

**PERCEIVED FAMILY FUNCTIONING AND DISORDERED
EATING BEHAVIOURS AMONG ADOLESCENTS:
PERFECTIONISM AND EXTERNALIZED SELF-PERCEPTION AS
MODERATING VARIABLES**

by

Marisa A. Murray

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

Master of Arts

in

Psychology

Carleton University
Ottawa, Canada

© 2011 Marisa A. Murray



Library and Archives
Canada

Published Heritage
Branch

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque et
Archives Canada

Direction du
Patrimoine de l'édition

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file *Votre référence*
ISBN: 978-0-494-83093-2
Our file *Notre référence*
ISBN: 978-0-494-83093-2

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.


Canada

Abstract

The objective of the study was to examine the influence of perceived family functioning on disordered eating behaviours in a community-based sample of adolescents. Also examined was whether perfectionism and externalized self-perception moderated this relationship. Participants included 2518 adolescents ($M_{age} = 14.04$, $SD = 1.65$) from high schools and middle schools in the Ottawa area. Archival data from validated, self-report questionnaires related to family functioning, disordered eating behaviours, individual difference factors and socio-demographic variables were analyzed in the study. Results from the study indicated that perceived family functioning was predictive of restrained eating for males and predictive of emotional eating for females. Perfectionism and externalized self-perception emerged as significant predictors of disordered eating behaviours for male and female adolescents. For females only, perfectionism and externalized self-perception moderated the relationship between perceived family functioning and emotional eating. These findings have important implications for the design of prevention and treatment programs.

Acknowledgements

I wish to express my deepest gratitude and indebtedness to the following individuals, whose unwavering support provided me the confidence and determination to achieve a monumental goal. To my esteemed advisor, Dr. Bowker, a profound thank you for providing me the degree of support, guidance, mentorship, and the vitally important patience that were so essential to assuring the success of this endeavor. Dr. Bowker, in the most positive sense, you have left an indelible impression on my life and in years to come, I know I will credit you repeatedly for the successes I attain, the milestones I hope to reach. An enormous thank you, as well, to my co-advisor, Dr. Henderson, whose support, constructive feedback and words of encouragement provided me a sense of calm in the midst of many storms. To the REAL team, sincere thanks, for without your commitment to research, this study would not have been possible. To my committee members, for your boundless generosity, for the giving of your time and providing valuable insights as the project took shape, my sincerest thanks. To my labmates and friends, you shared with me your optimism, encouragement, and most importantly, your humour and for this, I owe you a debt of gratitude impossible to repay. All of you have contributed greatly in making my years at Carleton some of the most enjoyable, meaningful, and productive years of my life. A big thank you to Heather Hagan-Bergstrom and Etelle Bourassa for treating me with a degree of patience that was above and beyond the call of duty, for answering my ceaseless questions, for assisting me with numerous administrative tasks, and always with a smile and a sense of care and concern. Thank you to the many students who participated in this research and the volunteers who gave of their time and energy to assist in data collection and data entry. Last but not least, my deep and enduring gratitude to two people who have endured me the longest, my parents. You instilled in me a strong work ethic and taught me the value of persistence and determination. An immeasurable thank you for your unconditional love and support.

Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
Table of Contents.....	iv
List of Tables.....	viii
List of Figures.....	x
List of Appendices.....	xi
Perceived family functioning and disordered eating behaviours among adolescents:	
Perfectionism and externalized self-perception as moderating variables.....	1
Statement of the Problem.....	1
Eating Disorder Risk.....	2
Classification of Eating Disorders.....	6
Anorexia Nervosa.....	6
Bulimia Nervosa.....	7
Eating Disorders Not Otherwise Specified.....	7
Theories of Family Functioning and Disordered Eating Behaviours.....	10
The Family.....	10
The Circumplex Model of Marital and Family Systems.....	10
Perceived Family Functioning and Eating Pathology.....	13
Family Functioning & Restrained Eating.....	13
Family Functioning & Emotional Eating.....	16
Family Functioning & Disordered Eating Behaviours.....	20
Potential Moderating Variables.....	23
Perfectionism & Disordered Eating Behaviours.....	23

Externalized Self-Perception & Disordered Eating Behaviours.....	26
Summary.....	27
The Present Study.....	28
Method.....	33
Participants.....	33
Procedure and Design.....	34
Measures.....	35
Demographics.....	35
BMI.....	35
Disordered Eating Behaviours.....	35
Perceived Family Adaptability and Cohesion.....	36
Perfectionism.....	37
Externalized Self-Perception.....	38
Ethics.....	39
Results.....	40
Preliminary Analyses.....	40
Missing Data.....	40
Testing of Assumptions.....	41
Potential Control Variables.....	41
Descriptive Statistics.....	42
Categorization of Family Functioning Variables.....	45
Descriptive Analyses by Family Group.....	47
Hierarchical Regression Analyses.....	50

Overview.....	50
Family Cohesion & Disordered Eating Behaviours.....	51
Perceived Family Enmeshment & Restrained Eating.....	51
Perceived Family Disengagement & Emotional Eating.....	56
Family Adaptability & Disordered Eating Behaviours.....	62
Perceived Family Rigidity & Restrained Eating.....	62
Perceived Family Rigidity & Emotional Eating.....	65
Summary of Results.....	70
Discussion.....	71
Gender Differences.....	73
Perceived Family Enmeshment & Restrained Eating.....	74
Perceived Family Rigidity & Emotional Eating.....	76
Family Functioning and Emotional Eating and Moderating Effects.....	77
Perceived Family Rigidity & Emotional Eating, Moderated by Perfectionism.....	77
Perceived Family Disengagement & Emotional Eating, Moderated by Perfectionism and Externalized Self-Perception.....	78
Significant Effects of Individual Difference Factors on Disordered Eating.....	80
Perfectionism.....	80
Externalized Self-Perception.....	81
Implications.....	82
Limitations & Future Research.....	84
Conclusion.....	87

References.....	89
Appendices.....	108

List of Tables

Table	Description	Page
1	Descriptive Statistics for the Independent, Dependent, and Moderating Variables for Females and Males	43
2	Correlations Between Restrained Eating, Emotional Eating, Perfectionism and Externalized Self-Perception for Females and Males.....	44
3	Mean Family Cohesion Scores by Gender.....	46
4	Mean Family Adaptability Scores by Gender.....	46
5	Hierarchical Regression Analyses of Perceived Family Enmeshment On Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.....	53
6	Hierarchical Regression Analyses of Perceived Family Enmeshment on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.....	54
7	Hierarchical Regression Analyses of Perceived Family Disengagement on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.....	58
8	Hierarchical Regression Analyses of Perceived Family Disengagement on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.....	61
9	Hierarchical Regression Analyses of Perceived Family Rigidity on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.....	63

10	Hierarchical Regression Analyses of Perceived Family Rigidity on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.....	64
11	Hierarchical Regression Analyses of Perceived Family Rigidity on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.....	66
12	Hierarchical Regression Analyses of Perceived Family Rigidity on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.....	69

List of Figures

Figure	Description	Page
1	Perceived family functioning predicting disordered eating behaviours moderated by perfectionism and externalized self-perception.....	32
2	The relation between perceived family cohesion and emotional eating as a function of perfectionism for female adolescents.....	59
3	The relation between perceived family cohesion and emotional eating as a function of externalized self-perception for female adolescents.....	59
4	The relation between perceived family adaptability and emotional eating as a function of perfectionism for female adolescents.....	67

List of Appendices

Appendix	Description	Page
A	Consent and Assent Forms.....	108
B	Thank You Letter.....	115
C	Demographics Questionnaire.....	116
D	Dutch Eating Behaviour Questionnaire.....	117
E	Family Adaptability and Cohesion Scale.....	120
F	McKnight Risk-Factor Survey (Perfectionism Subscale).....	122
G	Silencing the Self Scale for Adolescents.....	123

Perceived family functioning and disordered eating behaviours among adolescents:

Perfectionism and externalized self-perception as moderating variables

Statement of the Problem

Eating Disorders (EDs), which are characterized by intense body image disturbances, extreme control over food consumption and/or dangerous behaviours to lose weight (American Psychiatric Association [APA], 2000; Striegel-Moore & Bulik, 2007), are speculated to have increased in recent decades, with as many as 10 million females and one million males in the United States struggling with an ED (National Eating Disorders Association, 2011). Additionally, a recent analysis conducted by the Agency for Healthcare Research and Quality (AHRQ; 2009) indicated that from 1999 to 2006, the number of American children and preadolescents under the age of 12 who were being hospitalized for an ED increased by 119%. These rates are quite alarming as EDs are associated with emotional distress and functional impairment (Reijonen, Pratt, Patel, & Greydanus, 2003; Steiner & Lock, 1998; Strober, Freeman, & Morrell, 1997) as well as a variety of serious and even life-threatening medical consequences due to starvation (i.e., dehydration; osteoporosis; Fairburn & Harrison, 2003), bingeing (i.e., gallbladder disease; high blood pressure; U.S. Department of Health and Human Services, 2008) and purging (i.e., esophagitis; dental problems; Rome & Ammerman, 2003). EDs also result in the highest mortality rate of all psychiatric illnesses (Sullivan, 1995). Based on these findings and on additional research which highlights the importance of examining risk factors associated with the development of an ED (Day et al., 2011; Striegel-Moore & Bulik, 2007), the main focus of the present study was to examine perceived family functioning as a risk factor for disordered eating among adolescents. Also considered was whether individual difference factors (i.e.,

perfectionism and externalized-self perception) interact with perceived family functioning to increase an adolescent's risk for engaging in disordered eating behaviours.

Eating Disorder Risk

Although the exact underlying cause of EDs has been a topic of debate and investigation for many years, contemporary researchers and clinicians tend to view the etiology of EDs as being multidimensional, comprised of a combination of interacting psychological, sociocultural, individual, environmental, and biological factors (Mussell, Binford, & Fulkerson, 2000; Presnell, Bearman, & Stice, 2004; Streigel-Moore & Bulik, 2007; Tylka & Subich, 2004). It is also acknowledged that in order to successfully prevent or intervene in the development of an ED, it is necessary to properly identify and target risk factors in their early stages (Jacobi, Hayward, De Zwaan, Kraemer, & Agras, 2004; Phelps, Johnston, & Augustyniak, 1999). Accordingly, many studies have been focused on identifying risk factors that can lead to the onset of an ED (see Jacobi et al., 2004 and Streigel-Moore & Bulik, 2007 for a review).

Due to the numerous physical, psychological, and social changes that accompany adolescence, it comes as little surprise that EDs and related forms of eating pathology can be quite prevalent during this stage of development (Attie & Brooks-Gunn, 1989; Hoek & van Hoeken, 2003; Patton, Coffey, & Sawyer, 2003; Wang, Houshyar, & Prinstein, 2006). At the same time that there is a strong focus on appearance, the physical changes associated with puberty are often perceived by adolescents to contradict western society's narrow perception of what constitutes beauty (Killen et al., 1992; Rierdan & Koff, 1997). For example, weight gain during adolescence can result in feelings of body dissatisfaction, defined as negative, subjective evaluations about body weight and shape (Grogan, 1999), which is a potent risk factor in the development of an ED (Attie & Brooks-Gunn, 1989; Barker & Galambos, 2003; Phelps et al.,

1999; Rieder & Ruderman, 2001). While female adolescents are most susceptible to developing an ED, with a 10:1 female to male ratio (van Hoeken, Seidell, & Hoek, 2003), research has found that male adolescents are also at risk. For example, in a study including both males ($n = 297$) and females ($n = 306$) in grades seven to ten, McCabe and Vincent (2003) found that although girls tended to engage more frequently in dangerous weight loss behaviours, no significant gender differences existed between binge eating or binge-purge behaviours. As such, researchers have highlighted the importance of including males in studies related to ED risk and prevention (Chao et al., 2008; Muise, Stein, & Arbess, 2003; O'Dea & Abraham, 2000).

Within the risk factor research for the onset and maintenance of EDs, the family has been a topic of speculation and investigation throughout this clinical syndrome's history. Some researchers have identified a link between mothers and daughters who exhibit eating pathology, which can be theoretically explained by social learning theory (Bandura, 1977). This theory suggests that daughters mimic their mother's pathological eating behaviours (Cooley, Toray, Wang, & Valdez, 2008). While there does not appear to be a theory to explain the following risk factors, parental pressure to lose weight (McCabe & Ricciardelli, 2001; Thelen & Cormier, 1995) and familial weight teasing or negative comments regarding weight (Annus, Smith, Fischer, Hendricks, & Williams, 2007; Crowther, Kichler, Sherwood, & Kuhnert, 2002) have also been associated with the onset of EDs among female adolescents. As well, certain styles of family functioning have been linked to EDs (Benninghoven, Schneider, Strack, Reich, & Ceirpka, 2003; Johnson & Flach, 1985). Specifically, extreme levels (very high and very low) of *perceived family cohesion* - the emotional bonding among family members and *perceived family adaptability* - the degree to which families balance stability and change (Olson & Gorall, 2003)

have been associated with EDs among females (Minuchin, Rosman, & Baker, 1978; Vidovic, Jureša, Begovac, Mahnik, & Tocilj, 2005).

Individuals who exhibit individual difference characteristics, such as perfectionism, defined as excessively high personal expectations for elite achievement (Garner, Olmsted, & Polivy, 1983) are also considered to be at an increased risk for developing an ED. EDs can be driven by feelings of inadequacy in individuals who cannot face the prospect of failure in meeting the perceived demands that others place upon them. Thus, perfectionism can play a key role in making EDs manifest and creating a dependency with potentially dangerous consequences (Bulik et al., 2003; Castro-Fornieles et al., 2007). Further, perfectionism has been found to interact with other known risk factors related to EDs to increase the extent to which individuals engaged in eating pathology (Brannan & Petrie, 2008).

Externalized self-perception (Jack & Dill, 1992), defined as the degree to which individuals judge themselves according to external standards (i.e., the opinions of others) and weigh the perceptions and feelings of others more strongly than their own with respect to their self-worth has also been linked to both ED cognitions (Frank & Thomas, 2003; Jack & Dill, 1992) and behaviours (Lieberman, Gauvin, Bukowski, & White, 2001; Norwood et al., 2011). However, there do not appear to be any studies that have examined the degree to which externalized self-perception interacts with other risk factors to predict EDs.

Demographic variables which are consistently associated with EDs include: gender, age, higher body mass index (BMI), ethnicity and socioeconomic status. Although EDs were once considered to primarily affect Caucasian females from higher socioeconomic backgrounds (Fairburn & Cooper, 1984; Pyle, Mitchell, & Eckert, 1981), findings from more recent studies reveal that the epidemiology of EDs has changed. Specifically, there has been an upward trend

in EDs among males, children, individuals from lower socioeconomic backgrounds and minority populations in North America and in countries where EDs were once non-existent (AHRQ; 2009; Felker & Stivers, 1994; French et al., 1997; Hsu, 1996; Joiner & Kashubeck, 1996; Phelps & Bajorek, 1991; Rosen, 2003; White & Grilo, 2005).

Although a plethora of research has been devoted to examining risk factors associated with EDs, there appears to be a limited amount of research investigating how perceived family functioning interacts with other known risk factors in the development of EDs. Accordingly, little is known about how certain individual difference factors influence the relationship between perceived family functioning and EDs. To extend research that has linked family functioning to EDs, the present study will contribute to the literature by examining whether perfectionism and externalized self-perception interact with perceived family functioning to predict eating pathology among adolescents, while controlling for socio-demographic variables that have been linked to EDs, such as gender, age, BMI, ethnicity, and socioeconomic status. In the current study, family functioning will be composed of two characteristics: a) perceived family cohesion and b) perceived family adaptability. Eating pathology will focus on a.) Restrained eating (inhibiting dietary intake to maintain a low body weight; Herman & Mack, 1975) and b.) Emotional eating (overeating or bingeing due to negative emotional states; Van Strien, Frijters, Bergers, & Defares, 1986) as they are symptomatic of clinical EDs (Wardle, 1987).

In the sections that follow, I will review literature on 1.) the classification of eating disorders, 2.) theories of family functioning and eating behaviours 3.) past research which has examined the relationship between perceived family functioning and eating pathology and 4.) potential moderating variables (i.e., externalized self-perception and perfectionism) of interest to the current study. It is important to stress that the goal of this research is not to “blame” parents

for the onset of a child's eating pathology, but conversely to understand how perceived family functioning and individual difference variables are associated with the development of eating pathology. Greater awareness and understanding of these risk factors may aid in developing more effective intervention and treatment programs.

Classification of Eating Disorders

The Diagnostic and Statistical Manual of Mental Disorders (4th edition, text revision, APA, 2000) presents three types of EDs including: anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified. Although there are shared features related to EDs, (i.e. preoccupation with food) there are also distinguishing characteristics in EDs, which will be discussed below. It is also important to note that EDs are most often viewed as spectrum disorders, indicating that these disorders fall on a continuum of severity and can change over time (Stice, Killen, Hayward, & Taylor, 1998).

Anorexia Nervosa. Anorexia Nervosa (AN) is characterized by the refusal to maintain an objectively normal weight (< 85% of expected weight for one's age and height or a body mass index < 17.5 kg/m²), a preoccupation with body weight, an extreme fear of gaining weight, and denial of exhibiting low body weight (APA, 2000). Additionally, for a diagnosis of AN to be made, females must have missed three consecutive menstrual cycles. Individuals most affected by AN are female adolescents between the age of 15-19, with 40% of all diagnoses being made in this age group (Hoek & van Hoeken, 2003). Treatment of AN is complex, and in fact, success depends on a multidisciplinary approach. The combined effort of mental health professionals, physicians, nutritionists and family members is essential in combating this destructive behaviour (Steiner & Lock, 1998). Most alarmingly, an estimated 15% of adolescents who struggle with AN and who do not seek treatment will face death (Wang & Brownell, 2005).

AN is characterized by two distinctive types (APA, 2000). The Restricting type (AN-R) is characterized by caloric restriction as well as excessive exercise, but does not include regular bingeing and purging behaviours. The Binge-Eating/Purging type (AN-BP) includes frequent bingeing and purging behaviours. In the current study, AN will refer to the former as the distinctions between symptomatology for AN-R and bulimia nervosa are more explicit.

Bulimia Nervosa. Bulimia Nervosa (BN) is categorized by a repetitive process whereby an individual will eat an abnormally large portion of food (binge) and then expel the food from his or her system (purge) by a means of self-induced vomiting, compulsive physical exercise, the misuse of diuretics, laxatives and/or enemas, or by a refusal to eat for long periods of time (fasting). BN is patterned behaviour occurring at least twice per week over the course of a minimum of three months. Individuals with BN often dwell on body shape and weight in assessing their appearance, but tend to actually fall into a normal weight range (APA, 2000). Young people in mid to late adolescence are most affected by BN (Currin, Schmidt, Treasure, & Jick, 2005). The American Psychiatric Association (2000) estimates rates of BN to be between 1-3% among females and approximately one tenth that among males.

