Item 4 “I tend to judge myself by how I think my friends see me”), *Silencing the Self*, not expressing one’s true thoughts to avoid confrontation with others (e.g. Item 19 “I think it’s better to keep my feelings to myself when they conflict with my friends”), and *Care as Self-Sacrifice*, giving up one’s own true wishes and desires by putting others before her/himself (e.g. Item 2 “Caring means putting the other person’s needs in front of my own”). While the original STSS was composed of four subscales, the items from the original STSS fourth subscale, the Divided Self, were extracted as part of the same component as items of the STSS Externalized Self subscale. These two subscales are based on similar constructs. Jack and

Dill (1992) originally identified the Divided Self as the experience of presenting an outward self who yields to the wishes of others, while the inner self lies in turmoil and the Externalized Self-Perception subscale measured how one judges oneself based on the opinions of others. For the purposes of the current study, externalized self-perception ($\alpha = .84$), silencing the self ($\alpha = .71$), and care as self-sacrifice ($\alpha = .64$), were utilized as individual predictors.

State-Trait Anger Expression Inventory (S-TAXI ; Forgays, Forgays, & Spielberger, 1997; Fuqua, Leonard, Masters, & Smith, 1991; Spielberger et al., 1985). This measure includes three subscales, State Anger, Trait Anger and Anger Expression, but for the purpose of this study only the Anger-In and Anger-Out subsections of the Anger-Expression subscale were utilized. These subsections are composed of 8 items that rate anger expression on a 4-point Likert scale from (1) “almost never” to (4) “almost always.” The possible ranges of total scores for both subsections are 8 to 32. The S-TAXI has been used with children and adolescents aged 7 - 17 (del Barrio, Aluja, & Spielberger, 2004). Both the Anger-In and Out subsections demonstrated adequate reliability in the present study, with alphas of .79 and .78, respectively.

Ethical Considerations

The study was approved by the Research Ethics Boards of the Royal Ottawa Hospital and the Children's Hospital of Eastern Ontario, Carleton University, as well as the appropriate research councils at each of the school boards. Private schools gave individual consent to the study. Each participant had to return both consent and assent forms signed by themselves and at least one parent in order to participate in the study. Questionnaires are confidential and are numerically ordered, with a master list matching

names and questionnaire numbers existing in a separate location from the locked consent forms.

Results

The overall purpose of the current study was to examine how factors of self-silencing, anger expression and suppression, and body-esteem were able to differentiate between groups of adolescent females who differed on levels of restrained and emotional eating. The Statistical Package for the Social Sciences (SPSS 16) was utilized to perform the statistical analyses. The data set was cleaned and verified and an outlier analysis was performed after cleaning the data. The data was cleaned by examining maximum and minimum scores to determine if each item was scored accurately within the correct scoring range for each item, and then for each subscale score and total score of individual scales to ensure inaccurate or careless responding did not skew data. After ensuring that all data was entered within an appropriate range for each of the respective measures, a missing value analysis (MVA) was performed, revealing less than 5% of missing cases in the dataset. Tests of univariate normality were utilized to assess multivariate normality; Tabachnick and Fidell (2007) recommended that when examining normality within large samples, importance should be placed on a visual examination of the histograms, which were deemed to be satisfactory in the current study. Box's M was computed in order to ensure that the homogeneity of covariance assumption had been met. Finally, independence of observations was assumed as participants were directed to respond to questions on their own and without speaking to classmates.

Preliminary Analyses

Descriptive statistics and Pearson Product Moment correlations were conducted among the variables of interest for the entire sample (please see Table 1 and 2).

Examination of Table 2 demonstrates that the variables of interest are correlated in the hypothesized direction. Restraint and emotional eating were positively associated with the silencing the self subscales, as well as the variables relating to anger regulation. In addition, body-esteem was negatively associated with these disordered eating indices. Restraint and emotional eating scores were differentially correlated with anger-expression, as restraint was more strongly related to anger-in, while emotional eating was more strongly related to anger-out.

As the sample was comprised of young girls from grades seven to twelve, age related differences were examined. Participants were grouped based on school structure (elementary school versus high school) into one of two groups: Early adolescence (grades seven and eight, $n = 636$) and mid-late adolescence (grades nine to twelve, $n = 681$). Descriptive statistics were then computed for each age group in order to examine general trends among each age group (please see Table 3).

Table 1.

Descriptive Statistics for Restrained Eating, Emotional Eating, Self-Silencing, Externalized Self-Perception, Care as Self-Sacrifice, Anger-In, Anger-Out, and Body Esteem

	Mean	SD	Range
Restrained Eating	1.85	.81	1 – 5
Emotional Eating	1.95	.84	1 – 5
Self-Silencing	9.62	2.95	4 – 20
Externalized Self	15.84	5.30	7 – 35
Care as Self	12.28	2.90	4 – 20
Anger-In	15.13	4.42	8 - 32
Anger-Out	16.24	4.23	8 - 32
Body Esteem	3.37	.77	1 – 5

Table 2

Correlations among Restrained and Emotional Eating, the revised STSS-A subscales, the Anger-In and Anger-Out subscales of the State-Trait Anger Expression Inventory (S-TAXI), and Body Esteem

	1	2	3	4	5	6	7	8
1 Restraint	1	.25**	.21**	.35**	.12**	.32**	.19**	-.51**
2 Emotional	-	1	.20**	.35**	.12**	.40**	.28**	-.35**
3 Self Silencing	-	-	1	.60**	.40**	.37**	.00	-.31**
4 Externalized Self	-	-	-	1	.24**	.54**	.17**	-.56**
5 Care as Self	-	-	-	-	1	.17**	.06*	-.16**
6 Anger-In	-	-	-	-	-	1	.34**	-.47**
7 Anger-Out	-	-	-	-	-	-	1	-.28**
8 Body Esteem	-	-	-	-	-	-	-	1

Note. 1, 2 subscales of the Dutch Eating Behaviour Questionnaire; 3,4,5 subscales of the revised STSS-A; 6,7, subscales

of anger expression scale; 8, Body Esteem.

* $p < .05$. ** $p < .001$.

Table 3.

Descriptive Statistics for Age, Restrained Eating, Emotional Eating, Self-Silencing, Externalized Self-Perception, Care as Self-Sacrifice, Anger-In, Anger-Out, and Body Esteem for the Entire Sample

		Mean	SD
Grades 7 & 8	Age	13.03	.66
	Restrained Eating	1.69 _a	.70
	Emotional Eating	1.76 _b	.75
	Externalized Self	15.44 _c	5.24
	Self-Silencing	9.73	2.98
	Care as Self	12.27	2.90
	Anger-In	14.40 _d	4.30
	Anger-Out	15.55 _e	3.82
	Body Esteem	3.50 _f	.77
Grades 9 to 12	Age	15.40	1.30
	Restrained Eating	2.01 _a	.89
	Emotional Eating	2.13 _b	.88
	Externalized Self	16.23 _c	5.34
	Self-Silencing	9.52	2.92
	Care as Self	12.29	2.90
	Anger-In	15.85 _d	4.44
	Anger-Out	16.90 _e	4.48
	Body Esteem	3.27 _f	.76

Note. Means in a row with similar subscripts are significantly different ($p < .01$).