BN is also characterized by two distinctive types, purging type (bingeing accompanied by self-induced vomiting or the misuse of diuretics, laxatives, and/or enemas) and non-purging type (bingeing accompanied by behaviours such as compulsive physical exercise or fasting, in the absence of regularly engaging in self-induced vomiting and misusing diuretics, laxatives, and/or enemas). In the current study, BN will refer to the former.

Eating Disorders Not Otherwise Specified. Eating disorders not otherwise specified (EDNOS), which are sometimes referred to as 'partial syndromes' are defined as disorders that do not meet the full clinical criteria for AN or BN (APA, 2000). For example, one can meet the

criteria for AN, but have a normal body weight for his or her height. As another example, one may still meet the criteria for BN, even though binge eating and the aforementioned compensatory behaviour occur less than twice per week or for less than three months. An EDNOS diagnosis can also be made if one exhibits a normal body weight, but engages in dangerous compensatory behaviour on a regular basis, even after eating small portions of food. Studies show that the majority of individuals who are diagnosed with an ED do not meet the full criteria for an AN or BN, and therefore, EDNOS is the most common ED diagnosis made (Fairburn & Bohn, 2005; Keel, Haedt, & Edler, 2005). EDNOS prevalence rates are estimated to be as high as 14% when it is more broadly defined (Chamay-Weber, Narring, & Michaud, 2005). A study conducted by Fairburn and Bohn (2005), revealed that compared to diagnoses of BN (25.5%) and AN (14.5%), EDNOS accounted for 60% of the ED diagnoses made.

Binge eating disorder (BED) is the most commonly studied EDNOS. In BED, individuals engage in binges similar or even identical to those involved in BN; however, the key difference in BED is that binges are not preceded by abnormal compensatory behaviours (APA, 2000; Berkman, Lohr, & Bulik, 2007; Ramacciotti et al., 2008). As a result, BED is almost always accompanied by increased weight gain and obesity (Ramacciotti et al., 2008). Individuals who meet criteria for BED binge eat at least two times per week over the course of six months and do not have a diagnosis of AN or BN. Individuals also experience feelings of distress during and/or following the binge episodes (APA, 2000).

Although prevalence rates of the three EDs outlined by the DSM-IV-TR (APA, 2000) may appear to be low, this is due to the underestimation of EDs as a result of: a) the secretive nature of the disorder and b) the many individuals who exhibit only partial symptoms of an ED. With respect to the latter reason, researchers have highlighted the importance of examining the

full spectrum of eating pathology and not only full syndrome EDs (Field et al., 1999; Shisslak, Crago, & Estes, 1995; Whitaker, 1992). Accordingly, the current study is interested in disordered eating behaviours, which are defined by a broad range of psychological and behavioural characteristics that involve extreme and unhealthy eating behaviours (Beals, 2004; French, Perry, Leon, & Fulkerson, 1995) and are fairly common among adolescents (Forman-Hoffman, 2004). A study by Felker and Stivers (1994) identified as many as 32% of female and 23% of male adolescents in grades 10-12 to be at risk for developing an ED. In a more recent study including over 80,000 adolescents, Croll, Neumark-Sztainer, Story, and Ireland (2002) found that 56% of females and 28% of males in the ninth grade reported engaging in disordered eating behaviours. These rates were even higher among 12th grade students with 57% of females and 31% of males engaging in disordered eating behaviours. In another large-scale study including relatively younger individuals between the age of nine to fourteen, researchers found that approximately 13% of girls and 7% of boys exhibited some form of disordered eating behaviour (Neumark-Sztainer & Hannan, 2000), which according to researchers (Croll et al., 2002; Stice, 1999), places them at risk for developing a future ED, severe problems related to food and/or body dissatisfaction.

For purposes of clarity in the following sections, the term *eating disorders* (EDs) will refer exclusively to the diagnostic disorders listed by the DSM IV-TR (i.e., AN, BN, BED, EDNOS; APA, 2000). The term *disordered eating behaviours* will include subclinical levels of ED, which will be categorized as: Restrained eating and Emotional eating. *Eating pathology* will refer to both EDs and disordered eating behaviours.

Theories of Family Functioning and Disordered Eating Behaviours

The Family. Researchers have recognized the importance of the family in the etiology of eating pathology and have therefore explored, among other familial influences, family functioning as a risk factor for eating pathology. Although causality cannot be inferred, results from several studies using a variety of different measures, have demonstrated that individuals who exhibit eating pathology perceive family functioning as being somewhat dysfunctional (Humphrey, 1989; Johnson & Flach, 1985; Kog & Vandereycken, 1989; Ordman & Kirschenbaum, 1986; Stober, 1981). This section will provide a review of the theories and literature pertaining to perceived family functioning, *restrained eating* (i.e., AN) and *emotional eating* (i.e., BN and BED) among females. Subsequent sections will include literature on perceived family functioning and disordered eating behaviours among males and females as well as adolescents.

The Circumplex Model of Marital and Family Systems. *The Circumplex Model of Marital and Family Systems* (Olson, Sprenkle, & Russell, 1979; Olson, Russell, & Sprenkle, 1983) includes three elements of family functioning styles, family cohesion, adaptability, and communication. Since family cohesion and adaptability have been more strongly related to EDs in past research (Humphrey, 1989; Kagan & Squires, 1985; Kog & Vandereycken, 1989; Minuchin et al., 1978), the current study will focus on these two elements. Family cohesion is defined as the emotional bonding among family members and the amount of autonomy that a family member encounters within the family system (Olson et al., 1979). Several concepts that can be used to assess family cohesion include: emotional bonding, unspoken boundaries, the use of time and space, the impact of friends on the family, how decision-making is arrived at, and familial interests. The well-being of family unity depends on how well “togetherness” balances

and harmonizes with required “separateness” (Olson et al., 1979). Family cohesion is identified at different levels with low level cohesion (family disengagement) at one extreme and very high level unity (family enmeshment) at the other. Families with a healthy balance of cohesion (i.e., mid-range levels) allow for a balance between individuality and being a team member. Family members can be separated without being disengaged, retaining a strong, if slightly diminished emotional attachment to other members. Time spent apart, given that there is strong family unity, in no way negatively impacts those occasions when family decision-making is required or the support of the entire family is called for. Positive relationships are defined by emotional bonding, trust, and loyalty (Olson & Gorall, 2003).

Family cohesion is recommended to help individuals achieve a closer association with their families and a willingness to confide in them when issues concerning adolescence arise (Franko, Thompson, Affenito, Barton, & Striegel- Moore, 2008). However, Olson et al. (1979) identify the extremes of family cohesion as serious problems. Overly connected families, which are often referred to as enmeshed families, are in virtual agreement on all matters pertaining to family, allowing for no difference and negligible individuality (Carlson, Sperry, & Lewis, 1997; Olson & Gorall, 2003). The pattern of enmeshment can negate efforts towards a child’s attaining independence (Barber, Olsen, & Shagle, 1994; Humphrey, 1989) and has been linked to *restrained eating* (Wallin & Hansson, 1999; Tachi, 1999). At the opposite extreme, disconnected families, or most often referred to as disengaged families, seldom if ever have agreement on matters pertinent to its members, which undermines the concept of family. Disengaged families exhibit limited attachment and commitment to other members (Olson & Gorall, 2003), and have been found to be characteristic of individuals who struggle with *emotional eating* (Hodges, Cochrane, & Brewerton, 1998; Johnson & Flach, 1985; Tachi, 1999).

Family adaptability, sometimes referred to as family flexibility encompasses change in leadership roles, changes in the ways family members relate to one another and changes in the rules that govern the ways that family members interact (Olson & Gorall, 2003). Adaptability is a key area of study because it addresses the degree of balance between stability and change. As with family cohesion, adaptability can be viewed as being curvilinear with very low levels of family functioning (rigid) at one extreme and very high levels of family functioning (chaotic) at the other.

It is asserted that the centrist positions (i.e., mid-range) on the adaptability scale, rather than those of the two extremes, offer the best chances for healthy family (and marital) functioning. Structured relationships are seen to offer more equitability to all family members, allowing for negotiations, in which children are to some extent, participants. Rules remain constant for the most part and are enforceable. Adaptability suggests and delivers equality in most facets of family life. Role sharing and adaptability are positive means of meeting challenges (Olson & Gorall, 2003). Research indicates that parent-adolescent relationships that are shown to demonstrate stability in the area of autonomy are the healthiest for adolescent adjustment (Kobak, Cole, Ferenz-Gillies, Flemming, & Gamble, 1993).

Unbalanced families tend to be caught in the margins of rigidity or chaos. A rigid relationship (i.e., low adaptability), which is often evident in families of individuals who struggle with *restrained* and *emotional eating* (Humphrey, 1989; Johnson & Flach, 1985; Strober, 1981), allows for limited or no possibility of family negotiation. Rules are fixed and the roles of family members are unchanging. Conversely, a chaotic relationship is characterized by unpredictability of behaviour and a near absence of leadership and direction. Decision-making is erratic and confusing. Roles of family members are never clearly defined and are constantly passed on

among family members (Olson & Gorall, 2003). To date however, there is limited research linking chaotic forms of family functioning to eating pathology.

Perceived Family Functioning and Eating Pathology

Family Functioning & Restrained Eating. Minuchin et al. (1978) were the first to report on shared familial characteristics of females who had been diagnosed with AN. Specifically, they identified families of individuals who suffered from illnesses such as: AN, juvenile diabetes mellitus and bronchial asthma as *psychosomatic families* (Minuchin et al., 1978). While their theory is not without limitations (see Coyne & Anderson, 1989 for a review), Minuchin et al. (1978) defined the *psychosomatic family* as enmeshed, overprotective, rigid and subject to a lack of conflict resolution (Minuchin et al., 1978). Similar to the *Circumplex Model of Marital and Family Systems* (Olson et al., 1979; 1983), the enmeshed component is characterized by togetherness and strong communication and is purported to be a key reason why a sense of individuality is negligible while parents maintain an ease of control over their children. Specifically, children will defer to parents when situations call for voicing opinions. There is evidence, too, of a deceptively strong bond between family members which often results in a weakened perception of the differences marking those family members. *Psychosomatic families* also display an unusually strong sense of protectiveness towards one another as well as constant involvement in one another's lives. Family members are acutely attuned to one another's needs and concerns, particularly those which are problematic and might cause distress (overprotective). Similar to the adaptability component described in the *Circumplex Model of Marital and Family Systems* (Olson et al., 1979; 1983), *psychosomatic families* adhere to rigid behaviour standards, which will become a source of tension and conflict when parents and siblings try to deal with adolescents' rapidly evolving physical and mental development towards

maturation (rigidity). The rigidity characterizing the family forces the child to take a silent role instead of an expressive one, the latter which enables the child to develop a sense of individuality. Researchers have stressed the fact that, to increase the chance of maximum psychological development, parents must show flexibility in their parenting to answer to their adolescent's increasing requirements for independence (Kobak & Ferenz- Gillies, 1995).

Minuchin et al. (1978) suggest that lack of conflict resolution derives from the family being highly rigid, enmeshed, and overprotective. The identification of conflict resolution problems assumes two forms. Families either avoid conflict altogether, therefore bypassing the exercise of conflict resolution or families are in a perpetual state of conflict. Families that include a child with AN often exhibit the former (Kog & Vandereycken, 1989; Minuchin et al., 1978). Avoidance is most often achieved by failing to stay on a particular topic or by diffusing an otherwise serious situation with humour and other types of incompatible response. It should be noted that while the *psychosomatic family* (Minuchin et al., 1978) has never been "proven" typical of families of individuals who struggle with an ED (Kagan & Squires, 1985), as discussed in the next sections, the literature continues to identify dysfunctional patterns of family functioning as a risk factor for eating pathology.

Taking into account the perspectives of other family members, Humphrey (1989) studied parent-child relationships among 74 families that included a teenage daughter who struggled with an ED, and her biological parents. Families took part in a 30-minute lab session in which they were assigned to role play on the topic of their daughter being separated from the family. The families were videotaped for 10 minutes during the discussion. To ensure objectivity in measuring family interaction, Humphrey (1989) used an observational coding system *Benjamin's Structural Analysis of Social Behaviour* (SASB; Benjamin, 1974) to differentiate normal from

dysfunctional family interactions. In support of the *conflict avoidance* component of the *psychosomatic family* (Minuchin et al., 1978), daughters with AN were recognized as being the most accommodating with their parents. Results also indicated that, compared to the control participants and those who struggled with BN, parents of daughters who had AN sent mixed messages. That is, sometimes they offered care and consoling while at other times were dismissive and neglectful towards their daughter, creating unhealthy inconsistency in the relationship.

In accordance with the enmeshment and rigidity components of *Circumplex Model of Marital and Family Systems* (Olson et al., 1979; 1983), Humphrey (1989) suggests that extreme levels of parental caring seem to weaken the daughter's attempts to individuate, which reinforces her reliance on her parents. Parents also dismiss her attempts at self-expression as well as her need for healthy emotional development. Humphrey (1989) explains that the daughter reflects parents' contradicting messages with her uncertainty about separating. It appears that the daughter cannot reveal her true thoughts and feelings without giving in to her parents' standards and views (Humphrey, 1989).

Research shows that AN usually becomes evident when individuals are confronted with new life experiences and demands. Bruch (1982) explains that individuals who struggle with AN are not adequately prepared to assert themselves outside the confines of family. Additionally, they fail to connect positively with their peers whose behaviour is rapidly changing. Parents of individuals with AN are most likely to voice disapproval of their behaviour. While individuals might be aware of their inadequacies in their development, they also experience a profound fear of descending into a state of incompetence. They lack a sense of personal autonomy and experience great weakness in decision-making. Personal frustration in

feeling trapped and an underdeveloped image of self emerge with puberty and adolescence. Thus, they equate achieving respect from others and being self-assured with being thin (Bruch, 1982).

In a more recent study, Vidovic et al. (2005) examined perceived family functioning among 76 female patients who had been diagnosed with an ED ($M_{age} = 20.21$) as well as 29 of their mothers. A group of 50 matched controls and 79 medical students were also included in the study. Researchers did not find significant differences between women who struggled with AN and the control groups on measures of perceived family cohesion and adaptability; however, consistent with other studies linking high levels of perceived family cohesion to restrained eating (Minuchin et al., 1978; Kog & Vandereycken, 1989), they did find that females with AN described their family environment as being more highly cohesive than women who had a diagnosis of BN (Vidovic et al., 2005). This is in support of research by Hodges et al. (1998) who found that individuals who struggled with AN reported higher levels of family cohesion relative to individuals who struggled with emotional forms of eating, such as BN and BED. This is also in line with findings from Wallin and Hansson's (1999) study which revealed that observers rated families that included an adolescent with AN as more enmeshed compared to the control families.

Family Functioning & Emotional Eating. Individuals who struggle with *emotional eating* (i.e., BN and BED) have also been found to perceive familial functioning as problematic. Johnson and Flach (1985) were the first to investigate the family environment among women who struggled with BN. Their study encompassed two groups of individuals who had similarities on demographic variables such as: age, marital status and level of education. The first group included 105 females who met clinical criteria for BN and the second group was

made up of 86 female undergraduate psychology students who did not meet clinical criteria for BN. Participants ranged from 18-28 years of age. Results from self-report measures indicated that, compared to women in the control group, those with BN described their families as showing significantly less support (i.e., family disengagement). Women with BN reported a significantly diminished level of independence from their families which is supported by the 38% of women in the bulimic group, compared to only 14% of the control group who were currently living with their families. Women with BN also reported feelings of rejection when attempting to express their emotions. Johnson and Flach (1985) suggest that both of these factors have to be reversed if a child is to develop a healthy sense of individuality. Further, their observations revealed that women with BN perceived their families as being in conflict, highlighted by anger, which is support for other research that has identified increased levels of perceived familial conflict among individuals who struggle with BN (Garner, Garfinkel, & O'Shaughnessy, 1985). BN symptoms were found to be most pronounced when the level of family dysfunction was greater (Johnson & Flach, 1985). This is supported by research that shows a relationship between weak bonding among family members and youth who engage in high-risk health enduring behaviours (Turner, Irwin, Tschann, & Millstein, 1993).

Subsequent studies have supported the association between low levels of perceived family functioning and the onset of BN. For example, a comparative study by Ordman and Kirschenbaum (1986), including a sample of 25 women who had been diagnosed with BN and a control group of women enrolled in an introductory psychology class, found that females with BN had significantly lower scores on family cohesion, compared to controls. Women with BN also revealed a diminished sense of independence when being apart from their families. Researchers suggest that while a lack of overprotectiveness and overinvolvement of parents can

be positive, daughters who struggle with BN are emotionally weakened and uncertain of themselves because of the hostility and disagreements which they have experienced within their families (Ordman & Kirschenbaum, 1986).

In the aforementioned study conducted by Humphrey (1989), examining 74 families of daughters who struggled with an ED, findings revealed that daughters who had been diagnosed with BN together with their mothers, exhibited increased levels of familial anger and hostility. This was made clear by the increased displays of mocking and responsibility-avoiding behaviours indulged in by family members, a finding that supports prior research (Garner et al., 1985; Johnson & Flach, 1985). Fathers of daughters with BN also showed a mix of “pseudounderstanding” and dominance over their daughters in terms of voicing understanding of and giving guidance to their conflicted daughters. The daughters, in turn, responded to this attention with weak attempts at independent conduct accompanied by moodiness and passing blame back to their fathers. Humphrey (1989) suggests that while the daughter wishes to assert her independence, these efforts are compromised by a stronger urge to yield to adopting the subordinate or weaker role. In the absence of positive interaction that can create self-confidence and mutual understanding for daughters with BN and their families, daughters will often turn to unproductive, usually harmful alternatives, most commonly food (Humphrey & Stern, 1988). It has been suggested by researchers that these individuals use food as a self-soothing tool while purging behaviours are viewed as a means of expelling negative affect in the most expeditious form (Humphrey, 1989; Ordman & Kirschenbaum, 1986).

Hodges et al. (1998) were the first to study perceived family functioning among individuals who struggled with BED. Their study included a clinical sample of 131 patients who had been diagnosed with an ED and two control groups. In support of previous research linking

emotional eating with decreased levels of perceived family cohesion (Johnson & Flach, 1985; Kog & Vandereycken, 1989; Ordman & Kirschenbaum, 1986), researchers found the BED group reported significantly lower levels of perceived family cohesion than individuals in the other ED groups. Also in support of previous research is the finding that those who engaged in *emotional eating* (i.e., BN and BED) reported increased levels of family conflict (Garner et al., 1985; Johnson & Flach, 1985) and rated their families as significantly less expressive (Humphrey, 1989; Johnson & Flach, 1985), compared to the other ED groups.

In summary, while families that include a child who struggles with eating pathology may not conform to Minuchin et al.'s (1978) "*psychosomatic family*", based on a review of the literature, there do appear to be common themes among females who struggle with *restrained eating* (i.e., AN) versus *emotional eating* (i.e., BN and BED). In support of Minuchin et al.'s (1978) research that links *psychosomatic families* with AN, subsequent research has found that families of females who struggle with *restrained eating* may exhibit one or more of the following characteristics: family enmeshment (i.e., high cohesion; Humphrey, 1989; Strober, 1981; Wallin & Hansson, 1999), family rigidity (i.e., low adaptability; Humphrey, 1989), high levels of conflict avoidance (Kog & Vandereycken, 1989), overprotectiveness or excessive nurturance (Bruch, 1982; Humphrey, 1989).

By contrast, females who struggle with *emotional eating* appear to perceive their families as disengaged (i.e., low in cohesion; Hodges et al., 1998; Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Strober, 1981), rigid (i.e., low in adaptability; Humphrey, 1989; Vidovic et al., 2005) and high in conflict (Garner et al., 1985; Hodges et al., 1998; Humphrey, 1989; Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Strober, 1981). In the current study, perceived family functioning (i.e., family cohesion and adaptability) will be examined as a

predictor of two specific types of disordered eating behaviours: restrained eating and emotional eating.

The relationship between family functioning and EDs has predominantly been examined using clinical samples. Thus, due to the low number of males who meet clinical criteria for EDs (APA, 2000), a limited amount of research has examined family functioning and disordered eating among both males and females. Since the present study examined perceived family functioning and disordered eating behaviours in a community sample of male and female adolescents, the following section will include findings from studies which have examined family functioning and eating pathology in non-clinical samples.

Family Functioning & Disordered Eating Behaviours. Several studies have implicated perceived family functioning with disordered eating behaviours in non-clinical samples of college age females (Holston & Cashwell, 2000; Lundholm & Waters, 1991). However, since specific disordered eating behaviours (i.e., restrained and emotional eating) were not examined separately in these studies, concrete conclusions with respect to family functioning and symptomatology of distinct disordered eating behaviours cannot be inferred. As well, the exclusion of males has been addressed as a main limitation by researchers.

A study by Kagan and Squires (1985), however, did include a sample of 105 male and 195 female college students ($M_{age} = 21.12$ years). Their study demonstrated that, *emotional eating*, which was referred to as “compulsive eating” was associated with decreased levels of perceived family cohesion. This finding supports results from clinical studies that have connected low levels of perceived family cohesion to BN among females (Johnson & Flach, 1985; Kog & Vandereycken, 1989). Specifically, low levels of perceived family cohesion were predictive of compulsive eating among females, whereas, low levels of perceived family

cohesion and adaptability were predictive of compulsive eating among males. Since researchers were able to predict 18% of the variance in compulsive eating scores for males, they suggested that perhaps compulsive eating among males may have its origins within the family.

Specifically, these males may face problems or stressful situations in which they feel unsupported by their family. Kagan and Squires (1985) also suggest that because disordered eating behaviours are a less common expression of emotional disturbance among males, when they do occur, they may have more pronounced family problems as their source. The truth of this assertion may be borne out by the observations that show these males to be at significant emotional distance from their parents, while at the same time showing compulsive eating habits.

Findings from Kagan and Squires's (1985) study are important as very little research has examined perceived family functioning on disordered eating behaviours among both males and females and even less research has examined perceived family functioning as it relates to *emotional eating* in non-clinical samples. Accordingly, results from this study suggest that family functioning is not only associated with clinical diagnoses of ED, but also with disordered eating behaviours in non-clinical samples.

In a non-clinical sample of 393 male and female adolescents ($M_{age} = 16.3$), Felker and Stivers (1994) demonstrated that perceived family environment was also significantly associated with the risk of developing of an ED in the adolescent years. In support of past clinical research on individuals who struggle with *emotional eating* (Hodges et al., 1998; Johnson & Flach, 1985), male and female adolescents who were at risk of developing an ED reported lower levels of perceived family cohesion. Additional results from the study demonstrated that higher levels of conflict and lower levels of expressiveness and independence were significantly associated with the risk of developing an ED. These findings concur with previous research (Humphrey, 1989;

Ordman & Kirschenbaum, 1986; Strober, 1981). However, since EDs were not separated by typology, it is not clear whether individuals struggled with *restrained* or *emotional* forms of disordered eating.

Similar to results from clinical samples which have found low levels of perceived family cohesion to be associated with BN (Hodges et al., 1998; Kog & Vandereycken, 1989), results from a community-based sample of 45 male and 136 female adolescents demonstrated that females who were at risk for developing an ED reported lower levels of family cohesion and rated familial satisfaction less favorably than individuals in the comparison group (Leon, Fulkerson, Perry, & Dube, 1994). Similarly, results from a longitudinal study including 116 female adolescents revealed that positive familial interactions were characteristic of the low-risk trajectory group, relative to the high risk trajectory groups. Researchers suggest that positive familial relations may have had a buffering effect on the development of eating problems in the later years (Graber, Brooks-Gunn, Paikoff, & Warren, 1994).

Accordingly, it appears that research on family functioning and disordered eating behaviours in non-clinical samples including adolescents and college age males and females (Felker & Stivers, 1994; Graber et al., 1994; Kagan & Squires, 1985; Leon et al., 1994) are quite consistent with findings from clinical studies (Hodges et al., 1998; Johnson & Flach, 1985; Minuchin et al., 1978). However, it is not clear in non-clinical samples whether perceived family functioning is predictive of distinctive types of disordered eating behaviours. Therefore, the present study examined whether extreme forms of perceived family cohesion (i.e., enmeshment and disengagement) and adaptability (i.e., rigidity) are predictive of symptomatology associated with *restrained* versus *emotional* eating in a non-clinical adolescent sample.

There appears to be limited research which has examined individual difference factors that may interact with perceived family functioning to increase the risk of disordered eating behaviours among adolescents. Accordingly, the next section will review literature on individual difference factors (i.e., perfectionism and externalized self-perception) that were examined as potential moderating variables on the relationship between perceived family functioning and disordered eating behaviours.

Potential Moderating Variables

Perfectionism & Disordered Eating Behaviours. Perfectionism is identified as a common risk factor associated with EDs among youth (Castro et al., 2004; McVey, Pepler, Davis, Flett, & Abdolell, 2002; Nilsson, Sundbom, & Hägglöf, 2008). Empirical research has specifically connected perfectionism with traits (i.e., rigidity and meticulousness) often evident in individuals struggling with *restrained eating* (Bastiani, Rao, Weltzin, & Kaye, 1995) and *emotional eating* (Bardone-Cone, Weishuhn, & Boyd, 2009; Pratt, Telch, Labouvie, Wilson, & Agras, 2001). Perfectionism can be viewed as being multidimensional, composed of both adaptive and maladaptive components (Slaney & Ashby, 1996; Suddarth & Slaney, 2001). Adaptive aspects of perfectionism include setting high, yet attainable standards for oneself and working hard to attain one's goals. Conversely, maladaptive components of perfectionism include reaching for impossible standards of success, heightened self-criticism, excessive worry over making mistakes and persistent doubts regarding the worth of one's actions (Frost, Marten, Lahart, & Rosenblate, 1990; Rice & Ashby, 2007; Terry-Short, Owens, Slade, & Dewey, 1995). It is therefore, maladaptive forms of perfectionism that are most often associated with EDs (Pearson & Gleaves, 2006; Terry-Short et al., 1995). For example, individuals who struggle with EDs often describe a sense of defeat when they feel faced with the pressure of meeting others'

expectations, with what responsibility they have been given, and with the dreaded sense of failure they will experience if something goes awry. Unreasonable personal expectations, sometimes magnified by the high expectations of that individual's family, can lead that individual to use food as a means of dismissing personal deficits (Shafran, Cooper, & Fairburn, 2002; Vitousek & Hollon, 1990).

Research has found that the family can influence the development of perfectionism among children (Slaney & Ashby, 1996). Flett and colleagues (2002) argue that children raised by parents who worry frequently about being perfect are more susceptible to becoming perfectionistic themselves (Flett, Hewitt, Oliver, & Macdonald, 2002). Sorotzkin (1998) suggests that parents of perfectionistic children show signs of disappointment and negativity when the child makes an error, resulting in their reserving of approval for an occasion when the child excels. Consequently, the child becomes afraid of mistakes so he or she will avoid them at all costs. The child makes the connection between achieving perfection and the absence of the shameful feeling when parents are disappointed by the child's performance. Frost, Lahart, and Rosenblate (1991) suggest that mothers greatly influence children's perfectionism. Specifically, Frost and colleagues (1991) explain that children become perfectionistic due to observing their mother's behaviour and processing their mother's beliefs. Children also perceive a mother's perfectionistic tendencies in conjunction with her high expectations for them. Anything less than perfect will weaken the bond between mother and child. For example, a study by Cook and Kearney (2009) found that mothers' self-oriented perfectionism (i.e., rigorously examining one's behaviour and setting stringent goals for oneself; Hewitt & Flett, 1991) was positively associated with their sons' self-oriented perfectionism.

Individuals who struggle with eating pathology have been found to exhibit increased levels of perfectionism (Lundholm & Waters, 1991; Forbush, Heatherton, & Keel, 2007). In the view of their mothers, expectations are greater for girls who struggle with BN as opposed to those who do not (Sights & Richards, 1984). In a study of adolescents who exhibited chronic symptoms of BN, males actually scored higher on level of perfectionism than females (Joiner, Katz, & Heatherton, 2000).

With respect to *restrained eating*, females who prescribe to maladaptive perfectionistic standards have been found to express difficulty meeting the challenges of adolescence, which often includes adapting to a new body weight and shape (Tyrka, Waldron, Graber, & Brooks-Gunn, 2002). Mothers of individuals with AN have also been shown to be more oriented towards perfectionism compared to matched controls (Woodside et al., 2002). Minuchin et al. (1978) explain that, as a result of the *psychosomatic family's* high level of family cohesion (i.e., enmeshment) and overprotectiveness, a child will cultivate a deep and abiding need for perfection as a means of honoring the family.

In summary, there is an extensive amount of literature identifying perfectionism as an important risk factor in the development of eating pathology. Maladaptive perfectionism has also been found to strengthen the relationship between risk factors for eating pathology (i.e., the endorsement of ideal body images) and unhealthy eating attitudes (Dour & Theran, 2011). As such, the present study examined perfectionism as a potential moderating variable on the relationship between perceived family functioning and disordered eating behaviours among adolescents. It was of specific interest to identify whether increased levels of perfectionism strengthened this relationship. Understanding how perfectionism may strengthen the relationship

between perceived family functioning and disordered eating behaviours may contribute important information to the family and eating pathology literature.

Externalized Self-Perception & Disordered Eating Behaviours. Externalized self-perception (Jack & Dill, 1992) or the degree to which individuals judge themselves according to external standards and/or weigh the perceptions and feelings of others more strongly than their own with respect to their self-worth has also been associated with body image concerns and eating pathology (Lieberman et al., 2001; Norwood et al., 2011; Ross & Wade, 2004; Zaitsoff, Geller, & Srikaneswaran, 2002). Individuals who are in need of peer approval as a means of building identity may be more amenable to the expectations of their peers regarding body weight and physical appearance thus, the risk of pathological eating behaviour. Several studies have revealed that individuals who struggle with eating pathology report a higher level of dependent behaviour and the need for approval when interacting with others (Bruch, 1982; Katzman, & Wolchik, 1984). Striegel-Moore, Silberstein, and Rodin (1993) observed that women who had an ED seemed attuned to how others viewed them and what others expected of them regarding their physical appearance and that understanding, or connectedness, existed on a wide psychological level.

In a community based sample of 876 female adolescents, Lieberman et al. (2001) demonstrated that externalized self-perception was negatively correlated with body esteem and positively correlated with disordered eating behaviours. Similarly, in a clinical sample composed of 149 female adolescents, Buchholz et al. (2007) identified externalized self-perception as a unique predictor of body dissatisfaction and desire to be thin. Buchholz and colleagues (2007) explain that adolescent females struggling with EDs who consistently

scrutinize their thoughts and feelings in order to hold onto friendships are more likely to reveal that they experienced increased levels of body dissatisfaction and preoccupation with thinness.

While several studies have implicated externalized self-perception with eating pathology, there does not appear to be any research examining externalized self-perception and disordered eating behaviours in the familial literature. Accordingly, the current study was interested in how externalized self-perception may interact with maladaptive forms of perceived family functioning to predict disordered eating behaviours. Specifically, the study examined whether higher levels of externalized self-perception strengthened the relationship between maladaptive forms of perceived family functioning and disordered eating behaviours among adolescents. Such findings could have important implications for future programs aimed at eating pathology prevention and treatment.

Summary

As demonstrated by a review of the literature, EDs pose a serious public health issue in western society. Although the prevalence of EDs appears to be quite low, the number of individuals, namely adolescents who engage in disordered eating behaviours is much higher (Croll et al., 2002; Forman-Hoffman, 2004). Because eating pathology includes a multitude of biological, psychological, familial, individual and sociocultural factors, examining specific relationships of various risk factors may serve to expand the literature on the development of EDs and disordered eating behaviours.

Research has yielded an abundance of evidence linking patterns of perceived family functioning to EDs (e.g., Humphrey, 1989; Johnson & Flach, 1985; Vidovic et al., 2005). However, individual difference factors, such as perfectionism and externalized self-perception as potential moderating variables in the relationship between family functioning and disordered

eating behaviours have not been examined in the eating pathology literature. As well, the majority of studies regarding family functioning and EDs have used clinical samples of females (Humphrey, 1989; Johnson & Flach, 1985; Kog & Vandereycken, 1989; Ordman & Kirschenbaum, 1986; Strober, 1981), thus making it challenging to make inferences to adolescents in the general population who struggle with eating pathology. Moreover, only a few studies have examined perceived family functioning and disordered eating behaviours among males in university (Kagan & Squires, 1985) and adolescent (Felker & Stivers, 1994) samples. It also remains unclear whether different types of family functioning styles are predictive of symptomatology associated with type of disordered eating behaviours (i.e., restrained eating versus emotional eating). Such an investigation is important based on the notion that the type of intervention that families should receive may depend on their family functioning style (Wallin & Hansson, 1999).

The Present Study

Because researchers strongly recommend studying the etiology of eating pathology in non-clinical samples including both males and females (O'Dea & Abraham, 2000), and examining how different variables may interact with each other to heighten the risk of eating pathology (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001), the purpose of the present study was to fill evident gaps in the literature by setting two main objectives: 1.) to examine the influence of perceived family functioning (i.e., family adaptability and cohesion) on disordered eating behaviours in a community-based sample of male and female adolescents, and 2.) to investigate whether perfectionism and externalized self-perception interact with perceived family functioning to increase an adolescent's risk for engaging in disordered eating behaviours (see Figure 1). The present study tested whether these relationships were statistically significant after

controlling for potential socio-demographic variables that had a significant effect on disordered eating behaviours, such as: age, ethnicity, BMI, parental education as a proxy of SES and ethnicity. To meet the objectives of the present study, eight hypotheses were tested:

Hypothesis I. It was hypothesized that perceived *family enmeshment* (i.e., high family cohesion) would be predictive of higher levels of *restrained eating* among female adolescents in a non-clinical sample. This was based on Minuchin et al.'s (1978) enmeshment component of the *psychosomatic family* and on subsequent research that has found increased levels of perceived family cohesion and boundary problems among females in clinical samples who struggle with restrictive forms of eating (Humphrey, 1989; Kog & Vandereycken, 1989; Wallin & Hansson). The current study also examined whether perceived *family enmeshment* was predictive of *restrained eating* among male adolescents.

Hypothesis II. It was hypothesized that perceived *family disengagement* (i.e., low family cohesion) would be predictive of *emotional eating* among male and female adolescents. This was based on past research that has associated *family disengagement* with *emotional eating* in both clinical (Hodges et al., 1998; Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986) and non-clinical samples of college-age males and females (Felker & Stivers, 1994; Kagan & Squires, 1985).

Hypothesis III. It was expected that perceived *family rigidity* (i.e., low family adaptability) would be predictive of disordered eating behaviours among female adolescents. Specifically, based on past research which has associated family rigidity with eating pathology in clinical samples of women (Humphrey, 1989; Johnson & Flach, 1985; Minuchin et al., 1978; Strober, 1981) and a non-clinical sample including males (Kagan & Squires, 1985), it was

expected that *family rigidity* would be associated with *restrained* and *emotional eating* among female adolescents. This was also tested for male adolescents.

Hypothesis IV. It was hypothesized that perfectionism would moderate the relationship between *family enmeshment* and *restrained eating* among female adolescents. Specifically, it was expected that higher levels of perfectionism would *strengthen* the relationship between perceived family *enmeshment* and *restrained* eating. This was based on the aforementioned research linking family enmeshment to restrained eating among females as well as research associating perfectionism with restrained eating (Tyrka, et al., 2002). The current study also examined this hypothesis for male adolescents.

Hypothesis V. It was hypothesized that perfectionism would moderate the relationship between *family disengagement* and *emotional eating* among adolescents. Specifically, it was expected that higher levels of perfectionism would *strengthen* the relationship between perceived *family disengagement* and *emotional eating*. This hypothesis was based on the aforementioned research which has associated perfectionism and family disengagement with emotional eating for both males and females.

Hypothesis VI. It was hypothesized that perfectionism would moderate the relationship between *family rigidity* and disordered eating behaviours. Specifically, it was expected that higher levels of perfectionism would *strengthen* the relationship between perceived *family rigidity* and *restrained eating* as well as the relationship between perceived *family rigidity* and *emotional eating*. These predictions were based on the aforementioned research which has implicated perceived family rigidity and perfectionism with eating pathology among females. The current study also examined these predictions among male adolescents.

Hypothesis VII. It was hypothesized that externalized self-perception would moderate the relationship between perceived family cohesion (i.e., family enmeshment and family disengagement) and disordered eating behaviours (restrained and emotional eating) among female adolescents. Specifically, it was expected that higher levels of externalized self-perception would *strengthen* the relationship between perceived *family enmeshment* and *restrained eating* and the relationship between perceived *family disengagement* and *emotional eating*. These predictions were based on the aforementioned research which has associated maladaptive forms of family functioning and externalized self-perception (Lieberman et al., 2001; Norwood et al., 2011) with eating pathology for females. The present study also examined these models among male adolescents.

Hypothesis VIII. Similar to hypothesis VII, it was expected that externalized self-perception would moderate the relationship between perceived *family rigidity* and disordered eating behaviours among female adolescents. Specifically, it was expected that higher levels of externalized self-perception would *strengthen* the relationship between perceived *family rigidity* and *restrained eating* as well as the relationship between perceived *family rigidity* and *emotional eating*. However, externalized perception has not been studied very extensively in the eating pathology literature and to my knowledge, never in the family literature. This was the first known study to test the moderating effects of externalized self-perception in the relationship between perceived family functioning and disordered eating behaviours.