In order to examine whether or not there were significant differences between the two groups, a one-way analysis of variance (ANOVA) was performed. The independent variable was the group based on grade, which had two levels, early adolescence and mid-late adolescence, and the six dependent variables were externalized self-perception, self-silencing, care as self-sacrifice, anger-in, anger-out, and body esteem. There were

significant mean differences between the groups on the majority of the dependent variables. Significant differences were found on levels of: restraint $F(1, 1315) = 50.70, p < .001$; emotional eating $F(1, 1315) = 68.93, p < .001$; externalized self-perception $F(1, 1315) = 8.05, p < .01$; anger-in $F(1, 1315) = 38.00, p < .001$; anger-out $F(1, 1315) = 33.16, p < .001$; and, body-esteem $F(1, 1315) = 24.78, p < .001$. However, no significant differences were found on levels of silencing the self ($p > .05$) or care as self-sacrifice ($p > .05$). Older girls reported greater levels of self-silencing, higher scores on anger expression and lower perceived body-esteem (see Table 3).

Although the results of the ANOVA revealed significant mean differences between the age groups, examination of the Pearson Product Moment correlations between each of the groups reveals that the direction of the relations between the variables was similar (please see Tables 4 and 5).

Table 4.

Correlations among Restrained and Emotional Eating, the revised STSS-A subscales, the Anger-In and Anger-Out subscales of the State-Trait Anger Expression Inventory (S-TAXI), and Body Esteem for Participants in Early Adolescence (grades seven and eight)

	1	2	3	4	5	6	7	8
1 Restraint	1	.22**	.20**	.27**	.17**	.31**	.26**	-.53**
2 Emotional	-	1	.20**	.32**	.10**	.36**	.32**	-.39**
3 Self Silencing	-	-	1	.64**	.35**	.34**	-.003	-.30**
4 Externalized Self	-	-	-	1	.24**	.48**	.16**	-.50**
5 Care as Self	-	-	-	-	1	.12**	.06	-.16**
6 Anger-In	-	-	-	-	-	1	.37**	-.44**
7 Anger-Out	-	-	-	-	-	-	1	-.35**
8 Body Esteem	-	-	-	-	-	-	-	1

Note. 1,2 subscales of the Dutch Eating Behaviour Questionnaire; 3,4,5 subscales of the revised STSS-A;

6,7, subscales of anger expression scale; 8, Body Esteem.

* $p < .05$. ** $p < .001$.

Table 5.

Correlations among Restrained and Emotional Eating, the revised STSS-A subscales, the Anger-In and Anger-Out subscales of the State-Trait Anger Expression Inventory (S-TAXI), and Body Esteem for Participants in Mid-Late Adolescence (grades nine to twelve)

	1	2	3	4	5	6	7	8
1 Restraint	1	.21**	.24**	.35**	.09*	.29**	.10*	-.49**
2 Emotional	-	1	.23**	.31**	.15**	.36**	.21**	-.29**
3 Self Silencing	-	-	1	.65**	.44**	.43**	.01	-.34**
4 Externalized Self	-	-	-	1	.24**	.55**	.09*	-.52**
5 Care as Self	-	-	-	-	1	.23**	.06	-.16**
6 Anger-In	-	-	-	-	-	1	.29**	-.47**
7 Anger-Out	-	-	-	-	-	-	1	-.20**
8 Body Esteem	-	-	-	-	-	-	-	1

Note. 1,2 subscales of the Dutch Eating Behaviour Questionnaire; 3,4,5 subscales of the revised STSS-A; 6,7, subscales of anger expression scale; 8, Body Esteem.

* $p < .05$. ** $p < .001$.

Categorization of Groups

As the main purpose of this study was to identify different patterns of eating disorder symptomatology, the main analyses were focused on the classification of participants, into different groups, representing different typologies of eating disorder symptomatology. More specifically, while Restraint and Emotional eating are both indicators of eating disorder symptomatology, it was expected that these variables would be differentially related to predictor variables, and thus representative of different ‘types’ of eating disorders.

The DEBQ-Restraint and Emotional Eating subscales were used to categorize the participants into the three groups of interest. In order to form groups which were representative of those who scored high on Emotional Eating and/or Restraint, participants were classified as Restrained eaters if they scored greater or equal to the 75th percentile on the restraint subscale, and less than or equal to the 50th percentile on emotional eating subscale of the DEBQ ($n = 104$, M age = 14.48). Similarly, participants were classified in the Emotional Eaters group had they scored greater or equal to the 75th percentile on the emotional eating subscale, and less than or equal to the 50th percentile on the restraint subscale of the DEBQ ($n = 125$, M age = 14.52). This was following the work of Zaitsoff and colleagues (2002), whose study involved a community sample of adolescent females who were grouped according to their scores on a measure of disordered eating behaviours, with those who scored above the 80th percentile placed into one group, and compared to those who were below the 80th percentile. Finally, a healthy control group was formed by selecting those participants who had scored less than or equal to the 50th percentile on both the restraint and emotional eating subscales of the

DEBQ ($n = 396$, M age = 13.71). Descriptive statistics and frequencies were then calculated for each of the three groups (please see Table 6 and 7).

Table 6.

Descriptive Statistics for Restrained Eating, Emotional Eating, Self-Silencing, Externalized Self-Perception, Care as Self-Sacrifice, Anger-In, Anger-Out, and Body Esteem for each Extreme Eating Behaviour Group

Extreme Groups		Restrained Eaters ($n = 104$)	Emotional Eaters ($n = 125$)	Healthy Eaters ($n = 396$)
	Age	14.50 (1.70)	14.53 (1.56)	13.71 (1.34)
	Restrained Eating	2.98 (.61)	1.25 (.20)	1.24 (.19)
	Emotional Eating	1.32 (.23)	3.20 (.67)	1.25 (.22)
	Self-Silencing	10.14 (2.42)	9.91 (3.13)	8.74 (3.00)
	Externalized Self	16.52 (5.22)	16.90 (5.27)	13.57 (5.00)
	Care as Self	13.00 (2.90)	12.53 (2.74)	11.90 (3.10)
	Anger-In	15.40 (4.52)	16.70 (4.65)	12.92 (3.60)
	Anger-Out	16.75 (4.24)	17.70 (4.34)	14.71 (3.60)
	Body Esteem	2.97 (.75)	3.35 (.72)	3.83 (1.34)

Table 7.