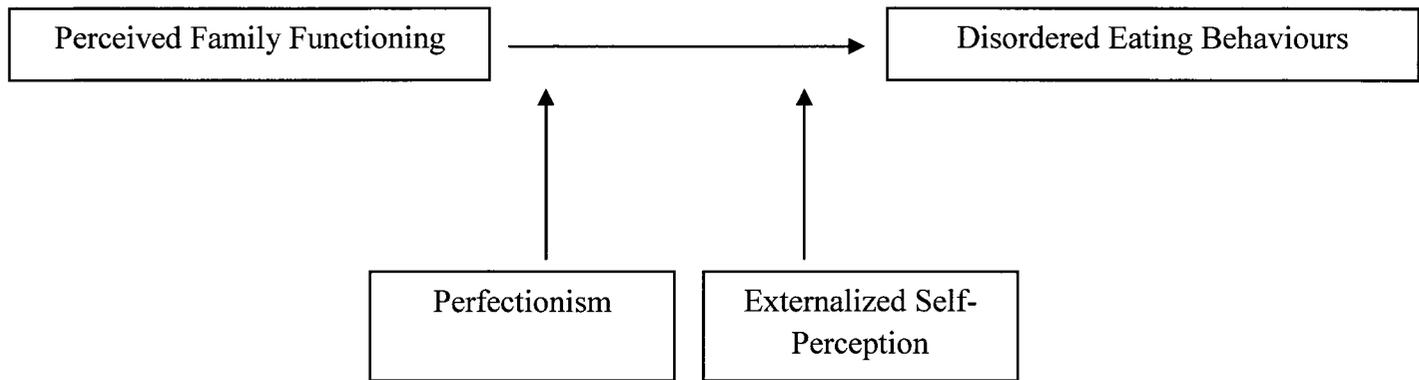


Figure 1. Perceived family functioning predicting disordered eating behaviours, moderated by perfectionism and externalized self-perception.

Method

The current study used archival data from a large cross-sectional and longitudinal study, the Research on Eating and Adolescent Lifestyle (REAL) study. The REAL study is an ongoing collaborative project between the University of Ottawa's Institute of Mental Health Research and the Children's Hospital of Eastern Ontario (CHEO). It is a study designed to predict biopsychosocial determinants of eating disorders and obesity in adolescents attending high schools and middle schools in the Ottawa, Ontario region.

Participants

Participants for the current study included 2518 adolescents ($M_{age} = 14.04$, $SD = 1.65$) from the Ottawa, Canada area who agreed to take part in the REAL study between the academic years of 2004-2010. Schools were selected from the rural, urban and suburban regions of Ottawa. Research staff recruited participants in the schools which had been approached about participation through the Ottawa-Carleton Catholic School Board, the Ottawa-Carleton Public School Board and several Ottawa-area private schools. Of the participants, 1690 were enrolled in a district-public school, 356 in a Catholic school, 371 in a private school, and 101 in a public alternative school. Eight hundred and eighty-one students were in the seventh grade (35%), 431 in the eighth grade (17.1%), 838 in the ninth grade (33.3%), 204 in the tenth grade (8.1%), 44 in the eleventh grade (1.7%), and 116 in the twelfth grade (4.6%). Of the 2518 participants, 1455 were female (58 %) and 1063 (42%) were male. Males and females had a mean objectively measured BMI of 21.11 and 21.10, respectively, which is very similar to the national average of 22.1 for Canadian adolescents (Shields, 2005). The ethnic composition of the sample was 1323 (52.5%) North American and 1195 (47.5%) non-North American. Two thousand, two hundred and forty-six (89.1%) of participants reported having college or university educated parents,

compared to only 274 (10.9%) of participants with parents who had a high school diploma or less, indicating that participants came from well educated and likely middle to upper-middle class families, which is representative of the Ottawa region (Dall, Levebvre, Pacey, & Sahai, 2006).

Procedure and Design

During the first visit, research staff presented an overview of the study to students in a designated area in the school (i.e., the library or classroom), answered questions related to the study, and distributed parental consent and student assent forms (see Appendix A), which they were required to complete in order to participate in the study. Approximately one week later, research staff returned to the school to collect consent and assent forms and to administer the questionnaire package to participating students. Prior to distributing the questionnaire packages, research staff reminded participants that participation in the study was voluntary and students could choose to withdraw from the study at any time during the questionnaire period.

Participants were also informed that they did not have to answer any questions that made them feel uncomfortable. The measures were in the form of a 10 page (double-sided) booklet and included a selection of self-report instruments. The total completion time for the questionnaire package was approximately 75 minutes and research staff were present during the questionnaire period to provide supervision and to address any questions or concerns. Upon completing the questionnaire package, students were asked to proceed to a private area where confidential measurements of height and weight were taken by a research staff member to calculate BMI. Questionnaires were scored within 48 hours. If a participant indicated a high level of depression, suicidal ideations or disordered eating behaviours, a professional member of the research team (i.e., a psychiatrist or psychologist) met with the student to provide a follow-up.

Measures

The measures used in the current study were selected from the questionnaire booklet that each participant completed. These measures were chosen to assess perfectionism and externalized self-perception as moderating variables on the relationship between perceived family functioning and disordered eating behaviours. Socio-demographic variables (i.e., parental education as a proxy of SES and participants' age, ethnicity, and BMI) that had a significant effect on disordered eating behaviours were controlled for in the current study.

Demographics. Demographic information (See Appendix C) including gender (male or female), parental level of education (i.e., “he/she didn’t finish high school”, “high school diploma”, or “college or university degree”) ethnicity, and age determined from date of birth were collected from each participant.

BMI. Participants' weight was measured in kilograms using a digital scale (Health o meter; model 830KL; Bridgeview IL) and height was measured in centimeters using a stadiometer (Seca; model 217; Ontario, CA) and was recorded in centimeters to the nearest 0.1cm. Participants' height was converted into metres and used to calculate BMI. $BMI = \text{weight (kg)}/\text{height (m)}^2$.

Disordered Eating Behaviours. *The Dutch Eating Behaviour Questionnaire* (DEBQ; Van Strien et al., 1986) is a 33 item self-report questionnaire used to measure disordered eating behaviours (See Appendix D). The DEBQ includes three subscales. The *Restrained Eating* subscale is composed of 10 items (e.g., item 2 “Do you try to eat less at mealtimes than you would like to eat?”) and is used to measure the extent to which individuals restrict their food intake. The *Emotional Eating* subscale includes 13 items (e.g., item 13 “Do you have a desire to eat when you are depressed or discouraged?”) and is used to measure the extent to which one

will eat to obtain comfort and/or to cope with one's emotions. The *External Eating* subscale includes 10 items (e.g., item 30 "If you see others eating, do you have a desire to eat?") and is used to measure how frequently an individual will eat when he or she is presented with a food cue. Participants were asked to respond to questions on the DEBQ using a 5-point Likert scale where 1 indicates "Never" and 5 indicates "Very often". A total score is obtained by calculating the mean response to corresponding subscale items. Mean total scores for each subscale can range from 1 to 5, with higher scores indicating a higher level of disordered eating behaviours. The DEBQ has been found to be a reliable measure for use in child (Halvarsson & Sjoden, 1998) and adolescent populations (Burton, Smit, & Lightowler, 2007; Norwood et al., 2011). For the purposes of the current study, the *Restrained Eating* and *Emotional Eating* subscales were used. The internal consistency in the present sample, using Chronbach's alpha, for *Restrained Eating* was .93 for females and .87 for males. The internal consistency for *Emotional Eating* was .95 for females and .93 for males.

Perceived Family Adaptability and Cohesion. The *Family Adaptability and Cohesion Scale* (FACES II; Olson, Portner & Bell, 1982) is a 30-item self-report questionnaire, composed of two subscales (See Appendix E). The *Family Adaptability* subscale includes 14 items that measure a variety of components associated with family adaptability, such as: assertiveness, control, discipline, leadership, negotiation, roles and rules (e.g., item 8 "Family members discuss problems and feel good about the solutions" and item 20 "Our family tries new ways of dealing with problems"). The 14 items combined provide a total family adaptability score. Adaptability scores can range from 15 to 70. Based on the *Circumplex Model of Marital and Family Systems* (Olson et al., 1979; 1983), low scores on the adaptability scale are indicative of rigid family functioning; average scores represent mid-range family functioning and high scores are

associated with chaotic family functioning. The *Family Cohesion* subscale is composed of 16 items that measure the emotional bonding family members have toward each other and the degree to which family members are socially connected or separated from each other (e.g., item 7 “Our family does things together” and item 23 “Family members like to spend their free time with each other”). Cohesion scores can range from 15 to 80. According to the Circumplex Model of Marital and Family Systems (Olson et al., 1979; 1983) and noted in other empirical work (Vincent & McCabe, 2000; Leon et al., 1994), low scores on the FACES cohesion subscale are indicative of disengaged family functioning; average scores represent mid-range family functioning and high scores are characteristic of enmeshed family functioning. Participants were asked to respond to questions on this scale using a 5-point Likert scale where 1 represents “Almost never” and 5 represents “Almost always”. The internal consistency in the present sample, using Chronbach’s alpha, for *Perceived Family Cohesion* was .85 for males and .89 for females. The internal consistency for *Perceived Family Adaptability* was .81 for both males and females. Several versions of the FACES have been created over the years and have been used successfully to identify patterns of family functioning that correlate with measures of EDs in both clinical (Tachi, 1999; Vidovic et al., 2005) and non-clinical samples (Holston & Cashwell, 2000; Kagan & Squires, 1985; Lundholm & Waters, 1991).

Perfectionism. *The McKnight Risk Factor Survey IV* (MRFS IV; The McKnight Investigators, 2003) is a 103-item self-report questionnaire used to assess risk and protective factors related to disordered eating behaviours in preadolescents and adolescents (See Appendix F). The REAL study adapted 69 items from the MRFS IV to measure risk and protective factors associated with eating behaviours among adolescents (e.g., perfectionism, self-esteem, negative life events, and depressed mood). Of interest to the current study is the *Perfectionism* subscale,

which includes five statements that are answered using a 5-point Likert scale where 1 indicates “Not at all” and 5 indicates “Totally”. A total score is obtained by calculating the mean response to corresponding items on the subscale. Scores can range from 1 to 5, with higher scores indicating a higher level of perfectionism. Sample statements from the *Perfectionism* subscale include: “Only outstanding performance is good enough in my family” (item 51) and “I feel that I must do things perfectly or not do them at all” (item 54). *Perfectionism* was examined as a potential moderating variable on the relationship between perceived family functioning and disordered eating behaviours in the current study. The internal consistency in the present sample, using Chronbach’s alpha, for the *Perfectionism* subscale was .79 and .77 for females and males, respectively.

Externalized Self-Perception. The *Silencing the Self Scale for Adolescents* (STSS-A; Jack & Dill 1992; Norwood, Buchholz, Henderson, Flament, & Goldfield, 2007; Sippola & Bukowski, 1996) was used in the current study to measure adolescents’ level of externalized self-perception (See Appendix G). The STSS-A was originally adapted for use in adolescents by Sippola and Bukowski (1996) to assess the dynamics of friendships instead of romantic relationships, which the original 31-item STSS (Jack & Dill, 1992) measured. The STSS-A has been found to be suitable for use in an adolescent sample (Norwood et al., 2011). A principal components analysis identified a three factor structure that was identical for males and females (Norwood et al., 2007). The STSS-A is a self-report measure composed of 15 statements, which are answered using a 5-point Likert scale where 1 indicates “Strongly disagree” and 5 indicates “Strongly agree”. The STSS-A is composed of three subscales. The *Silencing the Self* subscale measures the degree to which individuals refrain from expressing their true thoughts and feelings to avoid conflict with others (e.g., item 12 “When my friends’ opinions conflict with mine, rather

than asserting my own point of view, I usually end up agreeing with them”). The *Care as Self-Sacrifice* subscale scale measures the extent to which individuals sacrifice their own needs to benefit others (e.g. item 7 “Caring means choosing to do what my friends want even when I want to do something different”). Finally, the *Externalized Self-Perception* subscale, which was used in the current study measures the extent to which individuals judge themselves based on external standards (e.g., item 9 “I feel I have to act in a certain way to please my friends” and item 11 “In order for my friends to like me, I cannot reveal certain things about myself to them”). The *Externalized Self-Perception* subscale includes seven items. A total score on this subscale can range from 7 to 35, with higher scores indicative of a greater tendency to rely on external standards and/or weigh the perceptions and feelings of peers more strongly than one’s own. The internal consistency in the present sample, using Chronbach’s alpha, for the *Externalized Self-Perception* subscale was .83 for males and .84 for females.

Ethics

The study was approved by the Research Ethics Boards at the Royal Ottawa Mental Health Centre, the Children’s Hospital of Eastern Ontario, Carleton University and research councils at the Ottawa public and separate school boards. Private schools provided individual consent to participate in the study. Participants were included in the REAL study if they provided informed consent from at least one parent or guardian and informed assent. Questionnaires were completely confidential and were coded numerically, with a master list that corresponded to each participant’s name and ID number. The questionnaires and consent forms were stored in separate locked filing cabinets, which could only be accessed by research staff.

Results

The first goal of the current study was to examine perceived family functioning as a predictor of disordered eating behaviours in a community sample of adolescents. The second goal of the study was to test whether perfectionism and externalized self-perception moderated the relationship between perceived family functioning and disordered eating behaviours. The Statistical Package for the Social Sciences (SPSS 19) was used to perform all statistical analyses in the present study. The data were validated by examining maximum and minimum scores to ensure that each item was scored correctly and within the proper scoring range. Subscale scores and total scores for each scale were also examined to ensure that the data were not skewed by participants' inaccurate responding.

Preliminary Analyses

Missing Data. After ensuring that all data had been entered within an appropriate range for each of the measures of interest to the present study, a missing value analysis (MVA) was conducted. Among the six research variables of interest, the MVA indicated that four of the variables had a missing rate of 1% or less. One of the independent variables, *family adaptability*, had a missing rate of 3.4% and one of the moderating variables, *externalized self-perception*, had a missing rate of 9.7%. A Little's MCAR test was performed to further explore the missing data in the study. Results from this test, $\chi^2(52) = 48.33, p = .619$, revealed that the data met criteria for missing completely at random. Therefore, cases with missing data remained in the dataset and the Expectation- Maximization (EM) algorithm was used to impute for missing values (Dempster, Laird, & Rubin, 1977). However, to ensure imputed values were reasonable, participants missing on three or more of the variables of interest were removed from the dataset. In total, only four participants were excluded.

Testing of Assumptions. The assumptions for all multiple regression models were examined. The normality assumption was verified by assessing the distribution of model residuals (Tabachnick & Fidell, 2007). For all models, the distribution was not discordant from the normal distribution. The linearity and homoscedasticity assumptions were confirmed by inspecting scatterplots of model residuals versus predicted values. The scatterplots revealed no systematic patterns, suggesting model assumptions were met.

Potential Control Variables. Prior to testing the hypotheses, socio-demographic variables which have been found to be related to the dependent variables and could therefore influence the study's findings were examined. All socio-demographic variables that had a significant effect on restrained or emotional eating were statistically controlled for in the study. Regression analyses were conducted with the two dependent variables regressed on the control variables to test for significance. Parental level of education ($p < .01$), ethnicity ($p < .01$), and BMI ($p < .001$) were found to have a significant effect on restrained eating whereas only age ($p < .001$) was found to have a significant effect on emotional eating. In the main regression analyses, parental level of education, ethnicity, and BMI were controlled for in models predicting restrained eating and age was controlled for in models predicting emotional eating.

In the present study, parental level of education was a categorical variable with two levels, completion of college or university (baseline group), and high school or below. For ethnicity, participants were categorized into two groups, North American (baseline group), and non-North American. BMI and age were measured on a continuous scale.

Descriptive Statistics. Descriptive statistics for all measures of interest in the current study are presented in Table 1. As expected, females scored significantly higher than males on restrained eating, $F(1, 2516) = 128.44, p < .001$ and emotional eating, $F(1, 2516) = 225.67, p <$

.001. A correlation matrix of bivariate correlations among the variables is presented in Table 2. An examination of Table 2 indicates that, for both males and females, the variables of interest were correlated in the expected direction.

Table 1

Descriptive Statistics for the Independent, Dependent, and Moderating Variables for Females (n = 1455) and Males (n = 1063).

	Females		Males		Females		Males	
	<i>M (SD)</i>	<i>M (SD)</i>	Min	Max	Min	Max	Min	Max
Restrained Eating	1.82 (.79)	1.50 (.55)	1	5	1	5	1	4.20
Emotional Eating	1.93 (.82)	1.48 (.60)	1	5	1	5	1	5
Family Cohesion	49.02 (6.27)	47.89 (6.56)	21	80	21	80	21	80
Family Adaptability	41.53 (7.27)	41.80 (7.18)	14	70	14	70	14	70
Perfectionism	2.39 (.87)	2.41 (.85)	1	5	1	5	1	5
Self-Perception	15.85 (5.04)	16.03 (4.99)	7	34	7	34	7	35

Note: The standard deviation is shown in brackets; Self-Perception = externalized self-perception.

Table 2

Correlations Between Restrained Eating, Emotional Eating, Perfectionism, and Externalized Self-Perception for Females (n = 1455) and Males (n = 1063).

	1	2	3	4
Restrained Eating	1	.25**	.23**	.31**
Emotional Eating	.18**	1	.15**	.32**
Perfectionism	.19**	.16**	1	.17**
Self-Perception	.22**	.24**	.11**	1

Note: Correlations for females and males appear above and below the diagonal, respectively. 1

and 2 are subscales from the Dutch Eating Behaviour Questionnaire; 3 is a subscale from the

McKnight Risk Factor Survey and 4 is a subscale from the Silencing the Self Scale for

Adolescents; Self-Perception = externalized self-perception. All measures included 5-point

scales. * $p < .05$, ** $p < .01$

Categorization of Family Functioning Variables. Both family functioning subscales, family cohesion and family adaptability, were measured on a continuous scale. However, for the current study, these subscales were categorized into three groups (low, medium and high). The rationale for categorization was motivated by interpretability of the scales. Based on the *Circumplex Model of Marital and Family Systems* (Olson et al., 1979; 1983), high values on the cohesion subscale indicate *enmeshed* families, medium values suggest *mid-range* families, and low values are associated with *disengaged* families. Similarly, on the adaptability scale, high values indicate *chaotic* families, medium values represent *midrange* families, and low values are associated with *rigid* families. Based on this model, families with high scores (e.g., enmeshed) are qualitatively different from families with low (e.g., disengaged) or mid-range scores, making it important to treat them as distinct groups and not on a continuum.

In the present study, participants were considered to perceive their families as *disengaged* if they scored less than the 25th percentile on the family cohesion subscale, *mid-range* if they scored between the 25th and 75th percentile, and *enmeshed* if they scored above the 75th percentile. Table 3 presents the mean scores of the family cohesion subscale by the three family groups for females and males. Mean scores appear to be very similar across gender for each category.

Similarly, participants were considered to perceive their families as *rigid* if they scored less than the 25th percentile on the family adaptability subscale, *mid-range* if they scored between the 25th and 75th percentile, and *chaotic* if they scored above the 75th percentile. Table 4 presents the mean scores of the family adaptability subscale by the three family groups for females and males. An examination of Table 4 indicates that scores are very similar across gender for each category.

Table 3

Mean Family Cohesion Scores by Gender

	Gender	
	Female	Male
Low cohesion (Disengaged)	40.17 (3.96)	39.79 (4.63)
Medium cohesion (Mid-range)	48.82 (2.23)	48.50 (2.24)
High cohesion (Enmeshed)	56.14 (3.15)	55.76 (3.33)

Note: Standard Deviations appear beside the means.

Table 4

Mean Family Adaptability Scores by Gender

	Gender	
	Female	Male
Low adaptability (Rigid)	32.57 (4.04)	32.12 (5.10)
Medium adaptability (Mid-range)	42.01 (2.47)	42.05 (2.40)
High adaptability (Chaotic)	50.37 (3.41)	50.59 (3.46)

Note: Standard Deviations appear beside the means.

Descriptive Analyses by Family Group

A multivariate analysis of variance (MANOVA) was conducted to examine the relationship between the family cohesion groups (enmeshed, mid-range, and disengaged) as independent variables and the individual difference factors (perfectionism and externalized self-perception) as well as eating behaviours (restrained and emotional eating) as dependent variables, by gender.

Results indicated a significant multivariate main effect for the cohesion groups Wilks' $\lambda = .96$, $F(8, 5018) = 12.30$, $p < .001$, partial eta squared = .019, and a significant family cohesion group by gender interaction ($p < .05$). Given the significance of the overall test, the univariate main effects were examined. The univariate results indicated significant between-subject effects for perfectionism, $F(2, 2518) = 3.23$, $p < .05$, partial eta squared = .003, and externalized self-perception, $F(2, 2518) = 40.04$, $p < .001$, partial eta squared = .031 and emotional eating, $F(2, 2518) = 3.00$, $p < .05$, partial eta squared = .002, but not for restrained eating. In addition, significant family cohesion by gender interactions were obtained for perfectionism and emotional eating.

Significant levels of family cohesion group pairwise differences were obtained for perfectionism, externalized self-perception and emotional eating. With respect to perfectionism, post-hoc tests (LSD) indicated that individuals from disengaged families ($M = 2.32$) reported significantly lower levels of perfectionism than individuals from both mid-range ($M = 2.42$, $p = .049$) and enmeshed families ($M = 2.45$, $p = .041$). This was qualified by a significant interaction with gender. Univariate analyses conducted separately by gender indicated that the effect was only significant for males.

With respect to externalized self-perception, post-hoc comparisons (LSD) revealed that all family cohesion groups differed significantly from one another ($p < .001$), with individuals from disengaged families scoring the highest ($M = 17.03$), individuals from enmeshed families scoring the lowest ($M = 14.54$) and individuals from mid-range families scoring in the middle ($M = 16.13$). With respect to emotional eating, post-hoc comparisons (LSD) indicated that individuals from mid-range families ($M = 1.74$) reported significantly higher levels of emotional eating than individuals from enmeshed families ($M = 1.65, p = .012$). This was qualified by a significant gender by family cohesion interaction for the emotional eating variable. Univariate analyses conducted separately by gender indicated that this relationship was only significant for females.

A second MANOVA was conducted to examine the relationship between the family adaptability groups (rigid, mid-range, and chaotic) as independent variables and the individual difference factors (perfectionism and externalized self-perception) as well as eating behaviours (restrained and emotional eating) as dependent variables, by gender.

Results indicated a significant multivariate main effect for the adaptability groups Wilks' $\lambda = .96, F(8, 5018) = 11.99, p < .001$, partial eta squared = .019, and a significant family adaptability group by gender interaction ($p < .01$). Given the significance of the overall test, the univariate main effects were examined. The univariate results indicated significant between-subject effects for externalized self-perception, $F(2, 2518) = 41.02, p < .001$, partial eta squared = .032, but not for perfectionism. Univariate results also indicated significant between-subject effects for emotional eating, $F(2, 2518) = 11.98, p < .001$, partial eta squared = .009, but not for restrained eating.

Significant levels of family adaptability group pairwise differences were obtained for externalized self-perception and emotional eating. With respect to externalized self-perception, post-hoc tests (LSD) indicated that all family adaptability groups differed significantly from one another ($p < .001$), with individuals from rigid families scoring the highest ($M = 17.01$), individuals from chaotic families scoring the lowest ($M = 14.48$) and individuals from mid-range families scoring in the middle ($M = 16.11$). Similarly, with respect to emotional eating, post-hoc comparisons (LSD) indicated that all family adaptability groups differed significantly from one another ($p < .01$), with individuals from rigid families scoring the highest ($M = 1.78$), individuals from chaotic families scoring the lowest ($M = 1.59$) and individuals from mid-range families scoring in the middle ($M = 1.72$). This was qualified by a significant gender by family adaptability interaction for the emotional and restrained eating variables. Univariate analyses conducted separately by gender indicated that for emotional eating, results were more variable for males, but the same pattern indicating lower scores for chaotic families was consistent across genders. With respect to restrained eating, for males only, individuals in chaotic families scored significantly higher than individuals in the other family groups.

In summary, family variables did not appear to have a strong effect on disordered eating behaviour. There were no significant main effects on restrained eating and for emotional eating, results were somewhat contrary to hypotheses, with adolescents of mid-range families (mid-range cohesion) and rigid families (low adaptability) having the highest levels of emotional eating behaviour. In terms of the individual difference variables, adolescents from enmeshed families scored highest on perfectionism and this was stronger for males than females. In addition, adolescents from disengaged and rigid families scored highest on externalized self-perception.

Hierarchical Regression Analyses

Overview. The goal of the hierarchical regression analyses was to examine the main effect of family functioning (perceived family adaptability and cohesion) on disordered eating behaviours. Based on the hypotheses of the study, the analyses examined: perceived family enmeshment (i.e. high family cohesion) as a predictor of restrained eating, perceived family disengagement (i.e. low family cohesion) as a predictor of emotional eating, and perceived family rigidity (i.e., low family adaptability) as a predictor of both restrained eating and emotional eating. Due to a lack of research implicating perceived family chaos (i.e., high family adaptability) in disordered eating behaviours, family chaos was not examined as a predictor of restrained or emotional eating in the present study. In all regression models, the main effect of the family functioning group was dummy coded as 1 and the remaining groups were dummy coded as 0. For example, to examine the effect of *enmeshed families* relative to *non-enmeshed families* (i.e., mid-range and disengaged), on restrained eating, enmeshed families were dummy coded as 1 and non-enmeshed families were dummy coded as 0.

The dependent variable considered in the regression models, disordered eating, was either restrained eating or emotional eating. Among adolescents, very few studies have examined family adaptability and family cohesion as predictors of disordered eating. As such, the models were constructed to isolate the subscales of family functioning and disordered eating behaviour. Therefore, four separate regression models were constructed to analyze the main effects. Additionally, two moderating variables were added to each regression model to test for the presence of moderating effects. The moderating variables considered were perfectionism and externalized self-perception. To avoid multicollinearity and ease interpretation of moderating effects, perfectionism and externalized self-perception were standardized prior to analyses.

Finally, given the observed gender differences in eating behaviours from studies which have included males and females (Elgin & Pritchard, 2006; Goldfield et al., 2011; Robles, 2010), the data in the present study were split by gender prior to running regression models in attempt to better observe gender-specific familial and individual difference risk-factors for disordered eating behaviours.

For each regression model, step 1 includes the appropriate control variables. Step 2 adds the family functioning variable. At step 3, the two moderating variables are added. Lastly, step 4 adds the two-way interaction terms between the family functioning variable and the moderating variables. Unstandardized regression coefficients and the significance level are reported for each model. Results were considered statistically significant if alpha was $< .05$.

Family Cohesion & Disordered Eating Behaviours

Perceived Family Enmeshment & Restrained Eating. In this section, the main effect of enmeshed families (i.e., high family cohesion) as compared to mid-range families (i.e., average family cohesion) and disengaged families (i.e., low family cohesion) on restrained eating was tested, using hierarchical regression analyses. The potential moderating effects of perfectionism and externalized self-perception were also examined. Based on the regression analysis conducted to determine which control variables would have a significant effect on restrained eating (see section on potential control variables) parental education, BMI, and ethnicity, were controlled for in the restrained eating models.

For females, on step 1, parental education, BMI, and ethnicity significantly predicted restrained eating. Specifically, lower parental education, higher BMI and non-North American ethnic background predicted greater levels of restrained eating. On step 2, family enmeshment did not significantly predict restrained eating. On step 3, perfectionism and externalized self-

perception were significant positive predictors of restrained eating. On step 4, the family enmeshment x perfectionism and the family enmeshment x externalized self-perception interactions were not significant, indicating that the relationship between perceived family enmeshment and restrained eating did not change based on level of perfectionism and externalized self-perception (see Table 5).

For males, on step 1 of the regression, parental education, BMI, and ethnicity were significant predictors of restrained eating. That is, lower parental education, higher BMI and non-North American ethnic background predicted greater levels of restrained eating. On step 2 family enmeshment did not significantly predict restrained eating. However, after the inclusion of the moderating variables on step 3, results indicated that family enmeshment was significantly and positively predictive of restrained eating ($\beta = 0.10, p < .01$). Given that the magnitude of the relationship between perceived family enmeshment and restrained eating increased once perfectionism and externalized self-perception were included in the regression model, it appears that perfectionism and externalized self-perception acted as suppressor variables, defined as a “variable that increases the predictive validity of another variable by its inclusion in a regression equation” (Conger, 1974, pp.36-37). Perfectionism and externalized self-perception were also significant positive predictors of restrained eating. When the family enmeshment x perfectionism and the family enmeshment x externalized self-perception interaction terms were added on step 4, the main effect of family enmeshment remained significant ($\beta = 0.10, p < .01$). However, both interaction terms were non-significant (see Table 6).

Table 5

Hierarchical Regression Analyses of Perceived Family Enmeshment on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.13	72.79***			
Parental Education (High School or Below)					.09*
Ethnicity (Non-North American)					.09*
BMI					.08***
Step 2	.13	55.50***	.00	3.27	
Enmeshment					-.08
Step 3	.25	80.37***	.12	112.96***	
Perfect					.19***
Perception					.26***
Step 4	.25	60.76***	.00	1.72	
Enmeshment x Perfect					-.00
Enmeshment x Perception					.08

Note: Enmeshment = perceived family enmeshment, dummy coded (1=high family cohesion and 0 = medium/low family cohesion). Perfect = Perfectionism; Perception = externalized self-perception; Parental education was dummy coded (1=high school or below and 0 = college or university); Ethnicity was dummy coded (1= non-North American and 0 = North American).

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

Table 6

Hierarchical Regression Analyses of Perceived Family Enmeshment on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.14	56.66***			
Parental Education (High School or Below)					.09*
Ethnicity (Non-North American)					.08*
BMI					.05***
Step 2	.14	43.24***	.00	2.69	
Parental Education (High School or Below)					.09*
Ethnicity (Non-North American)					.08*
BMI					.05***
Enmeshment					.06
Step 3	.21	46.44***	.12	45.56***	
Parental Education (High School or Below)					.07
Ethnicity (Non-North American)					.07*
BMI					.05***
Enmeshment					.10**
Perfect					.08***

Perception					.12***
Step 4	.21	34.82***	.00	.18	
Parental Education (High School or Below)					.06
Ethnicity (Non-North American)					.07*
BMI					.05***
Enmeshment					.10**
Perfect					.08***
Perception					.11***
Enmeshment x Perfect					.00
Enmeshment x Perception					.02

Note: Enmeshment = perceived family enmeshment, dummy coded (1=high family cohesion and 0 = medium/low family cohesion). Perfect = Perfectionism; Perception = externalized self-perception; Parental education was dummy coded (1=high school or below and 0 = college or university). Ethnicity was dummy coded (1= non-North American and 0 = North American).

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

Perceived Family Disengagement & Emotional Eating. In this section, the main effect of disengaged families (i.e., low family cohesion) as compared to mid-range families (i.e., average family cohesion) and enmeshed families (i.e., high family cohesion) on emotional eating was tested using hierarchical regression analyses. Also examined was whether this main effect was moderated by perfectionism and externalized self-perception. Based on the regression analysis conducted to determine which socio-demographic variables had a significant effect on emotional eating (see section on potential control variables), age was controlled for in the emotional eating models.

For females, on step 1, age was a significant predictor of emotional eating, such that age was positively related to emotional eating. On step 2, results indicated that family disengagement did not significantly predict emotional eating. On step 3, both perfectionism and externalized self-perception significantly and positively predicted emotional eating. Finally, on step 4, the family disengagement x perfectionism and the family disengagement x externalized self-perception interactions were both significant. Specifically, as hypothesized, perfectionism *strengthened* the relationship between perceived family disengagement and emotional eating. Contrary to what was hypothesized, externalized self-perception *weakened* this relationship. See Table 7 for a summary of the results.

A follow-up simple slopes analysis was conducted, with two categories for each moderator. The levels chosen correspond to a low level (one standard deviation below the mean) and a high level (one standard deviation above the mean). The values of these levels for perfectionism were 10.80 and 20.89, respectively. The treatment effect of family disengagement on emotional eating for low levels of perfectionism was significantly negative ($\beta = -0.136$,

$p < .05$). However, for high levels of perfectionism, the treatment effect was positive ($\beta = .108$, $p = .13$). This is presented graphically in Figure 2.

For externalized self-perception, the values for low and high levels were 1.53 and 3.26, respectively. The treatment effect of family disengagement on emotional eating for low levels of externalized self-perception was positive ($\beta = .090$, $p = .23$). However, for high levels of externalized self-perception, the treatment effect was negative ($\beta = -.117$, $p = .06$). This is presented graphically in Figure 3.

Table 7

Hierarchical Regression Analyses of Perceived Family Disengagement on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.06	97.43***			
Age					.14***
Step 2	.06	49.00***	.00	.60	
Disengagement					.04
Step 3	.16	70.99***	.10	87.17***	
Perfect					.07***
Perception					.24***
Step 4	.17	49.03***	.01	4.43*	
Disengagement x Perfect					.12*
Disengagement x Perception					-.10*

Note: Disengagement = perceived family disengagement, dummy coded (1=low family cohesion and 0 = medium/high family cohesion). Perfect = perfectionism; Perception = externalized self-perception; * $p < .05$, *** $p < .001$

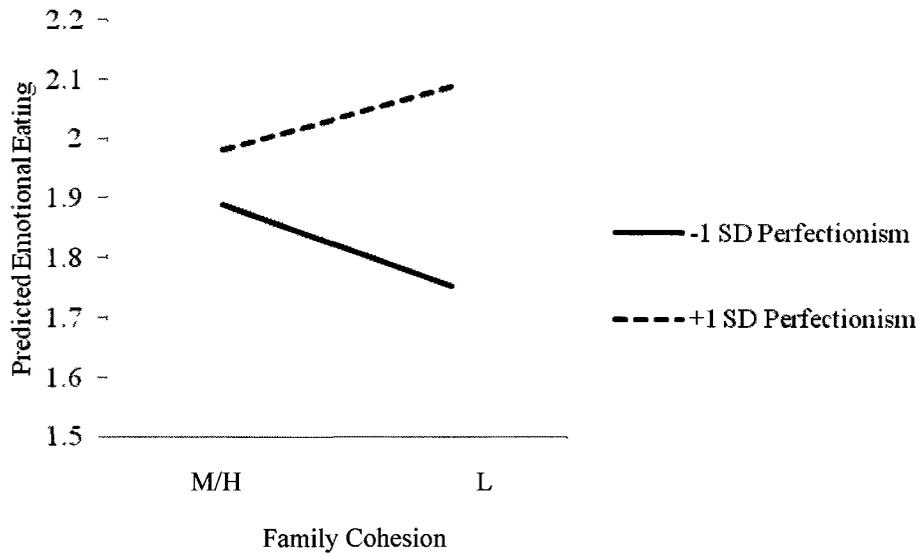


Figure 2. The relation between perceived family cohesion and emotional eating as a function of perfectionism for female adolescents.

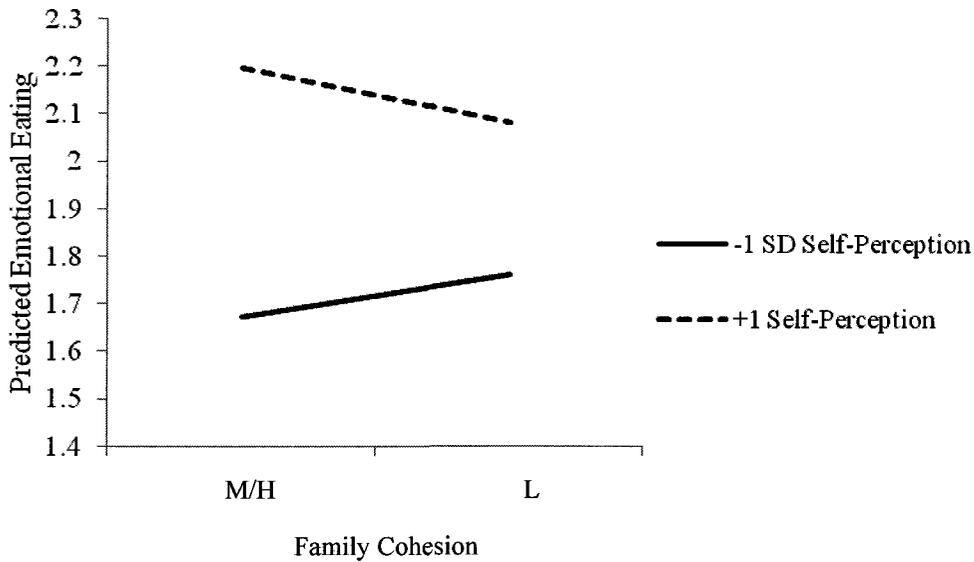


Figure 3. The relation between perceived family cohesion and emotional eating as a function of externalized self-perception for female adolescents.

For males, results from the regression analysis examining disengaged families (i.e., low family cohesion) and emotional eating indicated that on step 1, age was a significant positive predictor of emotional eating. On step 2, family disengagement was not a significant predictor of emotional eating. On step 3, both perfectionism and externalized self-perception were significant positive predictors of emotional eating. Finally, on step 4, the family disengagement x perfectionism interaction and the family disengagement x externalized self-perception interaction were both non-significant, indicating that for males, the relationship between perceived family disengagement and emotional eating did not vary based on level of perfectionism or externalized self-perception. Results are presented in Table 8.

Table 8

Hierarchical Regression Analyses of Perceived Family Disengagement on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.01	13.50***			
Age					.04***
Step 2	.02	7.95***	.00	2.37	
Disengagement					-.06
Step 3	.09	25.69***	.07	42.81***	
Perfect					.07***
Perception					.14***
Step 4	.09	17.73***	.00	1.73	
Disengagement x Perfect					.02
Disengagement x Perception					-.07

Note: Disengagement = perceived family disengagement, dummy coded (1= low family cohesion and 0 = medium/high family cohesion); Perfect = perfectionism; Perception = externalized self-perception. *** $p < .001$

Family Adaptability & Disordered Eating Behaviours

Perceived Family Rigidity & Restrained Eating. In this section, the main effect of rigid families (i.e., low family adaptability) as compared to mid-range families (i.e., average family adaptability) and chaotic families (i.e., high family adaptability) on restrained eating was tested. Of additional interest was whether the main effect was moderated by perfectionism and externalized self-perception.