Frequencies of Elementary and Secondary Grade Distribution within each Extreme Eating Behaviour Group

	Restrained Eaters (<i>n</i> = 104)	Emotional Eaters (<i>n</i> = 125)	Healthy Eaters (<i>n</i> = 396)
Grade 7 & 8	45 (43.3%)	45 (36.0%)	257 (63.8%)
Grade 9 - 12	59 (56.7%)	80 (64%)	146 (36.2%)

In order to verify that this method of categorization was statistically sound, the dataset was subjected to cluster analysis. K-means cluster analysis was utilized in order to identify homogeneous groups of participants based on their levels of restrained and emotional eating (Rapkin & Luke, 1993). The results of the cluster analysis supported three distinct groups, which corresponded to the three groups of interest. Cluster 1 (*n* = 771, *M* age = 13.93) comprised of females who had low scores on both emotional and restrained eating (i.e., “healthy eaters”). Cluster 2 (*n* = 260, *M* age = 14.60) was composed of females who had scored high on emotional eating and had an average score on restrained eating (i.e., “emotional eaters”). Cluster 3 (*n* = 286, *M* age = 14.74) was comprised of females who had high scores on restraint, and average scores on emotional eating (i.e., “restrained eaters”). Descriptive statistics and frequencies were then calculated for each of the three clusters (please see Table 8 and 9).

Table 8.

Descriptive Statistics for Restrained Eating, Emotional Eating, Self-Silencing, Externalized Self-Perception, Care as Self-Sacrifice, Anger-In, Anger-Out, and Body Esteem for each Cluster

		Restrained Eaters (<i>n</i> = 286)	Emotional Eaters (<i>n</i> = 260)	Healthy Eaters (<i>n</i> = 771)
Clusters	Age	14.74 (1.60)	14.60 (1.62)	13.93 (1.47)
	Restrained Eating	3.10 (.62)	1.69 (.54)	1.45 (.38)
	Emotional Eating	2.19 (.70)	3.11 (.69)	1.50 (.39)
	Self-Silencing	10.60 (2.82)	10.27 (2.94)	9.10 (2.90)
	Externalized Self	18.36 (5.39)	17.43 (5.00)	14.40 (4.90)
	Care as Self	12.62 (2.82)	12.71 (2.77)	12.00 (2.93)
	Anger-In	17.00 (4.44)	17.26 (4.44)	13.72 (3.82)
	Anger-Out	17.20 (4.54)	17.72 (4.39)	15.37 (3.80)
	Body Esteem	2.78 (.68)	3.19 (.69)	3.65 (.68)

Table 9.

Frequencies of Elementary and Secondary Grade Distribution within each Cluster

	Restrained Eaters (<i>n</i> = 286)	Emotional Eaters (<i>n</i> = 260)	Healthy Eaters (<i>n</i> = 771)
Grade 7 & 8	95 (33.2%)	94 (36.2%)	447 (58.0%)
Grade 9 - 12	191 (66.8%)	166 (63.8%)	324 (42.0%)

The results of the K-means cluster analysis supported the categorization of participants based on their levels of restrained and emotional eating. The frequencies of the extreme groups were then separated by clusters in order to ensure that the clusters corresponded to the extreme groups. 100% of the emotional eating extreme groups fell into the emotional eating cluster and 80% of those in the restrained eating extreme group were correctly clustered, with 20% of the group being clustered with the healthy eating group. Given that the overall goal of the study was to compare groups based on their levels of restrained and emotional eating, the extreme eating groups, which were formed using percentile scores, were retained and utilized for the remainder of the analyses. Therefore, for the remaining analyses extreme groups (*N* = 625) was utilized.

Factorial MANOVA

A multivariate analysis of variance (MANOVA) was performed in order to examine whether or not there were differences among the restrained eaters, emotional eaters, and healthy eaters on multiple levels of self-silencing, emotional regulation, and body esteem¹. A 2 x 3 factorial design was utilized, with the independent variables being

¹ In order to ensure that similar results would be obtained if the clusters, which were formed from the entire sample, were utilized (as opposed to the extreme groups) a factorial MANOVA was also conducted using

the eating behaviour groups (i.e., restrained eaters, emotional eaters, and healthy eaters) and grade (i.e., elementary versus secondary grades). The six dependent variables included the three subscales of the STSS-A, externalized self-perception, self-silencing, and care as self-sacrifice, along with the two subsections of the STAXI, anger-in and anger-out, and body esteem. Results of the Wilk's lambda multivariate tests revealed that the composite DV was significantly affected by both eating behaviours, Wilk's $\Lambda = .73$, $F(12, 1224) = 17.39$, $p < .001$, and grade, Wilk's $\Lambda = .94$, $F(6, 612) = 6.82$, $p < .001$, but not by their interaction, Wilk's $\Lambda = .97$, $F(12, 1224) = 1.64$, $p = .075$. The results indicated that there was a modest association between eating behaviour groups (restraint vs. emotional vs. healthy eaters) and the composite DV, partial $\eta^2 = .15$, with a much weaker association between grade (elementary versus secondary) and the composite DV, partial $\eta^2 = .06$. For the nonsignificant interaction, partial $\eta^2 = .016$.

In order to explore the significant main effects, the univariate between-subject tests were examined to further investigate the significance between the IVs and individual DVs. The eating behaviours IV was found to be significantly associated with each DV, including silencing the self ($p < .001$, partial $\eta^2 = .06$), externalized self ($p < .001$, partial $\eta^2 = .08$), care as self ($p < .001$, partial $\eta^2 = .03$), anger-in ($p < .001$, partial $\eta^2 = .11$), anger-out ($p < .001$, partial $\eta^2 = .07$), and body-esteem ($p < .001$, partial $\eta^2 = .16$).

the clusters (with three levels) and grade (with two levels) as the independent variables. There was a marginally significant interaction between the two IVs ($p = .047$), however univariate between-subjects tests showed that there were no significant differences between the interaction term and any of the dependent variables.

Grade was found to differ significantly on levels of silencing the self ($p < .01$, partial $\eta^2 = .02$), care as self-sacrifice ($p < .01$, partial $\eta^2 = .01$), anger-in ($p < .01$, partial $\eta^2 = .02$), and anger-out ($p < .01$, partial $\eta^2 = .02$). However, neither externalized self-perception ($p = .53$, partial $\eta^2 = .001$), or body-esteem ($p = .52$, partial $\eta^2 = .001$) was found to predict differences between those in the younger versus the older grades.

Examining the means for the groups separated by grades, females in the younger grades reported higher levels of self-silencing ($M = 9.44$, $SD = 3.00$) and care as self-sacrifice ($M = 12.37$, $SD = 3.02$), but lower levels of anger-in ($M = 13.30$, $SD = 3.85$) and anger-out ($M = 14.90$, $SD = 3.58$) (please see Table 10).

Table 10.

Means and Standard Deviations of the Dependent Variables, Self-Silencing, Externalized Self-Perception, Care as Self-Sacrifice, Anger-In, Anger-Out, and Body Esteem by Elementary and Secondary Grades

	Grades 7 & 8		Grades 9 – 12	
	(n = 340)		(n = 285)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-Silencing	9.44 _a	3.00	8.93 _b	2.90
Externalized Self	14.10	5.10	15.20	5.51
Care as Self	12.37 _a	3.02	12.02 _b	3.00
Anger-In	13.30 _a	3.85	15.00 _b	4.60
Anger-Out	14.90 _a	3.58	16.60 _b	4.40
Body Esteem	3.70	.72	3.47	.80

Note. Means in a row with different subscripts are significantly different ($p < .01$).

Post-hoc Analyses

In order to investigate which of the DVs were affected by the eating behaviours groups, multiple comparisons were performed. Given the exploratory nature of this research all pairwise comparisons were of interest and therefore a Bonferroni correction was used, which uses an adjusted, more stringent alpha level in order to control against Type I error. The results indicated that there were significant mean differences between the healthy eating group and the two disordered eating groups (i.e., restrained and emotional eating groups) on each of the six DVs, in that the healthy eating groups reported lower levels of self-silencing, anger-in, and anger-out, as well as higher levels of body-esteem (please see Table 11).

Table 11.

Means and Standard Deviations of the Dependent Variables, Self-Silencing, Externalized Self-Perception, Care as Self-Sacrifice, Anger-In, Anger-Out, and Body Esteem by Extreme Eating Behaviour Groups

	Healthy Eaters		Emotional Eaters		Restrained Eaters	
	(n = 396)		(n = 125)		(n = 104)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-Silencing	8.74 _a	3.00	9.91 _b	3.13	10.14 _b	2.42
Externalized Self	13.57 _a	5.00	16.90 _b	5.27	16.52 _b	5.22
Care as Self	11.90 _a	3.10	12.53 _b	2.74	13.00 _b	2.90
Anger-In	12.92 _a	3.60	16.70 _b	4.65	15.40 _{b,c}	4.52
Anger-Out	14.71 _a	3.60	17.70 _b	4.34	16.75 _b	4.24
Body Esteem	3.83 _a	1.34	3.35 _b	.72	2.97 _{b,c}	.75

Note. Means in a row with different subscripts are significantly different ($p < .05$).

Furthermore, there were significant differences between the restrained eating and emotional eating groups on levels of anger-in and body-esteem, with restrained eaters scoring lower on levels of anger suppression ($M = 15.40$, $SD = 4.52$), than emotional eaters ($M = 16.70$, $SD = 4.65$), and lower on feelings of positive body-esteem ($M = 2.97$, $SD = .75$), than emotional eaters ($M = 3.35$, $SD = .72$).

Summary

A MANOVA was performed in order to examine the mean differences on the variables of interest, while also investigating whether or not the mean differences between groups varied as a function of grade (i.e., whether or not there was an interaction

between eating behaviour groups and grade). Given that there was not a significant interaction, grade of participants was not considered for the remaining analyses and the focus was placed on differentiating between the eating behaviour groups on factors of self-silencing, anger expression and suppression, and body-esteem.

Discriminant Function Analysis

A DFA was performed in order to determine whether or not restrained, emotional, and healthy eaters could be reliably classified from a set of predictors. DFA enables us to determine the relative importance of the DVs in discriminating among eating behaviour groups. Subsequently, the DVs (i.e., silencing the self, externalized self-perception, care as self-sacrifice, anger-in, anger-out, and body esteem) were treated as predictors to examine how they were able to predict group membership for the three eating behaviours groups (restrained, emotional, and healthy eaters). Univariate F tests were calculated in order to determine the importance of each IV in forming the discriminant functions. Wilk's Λ was significant by the F tests for each of the predictors, supporting the inclusion of each of the variables in discriminating between groups, as well as classifying cases into their correct groups (see Table 12). Additionally, examining the Wilk's Λ values for each of the predictors reveals how important the IV is to the discriminant function, with smaller values representing greater importance. Thus, according to the results of the F tests, by order of importance the predictors in the model include: body-esteem, anger-in, anger-out, externalized self-perception, self-silencing, and care as self-sacrifice (see Table 12).

Two discriminant functions were revealed with a combined $\chi^2(12) = 140.68, p < .001$. After removal of the first function, there was still a significant association between

groups and predictors, $\chi^2(5) = 34.33, p < .001$. Canonical $R^2 = .25$ for the first function and .06 for the second function, indicating that the two functions accounted for about 25% and 6% of the total relationship between predictors and groups. The two discriminant functions accounted for 84.3% and 15.7%, respectively, of the between group variance. The first discriminant function served to maximally discriminate between the healthy eating group and the two unhealthy eating groups (i.e., restrained and emotional eaters), while the second discriminant function differentiated between the restrained and emotional eaters.

Examining the structure loadings of greater than .30 between predictors and discriminant function one (please see Table 12), suggests that the best predictors for distinguishing between healthy eaters and the other two groups (first function) are body-esteem, anger-in, anger-out, externalized self-perception, and self-silencing. Healthy eaters report higher levels of body-esteem ($M = 3.84, SD = .65$) than emotional eaters ($M = 3.35, SD = .72$) or restrained eaters ($M = 2.98, SD = .75$), lower levels of anger suppression ($M = 12.94, SD = 3.60$), than emotional eaters ($M = 16.70, SD = 4.65$) or restrained eaters ($M = 15.34, SD = 4.43$), as well as lower levels of anger expression ($M = 14.73, SD = 3.60$), than emotional eaters ($M = 17.67, SD = 4.34$) or restrained eaters ($M = 16.82, SD = 4.24$), lower levels of externalized self-perception, ($M = 13.34, SD = 4.87$), than emotional eaters ($M = 16.86, SD = 5.24$) or restrained eaters ($M = 16.36, SD = 5.24$), and lower levels of self-silencing, ($M = 8.74, SD = 2.94$), than emotional eaters ($M = 9.91, SD = 3.13$) or restrained eaters ($M = 10.14, SD = 2.42$).

Three predictors, anger-in, anger-out, and body-esteem had loadings in excess of .30 on the second discriminant function, which separates emotional eaters from restrained

eaters. Emotional eaters reported greater levels of anger suppression and anger expression than restrained eaters, who reported lower levels of body-esteem (means cited above).

Additionally, looking at the standardized canonical discriminant function coefficients in Table 12 suggests that the variables which contribute the most to discriminant function one (after controlling for the presence of the other variables) are body-esteem, anger-out, and anger-in. Additionally, the variables which contribute the most to discriminant function two (after controlling for the presence of the other variables), are body-esteem, anger-in externalized self-perception, and anger-out, with body-esteem contributing negatively (i.e., lower levels of body-esteem discriminating between groups) and anger-in, anger-out and externalized self-perception contributing positively to the distinction between emotional eaters and restrained eaters.