Results from the female regression model and the male regression model indicated that, on step 1, parental education, BMI, and ethnicity were significant predictors of restrained eating. However, on step 2, family rigidity did not significantly predict restrained eating. On step 3, perfectionism and externalized self-perception were both significant positive predictors of restrained eating. On step 4, the family rigidity x perfectionism and the family rigidity x externalized self-perception interactions were not significant, meaning that the relationship between perceived family rigidity and restrained eating did not vary based on level of perfectionism or externalized self-perception for both females and males. The findings from these analyses are summarized in Table 9 and Table 10 for females and males, respectively.

Table 9

Hierarchical Regression Analyses of Perceived Family Rigidity on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.

Predictor Variable	R ²	F	ΔR ²	ΔF	β
Step 1	.13	72.79***			
Parental Education (High School or Below)					.09*
Ethnicity (Non-North American)					.09*
BMI					.08***
Step 2	.13	55.51***	.00	3.30	
Rigidity					.01
Step 3	.25	80.37***	.07	112.95***	
Perfect					.14***
Perception					.20***
Step 4	.25	60.49***	.00	.87	
Rigidity x Perfect					-.00
Rigidity x Perception					-.05

Note: Rigidity = perceived family rigidity, dummy coded (1 = low family adaptability and 0 = medium and high family adaptability); Perfect = perfectionism; Perception = externalized self-perception. Parental education was dummy coded (1=high school or below and 0 = college or university). Ethnicity was dummy coded (1= non-North American and 0 = North American).

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

Table 10

Hierarchical Regression Analyses of Perceived Family Rigidity on Restrained Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.14	56.66***			
Parental Education (High School or Below)					.09*
Ethnicity (Non-North American)					.08**
BMI					.05***
Step 2	.14	42.65***	.00	.65	
Rigidity					-.03
Step 3	.21	45.44***	.07	44.09***	
Perfect					.08***
Perception					.11***
Step 4	.21	34.06***	.00	.15	
Rigidity x Perfect					.02
Rigidity x Perception					.01

Note: Rigidity = perceived family rigidity, dummy coded (1 = low family adaptability and 0 = medium and high family adaptability). Perfect = perfectionism; Perception = externalized self-perception. Parental education was dummy coded (1=high school or below and 0 = college or university). Ethnicity was dummy coded (1= non-North American and 0 = North American).

* $p < .05$, ** $p < .01$, *** $p < .001$

Perceived Family Rigidity & Emotional Eating. In this section, hierarchical regression analyses were conducted to investigate the main effect of rigid families (i.e., low family adaptability) as compared to mid-range families (i.e., average family adaptability) and chaotic families (i.e., high family adaptability) on emotional eating. Also examined was whether the main effect was moderated by perfectionism and externalized self-perception.

For females, on step 1 of the regression analysis, age was a significant and positive predictor of emotional eating. On step 2, family rigidity was a significant positive predictor of emotional eating. On step 3, both perfectionism and externalized self-perception were significant positive predictors of emotional eating. Finally, on step 4, the family rigidity x perfectionism interaction was significant, whereas the family rigidity x externalized self-perception was non-significant, indicating that the relation between perceived family rigidity and emotional eating differs for level of perfectionism, but not for level of externalized self-perception. Specifically, as hypothesized, perfectionism *strengthened* the relationship between perceived family rigidity and emotional eating. See Table 11.

A follow-up simple slopes analysis was conducted, with two categories for perfectionism. The levels chosen correspond to a low level (one standard deviation below the mean) and a high level (one standard deviation above the mean). The values of these levels were 10.80 and 20.89, respectively. The treatment effect of family rigidity on emotional eating for low levels of perfectionism was almost zero ($\beta = .017, p > .05$). However, for high levels of perfectionism, the treatment effect was positive ($\beta = .215, p < .01$). This is presented graphically in Figure 4.

Table 11

Hierarchical Regression Analyses of Perceived Family Rigidity on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Females.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.06	97.42***			
Age					.14***
Step 2	.07	57.56***	.01	16.64***	
Rigidity					.19***
Step 3	.17	72.89***	.09	81.82***	
Perfect					.07***
Perception					.23***
Step 4	.17	49.53***	.00	2.50	
Rigidity x Perfect					.10*
Rigidity x Perception					-.01

Note: Rigidity = perceived family rigidity, dummy coded (1 = low family adaptability and 0 = medium and high family adaptability); Perfect = perfectionism; Perception = externalized self-perception. * $p < .05$, *** $p < .001$

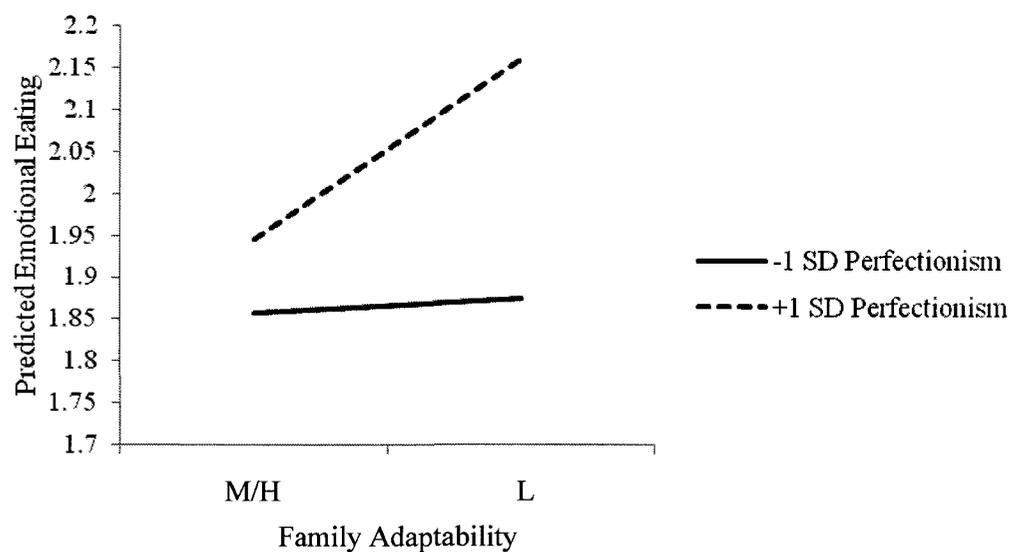


Figure 4. The relation between perceived family adaptability and emotional eating as a function of perfectionism for female adolescents.

For males, results from the regression analysis examining family rigidity (i.e., low family adaptability) and emotional eating revealed that on step 1, age was a significant predictor of emotional eating. On step 2, family rigidity did not predict emotional eating. On step 3, perfectionism and externalized self-perception were significant positive predictors of emotional eating. Finally, on step 4, the family rigidity x perfectionism and the family rigidity x externalized self-perception interactions were non-significant, indicating that for males, the relationship between perceived family rigidity and emotional eating does not depend on the level of perfectionism and externalized self-perception. Regression results are presented in Table 12.

Table 12

Hierarchical Regression Analyses of Perceived Family Rigidity on Emotional Eating and the Moderating Effects of Perfectionism and Externalized Self-Perception, for Males.

Predictor Variable	R ²	F	ΔR ²	ΔF	B
Step 1	.01	13.50***			
Age					.04***
Step 2	.02	6.79***	.00	.10	
Rigidity					-.01
Step 3	.09	24.72***	.07	42.12***	
Perfect					.07***
Perception					.13***
Step 4	.09	16.48***	.00	.08	
Rigidity x Perfect					.00
Rigidity x Perception					-.02

Note: Rigidity = perceived family rigidity, dummy coded (1 = low family adaptability and 0 = medium and high family adaptability). Perfect = perfectionism; Perception = externalized self-perception. *** $p < .001$

Summary of Results

The main purpose of the present study was to examine the relationship between perceived family functioning and disordered eating behaviours, considering the possible moderating effects¹ of two individual difference factors, perfectionism and externalized self-perception. With respect to restrained eating behaviours (i.e., inhibiting dietary intake to maintain a low body weight; Herman & Mack, 1975), perceived family functioning did not play a significant role. However, after controlling for the appropriate socio-demographic variables and the moderating variables, perceived family enmeshment was a significant predictor of restrained eating for males. Results indicated that perfectionism and externalized perceptions were significantly and positively related to restrained eating behaviour, for both males and females. With respect to emotional eating (i.e., overeating or bingeing due to negative emotional stress; Van Strien et al., 1986), results were considerably more complex and did highlight the significant role of family functioning for emotional eating behaviour, although this varied by gender.

For both males and females, higher perfectionism and higher externalized self-perception scores were predictive of greater levels of emotional eating. Thus, individuals who scored higher on these two moderating variables were at risk for engaging in both types of disordered eating behaviours – restrained and emotional eating. For males, there were no main effects of family functioning on emotional eating. For females, however, the pattern of results was more complex. While females who perceived their families to be rigid (i.e., low family adaptability) had a greater risk for emotional eating, this was qualified by a significant interaction between

¹ Mediation analyses were also considered. However, preliminary analyses indicated that the necessary statistical assumptions were not satisfied.

perfectionism and perceived family adaptability. Simple slope analyses indicated that higher levels of perfectionism *strengthened* the effect of perceived family rigidity on emotional eating.

Secondly, while perceived family disengagement (i.e., low family cohesion) was not predictive of greater levels of emotional eating, family disengagement did interact with both moderating variables. As expected, at higher levels of perfectionism there was a positive effect of family disengagement on emotional eating. However, contrary to what was expected, at higher levels of externalized self-perception there was a negative effect of family disengagement on emotional eating.

Discussion

The family, as the principle context in which children and adolescents are raised, has been recognized as an important influence in determining behaviour (Amato & Rezac, 1994). Within the ED literature, extreme forms of family functioning have been recognized as important risk factors in the etiology of eating pathology (Hodges et al., 1998; Ordman & Kirschenbaum; Vidovic et al., 2005). However, research in this area has typically been limited to clinical samples. Given that eating pathology is a public health concern among *youth*, with EDs being considered the third most prevalent chronic illness affecting American female adolescents (National Eating Disorders Association, 2008) and disordered eating behaviours becoming more common among both female and male adolescents (Croll et al., 2002; McCabe & Vincent, 2003), this research sought to examine the role of perceived family functioning in disordered eating behaviours among a community-based sample of female and male adolescents. Additionally, since there appears to be a limited amount of research investigating how perceived family functioning interacts with other known risk factors to predict eating pathology, this research also examined individual difference factors known to predict eating pathology (i.e., perfectionism and

externalized self-perception) as potential *moderating* variables in the relationship between perceived family functioning and disordered eating behaviours.

The present study extends previous research into the relationship between perceived family functioning and disordered eating among adolescents in several ways. First, this is the first known study to examine the effects of perceived family functioning on two specific types of disordered eating behaviours for males. The two specific types of disordered eating behaviours considered in the present study were restrained eating and emotional eating. In past research investigating the relationship between perceived family functioning and disordered eating behaviours (Felker & Stivers, 1994; Holston & Cashwell, 2000), researchers have typically used measures that assess both restrained and emotional eating collectively rather than separately. By separating these components of disordered eating, this study allowed for a more in-depth investigation of perceived family functioning on disordered eating. Relating specific family functioning styles to the distinct types of disordered eating behaviours could allow for the development of optimal prevention and treatment programs (Wallin & Hansson, 1999). Secondly, in response to research which has highlighted the importance of examining how different variables may interact with each other to heighten the risk of eating pathology (Kraemer et al., 2001), the inclusion of the potential moderating variables in the present study furthers our understanding of individual difference factors that can have an effect on the relationship between perceived family functioning and disordered eating behaviours.

To accurately test the hypotheses in the current study, the theoretical framework of the Circumplex Model of Marital and Family Systems (Olson et al., 1979;1983), which distinguishes adaptive forms of family functioning from maladaptive forms, was utilized as a guide to group participants on the family cohesion and family adaptability variables. It was expected that

enmeshed families, as compared to “non-enmeshed families” (i.e., mid-range and disengaged), would be predictive of restrained eating. It was expected that *disengaged families* as compared to “non-disengaged families” (i.e., mid-range and enmeshed) families would be predictive of emotional eating. It was also hypothesized that *rigid families* as compared to “non-rigid families” (i.e., mid-range and chaotic) would be predictive of both restrained and emotional eating among adolescents. Finally, perfectionism and externalized self-perception were expected to be significant moderators in these relationships. Specifically, these variables were hypothesized to *strengthen* these relationships.

Overall, results from the current study provide modest support that perceived family functioning increases adolescents’ risk for engaging in disordered eating behaviours. Additionally, this study found some evidence for perfectionism and externalized self-perception to *moderate* the relationship between perceived family functioning and disordered eating behaviours among female adolescents. The main findings of the study, which will be discussed in detail below include: 1.) Gender differences in perceived family functioning and disordered eating behaviours, 2.) Family functioning and emotional eating, and moderating effects, and 3.) Significant effects of individual difference factors on disordered eating behaviours.

Gender Differences

Preliminary analyses of the current study identified gender differences with respect to disordered eating behaviours. As expected, females scored significantly higher than males on both forms of disordered eating behaviours – restrained eating and emotional eating. While there is some literature to suggest that males and females do not differ significantly on emotional forms of eating (i.e., binge eating; binge-purge behaviours; McCabe & Vincent, 2003), findings from the study are consistent with an abundance of research which has found eating pathology to

be more prevalent among females (APA, 2000; Field, Colditz, & Peterson, 1997; Elgin & Pritchard, 2006; Keel, Fulkerson, & Leon, 1997; National Eating Disorders Association, 2008; van Hoeken et al., 2003). With respect to the family functioning variables, females and males scored similarly on family cohesion subscale for each family functioning type (disengaged, mid-range, and enmeshed). Likewise, there were no gender differences on scores of family adaptability subscale for each family functioning type (rigid, mid-range, and chaotic). As for individual difference factors, perfectionism scores and externalized self-perception scores in the current study were comparable for males and females. The family functioning variables and individual difference factors considered in this study have been associated with eating pathology in previous studies (Bardone-Cone et al., 2009; Hodges et al., 1998; Norwood et al., 2011; Pratt et al., 2001; Vidovic et al., 2005; Zaitsoff et al., 2002). The finding that females and males did not differ significantly on these variables but differed significantly on disordered eating behaviours suggests that there are other risk factors which are exclusive to females. Another possibility is that the risk factors considered in this study interact with gender. That is, gender could be a moderating variable that strengthens the relationship between the risk factors and disordered eating behaviours for females. In the next section, gender differences from the main analyses are discussed.

Perceived Family Enmeshment & Restrained Eating. For males, regression analyses indicated that perceived family enmeshment was significantly and positively predictive of restrained eating after controlling for parental education, ethnicity, BMI, perfectionism and externalized self-perception. This finding is supported by previous research which has associated higher levels of family cohesion with eating pathology among females in a non-clinical sample (Holston & Cashwell, 2000). Since very few studies which have investigated the relationship

between family functioning and eating pathology have included males, and given that there do not appear to be any studies which have linked family functioning to restrained eating among males, it is difficult to make comparisons to other research. However, after the interpretation of results for females pertaining to perceived family enmeshment and restrained eating, reasons for the observed gender differences in this hypothesis will be speculated upon.

For females, contrary to what was expected based on previous research which has implicated perceived family enmeshment with restrained eating (Minuchin et al., 1978; Kog & Vandereycken, 1989), family enmeshment was not a significant predictor of restrained eating. However, the difference in the findings is not entirely surprising given that family enmeshment has been related to restrained eating primarily in clinical samples of adult females as opposed to female adolescents in community-based samples. The inclusion of a clinical sample, where females might perceive their families as falling on the extreme ends of family cohesion, could have rendered findings that were consistent with the hypothesis that perceived family enmeshment predicts restrained eating.

The gender difference observed in this hypothesis may be explained by the argument that despite males' need for bonding with their parents, females' need for bonding far exceeds that of males' (Fischer, Munsch, & Greene, 1996). Based on this argument, as well as the fact that adolescence is a time for increased independence (Cohen, 1980; Noller & Callan, 1991), the extreme family closeness (i.e., enmeshment) that males perceive may result in feelings of frustration. Bruch (1982) argued that individuals who struggle with restrained forms of eating are not adequately prepared to assert themselves outside the confines of family. In the current study, it could be that males who perceive their families as being enmeshed feel overwhelmed by decisions that are constantly being made on their behalf. Male adolescents may feel that by

controlling their eating habits through restrained eating, they are exercising some form of meaningful decision-making.

On the other hand, given females' propensity for strong family bonding (Fischer et al., 1996), they may view family enmeshment as a positive factor, which results in less restrictive eating. This is supported by researchers who argue that families that display tight bonds and close boundaries are viewed as being adaptive rather than maladaptive (Green, Harris, Forte, & Robinson, 1991). Based on the negative regression coefficient for the effect of perceived family enmeshment on restrained eating ($\beta = -.08, p < .10$), it appears that perceived family enmeshment may be more of a protective rather than risk factor for eating pathology among female adolescents. Future research is strongly encouraged to examine the underlying mechanisms involved in the gender difference in perceived family enmeshment and restrained eating.

Perceived Family Rigidity & Emotional Eating. Another important gender difference observed in the study is with respect to perceived family rigidity (i.e., low family adaptability) as a predictor of emotional eating. For females only, perceived family rigidity emerged as a significant and positive predictor of emotional eating. While this significant finding for females is in accordance with what was hypothesized in the present study and is supported by previous research (Humphrey, 1989; Vidovic et al., 2005), the gender differences are contradictory to findings from a study by Kagan and Squires (1985) which revealed that family rigidity was associated with compulsive eating for males, but not for females. However, differences in sample demographics and methodology should be noted. Kagan and Squires' (1985) study, for example, included substantially fewer ($N = 300$) and older (i.e., $M_{age} = 21.12$ years) participants compared to participants in the current study ($N = 2518$; $M_{age} = 14.04$). Additionally, participants' age was not controlled for in Kagan and Squires' (1985) study. Other than this study, there do not appear

to be any recent studies that examined perceived family adaptability and eating pathology among males, making comparisons difficult.

With respect to the finding that family rigidity (i.e., low family adaptability) was a significant predictor of emotional eating for females only, it is difficult to speculate on reasons for this gender difference. Research in the area of family adaptability and emotional eating, especially for males, is currently very limited. However, this finding might be explained by gender differences in overprotectiveness. That is, since parents have been described as being overprotective and overly concerned with their daughters (Minuchin et al., 1978; Shoebridge & Gowers, 2000), perhaps female adolescents view this as a form of family rigidity. When female adolescents perceive their families as being rigid, this may lead to conflict within the family. In fact, high levels of familial conflict have been reported in families which include a child who struggles with emotional forms of eating (Garner et al., 1985; Johnson & Flach, 1985). It is argued that, in the absence of positive family interaction that can create self-confidence and mutual understanding for daughters with bulimia nervosa, daughters will often turn to unproductive, usually harmful alternatives, most commonly food (Humphrey & Stern, 1988). Future research into this finding is warranted.