Therefore, the three groups of adolescent females differ most notably on their levels of anger regulation and body-esteem. Healthy eaters were more likely to report higher levels of body-esteem, and lower levels of self-silencing behaviours, as well as anger expression and suppression. When comparing emotional and restrained eaters, emotional eaters were more likely to report higher levels of body-esteem, anger suppression and expression, as well as externalized self-perceptions.

Upon examination of the classification procedure, 61.6% of the originally grouped cases were classified correctly. Results revealed that 49% of the restrained group, 46.4% of the emotional eating group, and 70% of the healthy eating group were correctly classified using participants' scores on factors of self-silencing, anger suppression and expression, and body-esteem. Misclassifications were also identified revealing that the majority of those who were misclassified into the restrained eating

group were emotional eaters (30.4%), as compared to healthy eaters (20.6%). Those who were misclassified by being put into the emotional eating group included 27.2% healthy eaters, and 26.4% restrained eaters. Finally, 14.14% of restrained eaters and 23.19% of emotional eaters were misclassified and put into the healthy eating group.

In order to cross-validate these results, a jackknifed quadratic classification procedure was conducted in order to check the predictive accuracy. The jackknifed procedure cross-validates the classification results by classifying a case into a group which was based on the discriminant function calculated by using all of the cases in the sample except that case that is being classified (Tabachnick & Fidell, 2007). Results indicated that 60.7% of the cross-validated group was correctly classified.

Table 12.

Results of the Discriminant Function Analysis of Extreme Eating Behaviour Groups

Predictor Variable	Standardized Canonical Discriminant Function Coefficients		Correlations of Predictor Variables with Discriminant Functions		Wilk's Λ	Univariate $F(2, 620)$
	1	2	1	2		
Externalized-Self	.000	.413	.537	.240	.908	31.74**
Self-Silencing	.128	-.145	.365	-.014	.957	14.04**
Care as Self	.094	-.158	.250	-.163	.978	7.13*
Anger-In	.297	.635	.636	.552	.865	48.60**
Anger-Out	.399	.323	.535	.382	.904	32.95**
Body Esteem	-.637	.852	-.828	.469	.802	76.57**
Canonical R	.504	.244				
Eigenvalue	.340	.063				

Note. * $p < .01$, ** $p < .001$.

Discussion

The main goal of the current study was to examine how factors of self-silencing, anger suppression and expression, and body-esteem were able to differentially predict patterns of eating disordered behavior among adolescent females. It was expected that dietary restraint and emotional eating, although both indicators of eating disorder symptomatology, would have differential patterns of predictor variables. The sample was utilized in order to form three subgroups of interest: 1) those who scored high on measures of restraint, and low on emotional eating (i.e., restrained eaters); 2) those who scored high on emotional eating, and low on measures of restraint (i.e., emotional eaters); and, 3) those who scored low on levels of restraint and emotional eating (i.e., healthy eaters). Using stringent cut-offs, 7.9% of the original sample was categorized as restrained eaters, 9.5% of the sample was placed into the emotional eaters group, with 30.1% of the original sample identified as healthy eaters. Results presented provide empirical evidence, which confirm the validity and clinical distinctiveness of these subgroups.

The first objective of the study was to examine how the constructs of self-silencing (i.e., externalized self-perception, silencing the self, and care as self-sacrifice), differed between the three eating behaviour groups. Previous research supported the hypothesis that externalized self-perception would be an important factor in discriminating among healthy and unhealthy eating groups. As hypothesized, healthy eaters scored significantly lower on overall levels of self-silencing than either the restrained or emotional eaters. Furthermore, externalized self-perception was found to be the most important self-silencing construct in differentiating between groups, that is,

those who engage in either restrained or emotional eating were more likely (than healthy eaters) to judge themselves based on the opinions of others.

These results are in support of previous research which has found that eating pathology is positively related to self-silencing (Buchholz et al., 2007), and that externalized self-perception is typically the most important predictor, compared to either silencing the self or care as self-sacrifice (Buchholz et al., 2007; Lieberman et al., 2001).

When comparing the differences between the restrained and emotional eaters, emotional eaters reported greater levels of externalized self-perception and self-silencing than the restrained eating group. These findings uniquely contribute to the existing literature, as previous research has not compared restrained versus emotional eaters. As these behaviours are more indicative of the "perfect" self that females are socially reinforced to attain, the results indicate that emotional eaters are more likely to present an outwardly compliant self in an effort to be accepted by others. It is possible that emotional eaters are more likely to present the outwardly acceptable self and cope with their true, suppressed, emotions by engaging in emotional eating.

The second objective of the current study was to examine the role of anger in relation to disordered eating. Consistent with what was expected, restrained and emotional eaters reported higher levels of anger suppression and expression, compared to the healthy eating group. These findings are in support of previous research that has found anger to be related to eating pathology in both female adolescents (Zaitsoff et al., 2002) and adults (Fox & Harrison, 2008; Geller et al., 2000).

It was hypothesized that anger suppression and expression would also differentiate between the restrained and emotional eaters. As restrained eaters are thought

to suppress their feelings of hunger, it was expected that this group would be more likely to suppress their true feelings of anger, and therefore report higher levels of anger suppression than emotional eaters. In contrast to what was expected, emotional eaters reported higher levels of anger suppression than the restrained eating group. Although contrary to the hypothesis, these findings are in line with some of the previous research, which has found anger suppression to be positively associated with bulimic attitudes and behaviours (Fassino et al., 2001; Milligan & Waller, 2001). These studies are in support of the current findings, as the emotional eating group is thought to be more likely to engage in bulimic behaviours. While a study by Geller and colleagues (2000) found that participants with AN reported higher levels of anger suppression than a control group, this study did not include participants with BN, and therefore no comparison between the two eating disorders can be made from this study.

Additionally, it was expected that anger-out would be higher among those in the emotional eating group, as compared to the restrained eating group, as emotional eaters were expected to report greater levels of outward anger, which corresponded to their higher reports of emotional eating. Consistent with what was expected, emotional eaters reported higher levels of anger expression, however there was not a significant difference between emotional and restrained eaters. Therefore, while these findings support the idea that anger is an important construct in relation to disordered eating, the results of the current study suggest that anger suppression may have a more central role in the development and maintenance of disordered eating behaviours. In particular, anger suppression may be an important variable that is able to distinguish among specific types of disordered eating behaviours.

These results indicate that the emotional eaters were more likely to report greater levels of anger overall. That the emotional eating group reported higher levels of externalized self-perception, anger suppression and anger expression may seem counterintuitive, however, similar results were found by Tan and Carfagnini (2008), who reported that women who were high in depression also reported the highest levels of self-silencing behaviours, anger suppression and anger expression, compared to moderately and non-depressed women. It is possible that in an attempt to portray the “perfect” self, females constantly attempt to suppress their feelings of anger, but such attempts are interrupted by bouts of uncontrollable anger, which they are unable to suppress. Additionally, it is likely that it is this loss of control that may lead to emotional eating.

In general, the findings from the current study are in direct accordance with Fassino and colleagues (2001) who compared participants with different clinical eating disorders, and found that those with BN reported greater levels of anger suppression and expression, compared to participants with AN and the control group.

The final objective of the current study was to examine the role of body-esteem in discriminating between the eating behaviours groups. Given that past research has found a strong relationship between low body-esteem and disordered eating it was expected that healthy eaters would report greater levels of body-esteem than either the emotional or restrained eating groups. The results demonstrated support for the final hypothesis. As expected, the healthy group reported higher levels of body-esteem than the emotional or restrained eating groups. This finding is in line with previous research which has shown that low body-esteem is a strong risk factor for the development of disordered eating behaviours (Attie & Brooks-Gunn, 1989; Leon et al., 1993).

Additionally, it was expected that the restrained eaters would report significantly lower levels of body-esteem than the emotional eaters, as it was believed that females who pose restrictions on their dietary intake are more likely to feel dissatisfied with their body, than those females who engage in emotional eating. Consistent with what was expected, the restrained eaters reported significantly lower levels of body-esteem than the emotional eaters. While it is interesting that the restrained eaters reported lower levels of self-silencing and anger suppression than the emotional eaters, it may be that this group of adolescent females is less in tune with their true thoughts and feelings. Restrained eaters may have lower interoceptive awareness, which is the ability to distinguish between internal cues, such as hunger, and emotional states. Interoceptive awareness has been found to be strongly associated with disordered eating in adolescent females (Leon, Fulkerson, Perry, & Early-Zald, 1995). However, it is believed that restrained eaters would be in tune with their negative perceptions about their body and would be able to accurately report on their feelings of body dissatisfaction, as these beliefs would play a role in their daily lives and may be a primary reason for their dietary restraint.

Implications

Self-silencing has been implicated in eating disorders, as it is believed that females who constantly place others before themselves, and present an outwardly "perfect" self, suppress their negative thoughts and feelings and in turn displace them onto their body. This may lead to lower body-esteem and dietary restraint, as seen in the restrained eaters group, or females may learn to cope with their negative feelings through eating, as seen in the emotional eaters group. These findings have implications for the development, and improvement of prevention and intervention programs for adolescent females. It is

believed that such programs would be most effective if they were to take place within the schools where guidance counselors and/or school psychologists could work in conjunction with the teachers, parents, and students. Furthermore, the results of this study provided support for including factors such as interpersonal orientation and emotional regulation in these programs. It is important that females are taught how to express their true thoughts and emotions. Females must learn that it is acceptable and healthy to voice their opinions and express their feelings, both positive and negative. Furthermore, it is thought that these skills will help them to feel more confident about themselves, and in turn, about their bodies. In summary, these programs should focus on helping females learn to believe that they are beautiful on the inside, so that their inner self-esteem will be reflected on the outside, thus making them feel better about themselves as a whole.

Limitations and Future Research

One limitation of the current study is that males were not included. Given the exploratory nature of the study, and that disordered eating behaviours are still much more prevalent in females it was deemed important to place the focus solely on females. However, given that the incidence rates of disordered eating behaviours and clinical eating disorders among males are rising, future research should explore these relations among males.

The results of the DFA indicated that 61.6% of the original cases were correctly classified into their respective groups. These results are consistent with previous studies that have examined individual predictors of disordered eating, which have resulted in approximately 63.4% to 75.3% of correct classifications (Mack, Strong, Kowalski, & Crocker, 2006; Fairburn, Cooper, Doll, & Davies, 2005; Thurfjell, Eliasson, Swenne, von

Knorring, & Engstrom, 2006). However, these results indicate that there are other factors which were not included in the present study that may have contributed to the correct classification of cases into their respective subgroups. Future research should investigate these predictors, as well as different proximal factors of disordered eating in order to better understand the differences between healthy, restrained and emotional eaters.

Conclusion

The present study was the first study of its kind which attempted to identify how factors relating to one's interpersonal orientation, emotional regulation, and body-esteem are able to differentiate between different eating behaviour groups. The results suggested that while restrained and emotional eaters were quite similar on a number of levels, they were consistently, and significantly, different than the healthy eating group. More specifically, these findings indicate that females who report disordered eating behaviours are more likely to put others feelings and needs in front of their own, report lower levels of body-esteem, and greater levels of anger suppression and expression. The variables that differentiated between restrained and emotional eaters included body-esteem, anger-in, externalized self-perception, and anger-out. Restrained eaters reported lower levels of body-esteem, while emotional eaters were more likely to judge themselves based on the opinions of others, and reported greater levels of anger, both anger-in and anger-out. The results of the present study may be applied to help identify females who are at a risk of engaging in disordered eating behaviours, and subsequently at risk of developing an eating disorder.

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Appendix A: Consent and Assent Forms

University of Ottawa
Institute of Mental
Health Research

Research on Eating and Adolescent Lifestyle

REAL Study

INFORMATION DOCUMENT

Research Team

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Dear parent/guardian, and student,

Dr. Martine Flament and a research team from the University of Ottawa Institute of Mental Health Research at the Royal Ottawa Hospital, and the Children's Hospital of Eastern Ontario (CHEO) in Ottawa, are doing a study on self-image and eating behaviours in adolescents. The project will help determine if lifestyle plays a role in the development of healthy or unhealthy eating behaviours. In the end, we hope to understand how eating disorders develop, and how to prevent them.

We would like to collect information from adolescents from grade 7 to grade 12. To do so, a questionnaire package will be given out in classrooms of several schools in the Ottawa-Gatineau area. We are grateful that your school has agreed to participate. We hope you will choose to participate as well.

The questionnaire package asks about eating habits, dieting, self-esteem, body image, and relationships with family and peers. Because some of the questions can be personal, some students might feel uncomfortable. If this were to happen, we will do our best to help by answering any questions they might have during or after the survey.

All the answers to the survey package are confidential. Each package will be numbered and students will not be asked to write their name on it. No one besides the research team will have access to this information whether they are parents, teachers, or other students. The answers to the questionnaire packages will be kept in a secure place at the Royal Ottawa Hospital, and will be used for this research only. However, if any of the answers indicate that a student may be in serious danger (one or of the following situations: wants to kills him/herself, diagnosable depressive, anxiety or eating disorder), a member of the research team will get in touch, individually and confidentially, with him/her (if aged 16 or above) or a parent/guardian (if under 16), and offer clinical backup to ensure that the participant is provided with the proper environmental and/or professional support. As an additional safeguard after the survey, all

participants will be given a “thank you” letter including the name and address of at least one member of the research team, should they wish to make future contact.

The questionnaire package will be given to the students in class, on _____ (date of administration). They will complete it during two regular class periods, and this will take about two hours. After the package is completed, we will measure each student’s height and weight. This procedure will be done individually and confidentially in a private space.