Family Functioning and Emotional Eating, and Moderating Effects

Perceived Family Rigidity & Emotional Eating, Moderated by Perfectionism. As alluded to in the previous section, perceived family rigidity emerged as a significant and positive predictor of emotional eating for females. According to the Circumplex Model of Marital and Family Systems (Olson et al., 1979; 1983), family rigidity allows for limited or no possibility of family negotiation. Family rules are fixed and the roles of family members are unchanging. Given that adolescence is a time of dynamic change and often a desire for independence (Cohen,

1980; Noller & Callan, 1991), families that are unable to accommodate the adolescent's need for autonomy, will often incur problems. Researchers have stressed the fact that in order to increase the chance of maximum psychological development, parents must show flexibility in their parenting, to answer to their adolescent's increasing requirements for independence (Kobak & Ferenz-Gillies, 1995). As mentioned in the previous section, when female adolescents perceive their families as being rigid, which is often accompanied by increased levels of family conflict, female adolescents may engage in emotional forms of eating (Humphrey & Stern, 1988).

Perfectionism was included in the present study to examine a potential moderating role on the relationship between perceived family functioning and disordered eating behaviours. Findings from the study indicated that perfectionism significantly moderated the relationship between perceived family rigidity and emotional eating. In particular, the relationship was *strengthened* with increasing levels of perfectionism. At low levels of perfectionism (one SD below the mean) this main effect was absent, but at high levels of perfectionism (one SD above the mean) this main effect was present. This finding builds on previous work which has identified perceived family rigidity (Vidovic et al., 2005) and perfectionism (Castro et al., 2004; Nilsson et al., 2008) as important characteristics associated with eating pathology. It is possible that females who exhibit high levels of perfectionism are more likely to express frustration towards rigid forms of family functioning, and one form of expression could be emotional eating.

Perceived Family Disengagement & Emotional Eating, Moderated by Perfectionism and Externalized Self-Perception. Contrary to findings from clinical (Hodges et al., 1998; Ordman & Kirschenbaum, 1986) and non-clinical studies (Kagan & Squires, 1985), the present study revealed that perceived family disengagement (i.e., low family cohesion) did not appear to be predictive of emotional eating in adolescents. However, it was acknowledged that the current

study included a younger sample than previous studies. Given that adolescents spend a great deal of time with their peers and are considerably influenced by peer attitudes and behaviours (Coleman, 1980), they may be less cognizant, even disaffected by family disengagement. Further, since adolescence is a time of increasing independence (Cohen, 1980), family disengagement may actually be viewed favourably during this developmental stage. In this case, this may reduce an adolescents' risk to engage in maladaptive behaviours such as emotional eating. This supposition, however, requires future investigation.

Perfectionism was also included as a moderator in this analysis. Although family disengagement was not a significant predictor of emotional eating, this relationship was strengthened with increased levels of perfectionism. In fact, at low levels of perfectionism (one SD below the mean), family disengagement had a negative effect on emotional eating. Conversely, at high levels of perfectionism (one SD above the mean), family disengagement had a positive effect on emotional eating. This is the first known study to conduct a moderation analysis with respect to family disengagement and emotional eating, thus limiting the ability for comparisons. One possible explanation for the results could be that females who are perfectionists are more likely to be impacted by a disengaged family environment, prompting emotional eating behaviour as a possible escape mechanism. It may be that females who are perfectionists and live in a disengaged family tend to visualize what an "ideal family" should resemble, but because it falls short of their ideal, frustration is manifested in emotional eating.

Externalized self-perception was also included in the study to examine a potential moderating role on the relationship between perceived family functioning and disordered eating behaviours. Contrary to what was expected, externalized self-perception *weakened* the relationship between perceived family disengagement and emotional eating behaviours. There

are no previous studies that have examined externalized self-perception as a potential moderator on the relationship between perceived family disengagement and emotional eating, which limit comparisons. However, one possible explanation for the results may be that female adolescents who judge themselves according to others are more likely to be affected by their peers in school and less so by their family environment, thus attenuating the relationship between perceived family disengagement and emotional eating.

Significant Effects of Individual Difference Factors on Disordered Eating

Perfectionism. Although not addressed in the hypotheses, the finding that perfectionism emerged as a significant positive predictor of disordered eating behaviours for all male and female regression models in the present study deserves mention. This finding concurs with previous studies (Bardone- Cone et al., 2009; Pearson & Gleaves, 2006), which have identified perfectionism as an important risk factor for eating pathology among adolescents. However, this study extends previous research by including family functioning variables in the regression models. Perfectionism emerged as a significant predictor of disordered eating behaviours after controlling for perceived family functioning and socio-demographic variables, further confirming perfectionism as an important risk factor for disordered eating behaviours. Individuals who struggle with eating pathology often describe a sense of defeat when they feel faced with the pressure of meeting others' expectations, with what responsibility they have been given, and with the dreaded sense of failure they will experience if something goes awry. Unreasonable personal expectations can lead that individual to use food as a means of dismissing personal deficits (Shafran et al., 2002; Vitousek & Hollon, 1990). Specifically, with respect to *restrained eating*, females who prescribe to maladaptive perfectionist standards have been found to express difficulty meeting the demands of adolescence, which include adapting to a new body

weight and shape (Tyrka et al., 2002). Perfectionists may also be more attuned to media messages promoting 'ideal' body images, which they feel a need to adopt.

Externalized Self-Perception. Also not addressed in the hypotheses, but an important finding of the study was that externalized self-perception emerged as a significant and positive predictor of disordered eating behaviours for adolescents. Contrary to the extensive amount of research that has been devoted to perfectionism, externalized self-perception has not received as much attention in the eating pathology literature. There are a limited number of studies which have examined externalized self-perception as a risk factor for eating pathology among females (Lieberman et al., 2001; Norwood et al., 2011), and there do not appear to be any which have investigated this for males. By including externalized self-perception as a possible predictor of disordered eating behaviours for both males and females, this allowed for the possible identification of an additional risk factor for male adolescents. Given that the majority of studies concerning risk factors for eating pathology have been focused on females (McVey et al., 2002; Stice, Presnell, & Spangler, 2002), identifying risk factors for males could assist in the development of prevention and treatment programs. This is important in light of research that indicates an increasing prevalence of disordered eating behaviours among males (Croll et al., 2002; Dominé, Berchtold, Arké, Michaud, & Suris, 2009; Robles, 2010). Findings from the study indicated that, in the restrained eating and emotional eating regression models for males, externalized self-perception had the largest unique contribution (among the variables studied) to restrained eating ($sr^2 = .04$) and emotional eating ($sr^2 = .05$). For females, the corresponding unique contributions were ($sr^2 = .03$) for restrained eating and ($sr^2 = .08$) for emotional eating. Like males, externalized self-perception had the largest unique contribution to disordered eating behaviours. This finding for females corroborated with results from Norwood et al.'s (2011)

study, which identified externalized self-perception as an important factor in disordered eating behaviours. Moreover, this study extended this finding for male adolescents. The finding that revealed externalized self-perception as being the most important determinant of disordered eating behaviours for males could be explained by the fact that since males are traditionally less affected by societal norms of body image (McCabe & Ricciardelli, 2001; McCabe & Vincent, 2003), they form a judgement of themselves based on their peers' opinions.

Implications

The present study contributes valuable information to aid in the development of prevention and treatment of disordered eating behaviours for adolescents. With respect to program design, findings from the present study suggest that when developing programs, researchers may be best to focus on factors associated with family enmeshment to target restrained eating among male adolescents and family rigidity as a means of targeting emotional eating among female adolescents. Being aware of specific family functioning styles that are implicated in disordered eating behaviours can be of importance to family therapists. For example, family therapy could be employed as a schema for altering maladaptive forms of family functioning (Olson & Gorall, 2003). Learning and practicing healthier familial interactions may encourage family stability. For families seeking treatment of restrained eating for a male adolescent, the focus could be placed on factors related to family cohesion (Olson & Gorall, 2003) such as emotional bonding, unspoken boundaries, the use of time and space, and familial interests. Whereas, for families seeking treatment of emotional eating for a female adolescent, the focus may be best suited on factors related to family adaptability (Olson & Gorall, 2003) such as, leadership roles, as well as changes in the ways family members relate to one another and changes in the rules that govern the ways that family members interact.

Findings from the study suggest that perfectionism is a significant positive predictor for disordered eating behaviours among both male and female adolescents. Additionally, high levels of perfectionism enhanced female adolescents' risk of engaging in emotional eating if they perceive their families as disengaged or rigid. Individuals who struggle with eating pathology have been found to exhibit maladaptive forms of perfectionism (Pearson & Gleaves, 2006; Terry-Short et al., 1995). Characteristics of maladaptive perfectionism can include fear of being judged by others and heightened self-criticism (Flett & Hewitt, 1991; Frost et al., 1990; Rice & Ashby, 2007). While it may be of interest to focus on ways to eradicate tendencies toward perfectionism, there is research to suggest that perfectionism is a relatively stable trait (Rice & Aldea, 2006). This is supported by a study which demonstrated that, upon completion of a treatment program, levels of perfectionism among individuals with anorexia nervosa remained elevated (Bastiani et al., 1995; Nilsson et al., 2008; Sullivan, Bulik, Fear, & Pickering, 1998). Therefore, instead of programs focusing on the modification of level of perfectionism as a whole, it may be more productive to focus on strategies that diminish maladaptive components of perfectionism. Specifically, programs targeting eating pathology may be enhanced by educating adolescents to focus on promoting individuality and the acceptance of making mistakes as a positive learning experience. Diminishing maladaptive components of perfectionism could potentially reduce an adolescent's risk for engaging in disordered eating behaviours.

Lastly, the finding that externalized self-perception emerged as a significant and positive predictor for restrained and emotional eating among adolescents may have important implications for prevention and treatment programs. Programs may also be enhanced by adding a component on externalized self-perception. Individuals could be encouraged to view themselves according to their own personal standards that far outweigh the perceptions and

feelings of others. This may decrease adolescents' risk for engaging in restrained and emotional eating.

Limitations & Future Research

While this study does contribute important findings to the literature, several limitations of the study deserve mention. One such limitation was the use of a convenience sample, which included participants from schools in the Ottawa region, and is therefore not nationally representative of Canadian adolescents. Thus, it is quite possible that the findings rendered by this study could be either more or less pronounced in other Canadian samples. Specifically, the sample was not very ethnically diverse. Additionally, participants reported a high level of parental education (i.e., 89.1% of parents with college or university education), which suggests a fairly high socioeconomic status, on average. Therefore, findings may not be generalizable to populations in different regions and socio-economic strata. A future study may benefit by including schools from different regions to permit a more ethnically and racially diverse sample. This would result in a more representative sample and expand the generalizability of the study's results.

A second limitation was the cross-sectional nature of the study, which prevents one from inferring a causal association between family functioning and disordered eating behaviours. That is to say, while it is suspected that perceived family enmeshment contributes to restrained eating among males, other explanations should not be discounted. For example, it is possible that the mechanisms involved in restrained eating lead males to perceive their families as enmeshed. Similarly, while it is suspected that perceived family rigidity contributes to emotional eating among females, an alternative explanation could be that the mechanisms involved in emotional eating lead females to perceive their families as more rigid. It may be that a family is

perceived to be dysfunctional when it responds to an adolescent who is struggling with eating pathology. In a future study, it may be of interest to specifically study the bi-directional nature of the relationship between perceived family functioning and disordered eating behaviours.

Further, self-report questionnaires were used to assess the main variables in the current study, and therefore results of the present study are hindered by common method variance which is associated with using self-report measures. It should be noted that all self-report measures used in this study have strong psychometric properties which support their use and the validity of the findings from this study. It is also acknowledged that perception of family functioning can vary among its members, especially in families that include an individual who struggles with eating pathology (Ohannessian-McCauley, Lerner, Lerner, & von Eye, 2000; Vidovic et al., 2005). Also because adolescents are faced with becoming independent and responsible (Noller & Callan, 1991), it is possible that they perceive their families as being more rigid than they truly are. Thus, a future study may benefit by comparing responses to family functioning measures among family members (i.e., parents and siblings). This could provide a more accurate understanding of family functioning. Moreover, any large discrepancies found in family functioning may shed light on other factors which could be contributing to adolescents' disordered eating behaviours. Further, since researchers have suggested deficiencies with the Family Adaptability and Cohesion Scales in capturing extreme levels of family functioning (Green et al., 1991; Rowa, Kerig, & Geller, 2001) perhaps future studies could examine perceived family functioning using other instruments such as the FACES IV (Olson, Gorall, & Tiesel, 2002), which has been found to be more appropriate for capturing extreme forms of family functioning (Olson & Gorall, 2003).

Because this was the first known research to include a community sample of male and female adolescents to examine specific family functioning variables as predictors of restrained and emotional eating behaviours, while controlling for specific socio-demographic variables, males and females were analyzed separately. The majority of research on eating pathology has typically included females exclusively. Given the observed gender differences in disordered eating from studies which have examined males and females (Elgin & Pritchard, 2006; Robles, 2010), the present study examined males and females separately to better understand gender-specific familial and individual difference risk-factors for eating pathology. Findings from the present study indicated that there were gender-specific differences with respect to perceived family functioning and disordered eating behaviours. For example, perceived family enmeshment emerged as a significant predictor of restrained eating for males, but not for females. Conversely, perceived family rigidity significantly predicted emotional eating for females, but not for males. A future study, however, could conduct the analyses without splitting the data by gender. Instead, gender could be included in the model as a control variable, as well as a moderating variable. This would result in an increase in statistical power, thereby allowing the identification of potentially more significant effects. Moreover, this would allow researchers to compare gender differences directly.

Further, given that there are a large number of risk factors that may influence the relationship between family functioning and disordered eating behaviours, it may be viewed as a limitation that only two moderating variables were considered in the present study. Including only two moderating variables was motivated by the fact that there does not appear to be any research examining potential moderating variables on the relationship between family functioning and eating pathology. Future work in this area may benefit by including other

moderating variables. Since this study examined “risk-models” for disordered eating behaviours, perhaps a further study could examine “protective models”, including moderating variables such as social support, which has been found to have a positive influence on the health of individuals who are experiencing psychological distress (Dalgard, Bjork, & Tambs, 1995). As previously mentioned, since adolescents spend many of their waking hours with peers and are considerably influenced by their peers’ attitudes and behaviours (Coleman, 1980), it may be of interest for future studies to specifically examine the role of *perceived peer social support* in the relationship between perceived family functioning and eating pathology. Currently, research in this area appears to be quite limited. Finally, future research may also benefit by examining perceived family functioning (i.e., cohesion and adaptability) as a moderating variable on the relationship between eating pathology and its risk factors. Family functioning could be examined in the eating pathology literature in the context of both risk and protective models.

A final limitation which deserves mention is with respect to the small effect sizes of the family functioning variables that were observed in the current study. It is quite possible that these significant effects would not have been present in a smaller sample. Thus, while the study revealed several statistically significant findings, it is important to consider that these findings may not be clinically significant.

Conclusion

In spite of these limitations and the need for future research, this study provided new research into the relationship between perceived family functioning and disordered eating behaviours. Since it appears that moderation analyses have not been conducted in studying this relationship, the study adds to the literature by investigating how known risk factors for eating pathology moderated this relationship. Moreover, this research examined the effect of perceived

family functioning on disordered eating behaviours among both male and female adolescents. There has been a limited amount of research on this topic for adolescents, specifically for male adolescents. This is also the first known study to relate specific forms of family functioning to distinct types of disordered eating behaviours (i.e., restrained eating and emotional eating), while controlling for socio-demographic variables in adolescent sample.

Results from the study suggest that, overall, perceived family functioning did not appear to play a strong role in the development of disordered eating behaviours among males. One noteworthy finding, however, was that perceived family enmeshment emerged as a significant positive predictor of restrained eating among males, after certain socio-demographic and individual difference factors were controlled for.

Among females, perceived family functioning was an important risk factor for emotional eating only. Specifically, perceived family rigidity was found to be a significant positive predictor of emotional eating. Moreover, this relationship was significantly *strengthened* by high levels of perfectionism. While perceived family disengagement did not significantly predict emotional eating among females, perfectionism *strengthened* this relationship. Conversely, externalized self-perception *weakened* this relationship among females.

Finally, perfectionism and externalized self-perception were identified as significant and positive predictors of disordered eating behaviours for both males and females. Although further research is warranted to examine the underlying mechanisms for the moderating effects and the gender differences observed in the current study, identifying forms of family functioning (albeit perceived) and individual difference factors that heightens an adolescent's risk of engaging in disordered eating behaviours can inform effective prevention and treatment programs.

References

- Agency for Healthcare Research and Quality (2009). Eating disorders sending more Americans to the hospital. Retrieved from <http://www.ahrq.gov/news/nn/nn040109.htm>.
- Amato, P. R., & Rezac, S. J. (1994). Contact with nonresident parents, interparental conflict, and childrens' behaviour. *Journal of Family Issues, 15*, 191-207.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.). Washington DC: APA.
- Annus, A. M., Smith, G. T., Fischer, S., Hendricks, M., & Williams, S. F. (2007). Associations among family-of-origin food-related experiences, expectancies, and disordered eating. *International Journal of Eating Disorders, 40*, 179-186.
- Attie, I., & Brooks-Gunn, J. (1989). Development of eating problems in adolescent girls: A longitudinal study. *Developmental Psychology, 25*, 70-79.
- Bandura, A. (1977). *Social Learning Theory*. New York: General Learning Press.
- Barber, B. K., Olsen, J. E., & Shagle, S. C. (1994). Association between parental psychological and behavioural control and youth internalized and externalized behaviours. *Child Development, 65*, 1120-1136.
- Bardone-Cone, A. M., Weishuhn, A. S., & Boyd, C. A. (2009). Perfectionism and bulimic symptoms in African American college women: Dimensions of perfectionism and their interactions with perceived weight status. *Journal of Counseling Psychology, 56*, 266-275.
- Barker, E. T., & Galambos, N. L. (2003). Body dissatisfaction of adolescent girls and boys: risk and resource factors. *Journal of Early Adolescence, 23*, 141-165.

- Bastiani, A. M., Rao, R., Weltzin, T., & Kaye, W. H. (1995). Perfectionism in anorexia nervosa. *International Journal of Eating Disorders, 17*, 147-152.
- Beals, K. A. (2004). *Disordered Eating Among Athletes: A Comprehensive Guide for Health Professionals*. Human Kinetics: Champaign, IL.
- Benjamin, L. S. (1974). Structural analysis of social behaviour. *Psychological Review, 81*, 392-425.
- Benninghoven, D., Schneider, H., Strack, M., Reich, G., & Ceirpka, M. (2003). Family representations in relationship episodes of patients with a diagnosis of bulimia nervosa. *Psychology and Psychotherapy, 76*, 323-336.
- Berkman, N. D., Lohr, K. N., & Bulik, C. M. (2007). Outcomes of eating disorders: A systematic review of the literature. *International Journal of Eating Disorders, 40*, 293-309.
- Brannan, M. E., & Petrie, T. A. (2008). Moderators of the body dissatisfaction-eating disorder symptomatology relationship: Replication and extension. *Journal of Counseling Psychology, 55*, 263-275.
- Bruch, H. (1982). Anorexia nervosa: Therapy and theory. *American Journal of Psychiatry, 139*, 1531-1538.
- Buchholz, A., Henderson, K. A., Hounsell, P. A., Wagner, A., Norris, M., & Spettigue, M. W. (2007). Self-silencing in a clinical sample of female adolescents with eating disorders. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 16*, 158-163.
- Bulik, C. M., Tozzi, F., Anderson, C., Mazzeo, S. E., Aggen, S., & Sullivan, P. F. (2003). The relation between eating disorders and components of perfectionism. *American Journal of Psychiatry, 160*, 366-368.