Students can stop participating at any time, or refuse to answer particular questions without penalty. Their decision will not affect their marks and will not appear on any school document. We ask parents and guardians of students below the age of 16 to indicate whether they want their child to participate or not in this study by signing a consent form. Students will also be able to indicate whether they want to participate or not before the questionnaire package is distributed. Students who choose not to participate will remain in the classroom to complete schoolwork.

When the research is completed, results for the entire group of participants as a whole, will be available to schools, parents, and students who are interested.

The study has been approved by the Research Ethics Boards of the Royal Ottawa Hospital and the Children’s Hospital of Eastern Ontario (CHEO). It has also been accepted by the School Board (name), as well as your own school. For any questions about ethical considerations, you may call Dr. Alan Douglass, Chair of the Royal Ottawa Hospital Research Ethics Board at (613) 722-6521 ext. 6226, or Dr. Carole Gentile, Chair of the CHEO Ethics Board at (613) 737-7600 ext. 3272.

For any other questions, please call Dr. Martine Flament (Principal Investigator) at (613) 722-6521 ext. 6436.

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Research on Eating and Adolescent Lifestyle
REAL Study

**CONSENT FORM FOR PARENTS/GUARDIANS OF STUDENTS BELOW
THE AGE OF 16**

I have read and I understand the information document concerning the study on self-image, eating behaviours, and lifestyle in adolescents. I have had the opportunity to ask questions, and I know everything I need to know in order to decide whether or not my child should participate in this study.

I understand that a questionnaire package will be administered in my child's classroom. It will contain certain questions of a personal nature on many aspects of his/her life style and eating habits. I have been assured that every effort will be made to minimize any discomfort that could be caused by certain of the questions. I have also been advised that participation in this study is completely voluntary and that my child has the right not to participate, to withdraw consent and discontinue participation at any time, or to refuse to answer particular questions without any negative effect on his/her marks, relationship with teachers, or academic record.

Every student in the classroom who has agreed to participate will be given a questionnaire package and will have to hand it in at the end of the period. A number will be assigned to the questionnaire packages and my child will not be asked to write his/her name on any part of it. After the package is completed, a researcher will measure my child's height and weight. This procedure will be done individually and confidentially in a private space.

I have been assured that all answers will remain confidential and that the questionnaire package will be kept in secure location that is only accessible to the researchers. However, if any of the answers indicate that my child may be in serious danger (one or of the following situations: wants to kills him/herself, diagnosable depressive, anxiety or eating disorder), a member of the research team will get in touch, individually and confidentially, with him/her (if aged 16 or above) or myself as parent/guardian (if my child is under 16), and offer clinical backup to ensure that my child is provided with the proper environmental and/or professional support. As an additional safeguard after the survey, all participants will be given a "thank you" letter including the name and address of at least one member of the research team, should they wish to make future contact.

If I have any questions about my child's rights as a study participant, I can call Dr. Martine Flament (Principal Investigator) at (613) 722-6521 ext. 6436.

Please turn over

Please choose one of the following options:

_____ I authorize my child to participate in this study

_____ I do not authorize my child to participate in this study

There are two copies of this consent form. Please return one to your child's school and keep the other for your files.

Name of child: _____

Name of Parent/Guardian: _____ Signature: _____ Date: _____

Investigator's name and signature: _____ Date: _____

Research on Eating and Adolescent Lifestyle

REAL Study

ASSENT FORM FOR STUDENTS BELOW THE AGE OF 16

I have read and I understand the information document concerning the study on self-image and eating behaviours in adolescents. I have had the opportunity to ask questions, and I know everything I need to know in order to decide whether or not I will participate in this study.

I understand that a questionnaire package will be given out to all students in my classroom. It will contain certain personal questions on many aspects of my life style and eating habits. I have been assured that researchers will make every effort to help me if certain questions make me uncomfortable. I have also been told that participation in this study is completely voluntary and that I have the right not to participate, to stop participating at any time, or to refuse to answer particular questions without any consequences.

Every student in the classroom who has agreed to participate will be given a questionnaire package and will have to hand it in at the end of the period. A number will be assigned to my questionnaire package and I will not be asked to write my name on any part of it. Once the package is completed, a researcher will measure my height and weight individually in a private space.

I have been assured that all answers will be kept confidential and that the questionnaire packages will be kept in secure location that is only accessible to the researchers. However, if any of my answers indicate that I may be in serious danger (such as, I want to harm myself or I suffer from a depressive, anxiety or eating disorder), a member of the research team will get in touch, individually and confidentially, with me and my parent/guardian, and offer clinical backup to ensure that I receive support and help.

If I have any questions about my rights as a study participant, I can call Dr. Martine Flament (Principal Investigator) at (613) 722-6521 ext. 6436 or Claudia Furino (Research Coordinator) at (613) 722-6521 ext. 6019.

I, _____ (your name), agree to participate in this study.

There are two copies of this form; you may keep one of them.

Signature: _____ Date: _____

Investigator's name and signature: _____ Date: _____

Research on Eating and Adolescent Lifestyle

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**Institute of Mental
Health Research**

Research on Eating and Adolescent Lifestyle
REAL Study

CONSENT FORM FOR STUDENTS ABOVE THE AGE OF 16 (INCLUSIVELY)

I have read and I understand the information document concerning the study on self-image and eating behaviours in adolescents. I have had the opportunity to ask questions, and I know everything I need to know in order to decide whether or not I will participate in this study.

I understand that a questionnaire package will be given out to all students in my classroom. It will contain certain personal questions on many aspects of my life style and eating habits. I have been assured that researchers will make every effort to help me if certain questions make me uncomfortable. I have also been told that participation in this study is completely voluntary and that I have the right not to participate, to stop participating at any time, or to refuse to answer particular questions without penalty.

Every student in the classroom who has agreed to participate will be given a questionnaire package and will have to hand it in at the end of the period. A number will be assigned to my questionnaire package and I will not be asked to write my name on any part of it. After the package is completed, a researcher will measure my height and weight. This procedure will be done individually and confidentially in a private space.

I have been assured that all answers will be kept confidential and that the questionnaire packages will be kept in secure location that is only accessible to the researchers. However, if any of my answers indicate that I may be in serious danger (such as, I want to harm myself or I suffer from a depressive, anxiety or eating disorder), a member of the research team will get in touch with me, individually and confidentially, and offer clinical backup to ensure that I receive support and help.

If I have any questions about my rights as a study participant, I can call Dr. Martine Flament (Principal Investigator) at (613) 722-6521 ext. 6436 or Claudia Furino (Research Coordinator) at (613) 722-6521 ext. 6019.

I, _____ (your name), agree to participate in this study.

There are two copies of this form; you may keep one of them.

Signature: _____ Date: _____

Investigator's name and signature: _____ Date: _____

University of Ottawa
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Research on Eating and Adolescent Lifestyle
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Participant “Thank-you” letter

Thank you for taking the time to be part of our study! We really appreciate your commitment and effort. As you know, we developed this study to look at self-image and eating behaviours in adolescents. It is our hope that your answers will help us determine what in the adolescent lifestyle may play a role in the development of his/her body image, and healthy or unhealthy eating behaviours.

Once the study is completed, the results will be shared in summary form – your identity will never be revealed. We will have a summary of the results available to schools, students and parents who are interested.

Before and after completion of the questionnaire package, you had the opportunity to ask the researchers questions about the study and discuss feelings you may have had as a result of some questions asked. However, should you later feel distressed or like you need to talk to someone about the study, please don't hesitate to call Dr. Martine Flament (principal investigator) at (613) 722-6521 ext. 6436, or Claudia Furino (research coordinator) at (613) 722-6521 ext. 6019. Again, thank you for taking the time to be part of our study!

Appendix B: Measures

Silencing the Self Scale for Adolescents (STSS-A)

Indicate **HOW MUCH YOU AGREE** with the following statements by circling the most appropriate number

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. Caring means putting the other person's needs in front of my own.....	1	2	3	4	5
2. I find it harder to be myself when I am with my friends than when I am on my own.....	1	2	3	4	5
3. I tend to judge myself by how I think my friends see me.....	1	2	3	4	5
4. I feel dissatisfied with myself because I am not able to do all the things students are supposed to do these days.....	1	2	3	4	5
5. In my friendships, my responsibility is to make the other person happy.....	1	2	3	4	5
6. Caring means choosing to do what my friends want even when I want to do something different.	1	2	3	4	5
7. I feel I have to act in a certain way to please my friends.....	1	2	3	4	5
8. In order for my friends to like me I cannot reveal certain things about myself to them.....	1	2	3	4	5
9. When my friends' opinions conflict with mine, rather than asserting my own point of view, I usually end up agreeing with them.....	1	2	3	4	5
10. When it looks as though the things I want in a friendship aren't there, I usually think that they weren't very important anyway.....	1	2	3	4	5
11. I feel that my friends do not really know who I am.....	1	2	3	4	5
12. I think it's better to keep my feelings to myself when they conflict with my friends'.....	1	2	3	4	5
13. When I'm with my friends I don't usually care what we do, as long as they are happy.....	1	2	3	4	5

14. I try to bury my feelings when I think they will cause trouble with my friends.....	1	2	3	4	5
15. I never seem to measure up to the standards I set for myself.....	1	2	3	4	5

Body Esteem Scale for Adolescents and Adults (BESAA)

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

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

Note. S = Seldom, O = Often

State Trait Anger Expression Inventory (STAXI, Anger-In & Anger-Out)

Everyone feels angry or furious from time to time, but people differ in the ways they react when they get angry. Below are reactions people may have when they feel angry or furious. How often do YOU react or behave in these ways WHEN YOU ARE ANGRY OR FURIOUS?

When angry or furious	Almost Never	Sometimes	Often	Always
1. I express my anger.....	1	2	3	4
2. I keep things in.....	1	2	3	4
3. I pout or sulk.....	1	2	3	4
4. I withdraw from people.....	1	2	3	4
5. I make sarcastic remarks to others.....	1	2	3	4
6. I do things like slam doors.....	1	2	3	4
7. I boil inside but I don't show it.....	1	2	3	4
8. I argue with others.....	1	2	3	4
9. I tend to hold grudges that I don't tell anyone about.....	1	2	3	4
10. I strike out at whatever infuriates me.....	1	2	3	4
11. I am secretly quite critical of others.....	1	2	3	4
12. I am angrier than I am willing to admit.....	1	2	3	4
13. I say nasty things.....	1	2	3	4
14. I am irritated a great deal more than people are aware of	1	2	3	4
15. I lose my temper	1	2	3	4
16. I am able to tell others how I feel.....	1	2	3	4

Dutch Eating Behaviour Questionnaire (DEBQ)

WHEN AND HOW DO YOU EAT?
Circle the number that shows how often the statement is true for you

	Never	Seldom	Some- times	Often	Very often
1. If you have put on weight, do you eat less than you usually do?.....	1	2	3	4	5
2. Do you try to eat less at mealtimes than you would like to eat?.....	1	2	3	4	5
3. How often do you refuse food or drink offered because you are concerned about your weight?.....	1	2	3	4	5
4. Do you watch exactly what you eat?.....	1	2	3	4	5
5. Do you deliberately eat foods that are slimming?.....	1	2	3	4	5
6. When you have eaten too much, do you eat less than usual the following days?.....	1	2	3	4	5
7. Do you deliberately eat less in order not to become heavier?.....	1	2	3	4	5
8. How often do you try not to eat between meals because you are watching your weight?.....	1	2	3	4	5
9. How often in the evening do you try not to eat because you are watching your weight?.....	1	2	3	4	5
10. Do you take into account your weight with what you eat?.....	1	2	3	4	5
11. Do you have the desire to eat when you are irritated?.....	1	2	3	4	5
12. Do you have a desire to eat when you have nothing to do?.....	1	2	3	4	5
13. Do you have a desire to eat when you are depressed or discouraged?.....	1	2	3	4	5
14. Do you have a desire to eat when you are feeling lonely?.....	1	2	3	4	5
15. Do you have a desire to eat when somebody lets you down?.....	1	2	3	4	5
16. Do you have a desire to eat when you are cross?.....	1	2	3	4	5

	Never	Seldom	Sometimes	Often	Very often
17. Do you have a desire to eat when you are approaching something unpleasant to happen?.....	1	2	3	4	5
18. Do you have a desire to eat when you are anxious, worried or tense?.....	1	2	3	4	5
19. Do you have a desire to eat when things are going against you or when things have gone wrong?.....	1	2	3	4	5
20. Do you have a desire to eat when you are frightened?.....	1	2	3	4	5
21. Do you have a desire to eat when you are disappointed?.....	1	2	3	4	5
22. Do you have a desire to eat when you are emotionally upset?.....	1	2	3	4	5
23. Do you have a desire to eat when you are bored or restless?.....	1	2	3	4	5
24. If food tastes good to you, do you eat more than usual?.....	1	2	3	4	5
25. If food smells and looks good, do you eat more than usual?.....	1	2	3	4	5
26. If you see or smell something delicious, do you have the desire to eat it?.....	1	2	3	4	5
27. If you have something delicious to eat, do you eat it straight away?.....	1	2	3	4	5
28. If you walk past the bakery, do you have a desire to buy something delicious?.....	1	2	3	4	5
29. If you walk past a snack bar or a café, do you have a desire to buy something delicious?.....	1	2	3	4	5
30. If you see others eating, do you also have a desire to eat?.....	1	2	3	4	5
31. Can you resist eating delicious foods?.....	1	2	3	4	5
32. Do you eat more than usual when you see others eating?.....	1	2	3	4	5
33. When preparing a meal, are you inclined to eat something?.....	1	2	3	4	5