- Burton, P., Smit, H. J., & Lightowler, H. J. (2007). The influence of restrained and external eating patterns on overeating. *Appetite, 49*, 191-197.
- Carlson, J., Sperry, L., & Lewis, J. A. (1997). *Family therapy : Ensuring treatment efficacy*. Pacific Grove : Brooks Cole.
- Castro, J., Gila, A., Gual, P., Lahortiga, F., Saura, B. & Toro, J. (2004). Perfectionism dimensions in children and adolescents with anorexia nervosa. *Journal of Adolescent Health, 35*, 392-398.
- Castro-Fornieles, J., Gual, P., Lahortiga, F., Gila, A., Casula, V., Fuhrmann, C.,...Toro, J. (2007). Self-oriented perfectionism in eating disorders. *International Journal of Eating Disorders, 40*, 562-568.
- Chamay-Weber, C., Narring, F., & Michaud, P. A. (2005). Partial eating disorders among adolescents: A review. *Journal of Adolescent Health, 37*, 417-427.
- Chao, Y. M., Pisetsky, E. M., Dierker, L. C., Dohm, F. A, Rosselli, F., May, A. M., & Striegel-Moore, R. H. (2008). Ethnic differences in weight control practices among U.S. adolescents from 1995-2005. *International Journal of Eating Disorders, 41*, 124-133.
- Cohen, J. (1980). Adolescent independence and Adolescent change. *Youth and Society, 12*, 107-124.
- Coleman, J. C. (1980). Friendship and the peer group in adolescence. In J. Adelson (Eds.), *Handbook of Adolescent Psychology*. (pp. 408-431). New York: John Wiley.
- Conger, A. J. (1974). A revised definition for suppressor variables: A guide to their identification and interpretation. *Educational Psychological Measurement, 34*, 35-46.
- Cook, L. C., & Kearney, C. A. (2009). Parent and youth perfectionism and internalizing psychopathology. *Personality and Individual Differences, 46*, 325-330.

- Cooley, E., Toray, T., Wang, M. C., & Valdez, N. N. (2008). Maternal effects on daughters' eating pathology and body image. *Eating Behaviours, 9*, 52-61.
- Coyne, J. C., & Anderson, B. J. (1989). The "psychosomatic family" reconsidered II: Recalling a defective model and looking ahead. *Journal of Marital and Family Therapy, 15*, 139-148.
- Croll, J., Neumark-Stzainer, D., Story, M., & Ireland, M. (2002). Prevalence and risk and protective factors related to disordered eating behaviours among adolescents: Relationship to gender and ethnicity. *Journal of Adolescent Health, 31*, 166-175.
- Crowther, J. H., Kichler, J. C., Sherwood, N. E., & Kuhnert, M. E. (2002). The role of familial factors in the etiology of bulimia nervosa. *Eating Disorders: The Journal of Treatment and Prevention, 10*, 141-151.
- Currin, L., Schmidt, U., Treasure, J., & Jick, H. (2005). Time trends in eating disorder incidence. *The British Journal of Psychiatry, 186*, 132-135.
- Dalgard, O. S., Bjork, S., & Tambs, K. (1995). Social support, negative life events and mental health. *British Journal of Psychiatry, 166*, 29-34.
- Dall, K., Levebvre, M., Pacey, M., & Sahai, V. (2006). Champlain LHIN: Socio-Economic Indicators Atlas. Government of Ontario, 26.
- Day, J., Schmidt, U., Collier, D., Perkins, S., Van den Eynde, F., Treasure, J.,...Eisler, I. (2011). Risk factors, correlates, and markers in early-onset bulimia nervosa and ednos. *International Journal of eating Disorders, 44*, 287-294.
- Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the Royal Statistical Society, 39*, 1-38.

- Dominé, F., Berchtold, A., Arké, C., Michaud, P., & Suris, J. (2009). Disordered eating behaviours: What about boys? *Journal of Adolescent Health, 44*, 111-117.
- Dour, H. J., & Theran, S. A. (2011). The interaction between the superhero ideal and maladaptive perfectionism as predictors of unhealthy eating attitudes and body esteem. *Body Image, 8*, 93-96.
- Elgin, J., & Pritchard, M. (2006). Gender differences in disordered eating and its correlates. *Eating and Weight Disorders, 11*, 96-101.
- Fairburn, C. G., & Bohn K. (2005). Eating disorder NOS (EDNOS): an example of the troublesome “not otherwise specified” (NOS) category in DSM-IV. *Behaviour Research and Therapy, 43*, 691-701.
- Fairburn, C. G., & Cooper, P. J. (1984). The clinical features of bulimia nervosa. *British Journal of Psychiatry, 144*, 238-246.
- Fairburn, C. G., & Harrison, P. J. (2003). Eating Disorders. *The Lancet, 361*, 407-416.
- Felker, K. R., & Stivers, C. (1994). The relationship of gender and family environment to eating disorder risk in adolescents. *Adolescence, 29*, 821-834.
- Field, A. E., Camargo, C. A. JR., Taylor, C. B., Berkey, C. S., Frazier, A. L., Gillman, M. W., & Colditz, G. A. (1999). Overweight, weight concerns, and bulimic behaviours among girls and boys. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 754-760.
- Field, A. E., Colditz, G. A., & Peterson, K. E. (1997). Racial/ethnic and gender differences in concern with weight and in bulimic behaviours among adolescents. *Obesity Research, 5*, 447-454.

- Fischer, J. L., Munsch, J., & Greene, S. M. (1996). Adolescence and intimacy. In G. R. Adams, R. Montemayor, & T. P. Gullotta (Eds.), *Psychosocial development during adolescence*. (pp. 95-129). California: Sage Publications.
- Flett, G. L., Hewitt, P. L., Oliver, J. M., & Macdonald, S. (2002). Perfectionism in children and their parents: a developmental analysis. In G. L. Flett, & P. L. Hewitt (Eds.), *Perfectionism: Theory, research and treatment* (pp.89-132). Washington DC: American Psychological Association.
- Forbush, K., Heatherton, T. F., & Keel, P. K. (2007). Relationships between perfectionism and specific disordered eating behaviours. *International Journal of Eating Disorders, 40*, 37-41.
- Forman-Hoffman, V. (2004). High prevalence of abnormal eating and weight control practices among U.S. high-school students. *Eating Behaviours, 5*, 325-336.
- Frank, J. B., & Thomas, C. D. (2003). Externalized self-perceptions, self-silencing, and the prediction of eating pathology. *Canadian Journal of Behavioural Science, 35*, 219-228.
- Franko, D. L., Thompson, D., Affenito, S. G., Barton, B. A., & Striegel-Moore, R. H. (2008). What mediates the relationship between family meals and adolescent health issues? *Health Psychology, 27*, 109-117.
- French, S. A., Perry, C. L., Leon, G. R., & Fulkerson, J. A. (1995). Dieting behaviours and weight change history in female adolescents. *Health Psychology, 6*, 548-555.
- French, S. A., Story, M., Neumark-Sztainer, D., Downes, B., Resnick, M., & Blum, R. (1997). Ethnic differences in psychosocial and health behaviour correlates of dieting, purging, and binge eating in a population-based sample of adolescent females. *International Journal of Eating Disorders, 22*, 315-322.

- Frost, R. O., Lahart, C. M., & Rosenblate, R. (1991). The development of perfectionism: A study of daughters and their parents. *Cognitive Therapy and Research, 15*, 469-489.
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.
- Garner, D. M., Garfinkel, P. E., & O'shaughnessy, M. (1985). The validity of the distinction between bulimia with and without anorexia nervosa. *American Journal of Psychiatry, 142*, 581-587.
- Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia and bulimia. *International Journal of Eating Disorders, 2*, 15-24.
- Goldfield, G. S., Murray, M., Buchholz, A., Henderson, K., Obeid, N., Kukaswadia, A., & Flament, M. F. (2011). Family meals and body mass index among adolescents: effects of gender. *Applied Physiology, Nutrition, and Metabolism, 36*, 539-546.
- Graber, J. A., Brooks-Gunn, J., Paikoff, R. L., & Warren, M. P. (1994). Prediction of eating problems: An eight year study of adolescent girls. *Developmental Psychology, 30*, 823-834.
- Green, R. G., Harris, R. N., Forte, J. A., & Robinson, M. (1991). Evaluating FACES III and the Circumplex Model: 2,440 families. *Family Process, 30*, 55-73.
- Grogan, S. (1999). *Body Image: Understanding Body Dissatisfaction in Men, Women and Children*. London: Routledge.
- Halvarsson, K., & Sjoden, P. O. (1998). Psychometric properties of the dutch eating behaviour questionnaire (DEBQ) among 9-10 year old swedish girls. *European Eating Disorders Review, 6*, 115-125.

- Herman, C. P., & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality, 43*, 647-660.
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*, 456-470.
- Hodges, E. L., Cochrane, C. E., & Brewerton, T. D. (1998). Family characteristics of binge-eating disorder patients. *International Journal of Eating Disorders, 23*, 145-151.
- Hoek, H. W., & van Hoeken, D. (2003). Review of the prevalence and incidence of eating disorders. *International Journal of Eating Disorders, 34*, 383-396.
- Holston, J. I., & Cashwell, C. S. (2000). Family functioning and eating disorders among college women: A model of prediction. *Journal of College Counseling, 3*, 5-16.
- Hsu, L. K. G. (1996). Epidemiology of the eating disorders. *Psychiatric Clinics of North America, 19*, 681-700.
- Humphrey, L. L. (1989). Observed family interactions among subtypes of eating disorders using structural analysis of social behaviour. *Journal of Consulting and Clinical Psychology, 57*, 206-214.
- Humphrey, L. L., & Stern, S. (1988). Object relations and the family system in bulimia: A theoretical integration. *Journal of Marital and Family Therapy, 14*, 337-350.
- Jack, D. C., & Dill, D. (1992). The silencing the self scale: Schemas of intimacy associated with depression in women. *Psychology of Women Quarterly, 16*, 97-106.
- Jacobi, C., Hayward, C., De Zwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: Application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin, 130*, 19-65.

- Johnson, C., & Flach, A. (1985). Family characteristics of 105 patients with bulimia. *American Journal of Psychiatry*, *142*, 1321-1324.
- Joiner, G. W., & Kashubeck, S. (1996). Acculturation, body image, self-esteem, and eating-disorder symptomatology in adolescent Mexican American women. *Psychology of Women Quarterly*, *20*, 419-435.
- Joiner, T. E. JR., Katz, J., & Heatherton, T. F. (2000). Personality features differentiate late adolescent females and males with chronic bulimic symptoms. *International Journal of Eating Disorders*, *27*, 191-197.
- Kagan, D. M., & Squires, R. L. (1985). Family cohesion, family adaptability, and eating behaviours among college students. *International Journal of Eating Disorders*, *4*, 267-279.
- Katzman, M. A., & Wolchik, S. A. (1984). Bulimia and binge eating in college women: A comparison of personality and behavioural characteristics. *Journal of Consulting and Clinical Psychology*, *52*, 423- 428.
- Keel, P. K., Fulkerson, J. A., & Leon, G. R. (1997). Disordered eating precursors in pre-and early adolescent girls and boys. *Journal of Youth and Adolescence*, *26*, 203-216.
- Keel, P. K., Haedt, A., & Edler, C. (2005). Purging disorder: An ominous variant of bulimia nervosa? *International Journal of Eating Disorders*, *38*, 191-199.
- Killen, J. D., Hayward, C., Litt, I., Hammer, L. D., Wilson, D. M., Miner, B.,...Shisslak, C. (1992). Is puberty a risk factor for eating disorders? *American Journal of Diseases in Children*, *146*, 323-325.

- Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Flemming, W. S., & Gamble, W. (1993). Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development, 64*, 231-245.
- Kobak, R., & Ferenz-Gillies, R. (1995). Emotion regulation and depressive symptoms during adolescence. *Development and Psychopathology, 7*, 183-192.
- Kog, E., & Vandereycken, W. (1989). Family interaction in eating disorder patients and normal controls. *International Journal of Eating Disorders, 8*, 11-23.
- Kraemer, H. C., Stice, E., Kazdin, A., Offord, D., & Kupfer, D. (2001). How do risk factors work together? Mediators, moderators, and independent, overlapping, and proxy risk factors. *American Journal of Psychiatry, 158*, 848-856.
- Leon, G. R., Fulkerson, J. A., Perry, C. L. & Dube, A. (1994). Family influences, school behaviours, and risk for the later development of an eating disorder. *Journal of Youth and Adolescence, 23*, 499-515.
- Lieberman, M., Gauvin, L., Bukowski, W. M., & White, D. R. (2001). Interpersonal influence and disordered eating behaviours in adolescent girls. The role of peer modeling, social reinforcement, and body-related teasing. *Eating Behaviours, 2*, 215-236.
- Lundholm, J. K., & Waters, J. E. (1991). Dysfunctional family systems: Relationship to disordered eating behaviours among university women. *Journal of Substance Abuse, 3*, 97-106.
- McCabe, M. P., & Ricciardelli, L. A. (2001). Parent, peer, and media influences on body image and strategies to both increase and decrease body size among adolescent boys and girls. *Adolescence, 36*, 225-240.

- McCabe, M. P., & Vincent, M. A. (2003). The role of biodevelopmental and psychological factors in disordered eating among adolescent males and females. *European Eating Disorders Review, 11*, 315-328.
- McVey, G. L., Pepler, D., Davis, R., Flett, G. L., & Abdolell, M. (2002). Risk and protective factors associated with disordered eating during early adolescence. *Journal of Early Adolescence, 22*, 75-95.
- Minuchin, S., Rosman, B. L., & Baker, L. (1978). *Psychosomatic families: Anorexia Nervosa in Context*. Cambridge, MA: Harvard University Press.
- Muise, A. M., Stein, D. G., & Arbess, G. (2003). Eating disorders in adolescent boys: A review of the adolescent and young adult literature. *Journal of Adolescent Health, 33*, 427-435.
- Mussell, M. P., Binford, R. B., & Fulkerson, J. A. (2000). Eating disorders: Summary of risk factors, prevention programming, and prevention research. *Counseling Psychologist, 28*, 764-796.
- National Eating Disorders Association. (2011). General eating disorders information. Retrieved from <http://www.nationaleatingdisorders.org>.
- National Eating Disorders Association. (2008). Common myths about eating disorders. Retrieved from <http://www.edap.org/uploads/file/toolkits/NEDA-TKP-A02-CommonMyths.pdf>
- Neumark-Sztainer, D., & Hannan, P. J. (2000). Weight-related behaviours among adolescent girls and boys: Results from a national survey. *Archives of Pediatrics & Adolescent Medicine, 154*, 569-577.

- Nilsson, K., Sundbom, E., & Hägglöf, B. (2008). A longitudinal study of perfectionism in adolescent onset anorexia nervosa-restricting type. *European Eating Disorders Review, 16*, 386-394.
- Noller, P., & Callan, V. J. (1991). *The adolescent in the family*. New York: Chapman and Hall.
- Norwood, S. J., Bowker, A., Buchholz, A., Henderson, K. A., Goldfield, G., & Flament, M. F. (2011). Self-silencing and anger regulation as predictors of disordered eating among adolescent females. *Eating Behaviours, 12*, 112-118.
- Norwood, S. J., Buchholz, A., Henderson, K., Flament, M. F., & Goldfield, G. (2007, June). *Validation of the self-silencing scale for adolescents*. Poster Presented at the Canadian Psychological Association 68th Annual Convention, Ottawa, ON.
- O'Dea, J., & Abraham, S. (2000). Improving the body image, eating attitudes, and behaviours of young male and female adolescents: A new educational approach that focuses on self-esteem. *International Journal of Eating Disorders, 28*, 43-57.
- Ohannessian-McCauley, C., Lerner, J. V., Lerner, R. M., & von Eye, A. (2000). Adolescent-parent discrepancies in perceptions of family functioning and early adolescent self-competence. *International Journal of Behavioural Development, 24*, 362-372.
- Olson, D. H., & Gorall, D. M. (2003). Circumplex model of marital and family systems. In F. Walsh (Eds.), *Normal Family Processes* (3rd ed.) (pp. 514-547). New York: Guilford.
- Olson, D. H., Gorall, D., & Tiesel, J. (2002). *Family inventories package*. Minneapolis: Life Innovations.
- Olson, D. H., Russell, C. S., & Sprenkle, D. H. (1983). Circumplex model of martial and family systems: VI. Theoretical update. *Family Process, 22*, 69-83.

- Olson, D. H., Sprenkle, D. H., & Russell, C. S. (1979). Circumplex model of marital and family systems: I. Cohesion and adaptability dimensions, family types, and clinical applications. *Family Process, 18*, 3-28.
- Olson, D. H., Portner, J., Bell, B. (1982). *FACES II: Family Adaptability and Cohesion Evaluation Scales*. St. Paul, MN: Family Social Science, University of Minnesota.
- Ordman, A. M., & Kirschenbaum, D.S. (1986). Bulimia: Assessment of eating, psychological adjustment, and familial characteristics. *International Journal of Eating Disorders, 5*, 865-878.
- Patton, G. C., Coffey, C., & Sawyer, S. M. (2003). The outcome of adolescent eating disorders: Findings from the victorian adolescent health cohort study. *European Child and Adolescent Psychiatry, 12*, 25-29.
- Pearson, C. A., & Gleaves, D. H. (2006). The multiple dimensions of perfectionism and their relation with eating disorder features. *Personality and Individual Differences, 41*, 225-235.
- Phelps, L., & Bajorek, E. (1991). Eating disorders of the adolescent: Current issues in etiology, assessment, and treatment. *School Psychology Review, 20*, 9-22.
- Phelps, L., Johnston, L. S., & Augustyniak, K. (1999). Prevention of eating disorders: Identification of predictor variables. *Eating Disorders: The Journal of Treatment & Prevention, 7*, 99-108.
- Pratt, E. M., Telch, C. F., Labouvie, E. W., Wilson, G. T., & Agras, W. S. (2001). Perfectionism in women with binge eating disorder. *International Journal of Eating Disorders, 29*, 177-186.

- Presnell, K., Bearman, S. K., & Stice, E. (2004). Risk factors for body dissatisfaction in adolescent boys and girls: A prospective study. *International Journal of Eating Disorders, 36*, 389-401.
- Pyle, R. L., Mitchell, J. E., & Eckert, E. D. (1981). Bulimia: A report of 34 cases. *Journal of Clinical Psychiatry, 42*, 60-64.
- Ramacciotti, C. E., Coli, E., Bondi, E., Burgalassi, A., Massimetti, G., & Dell'Osso, L. (2008). Shared psychopathology in obese subjects with and without binge-eating disorder. *International Journal of Eating Disorders, 41*, 643-649.
- Reijonen, J. H., Pratt, H. D., Patel, D. R., & Greydanus, D. E. (2003). Eating disorders in the adolescent population: An overview. *Journal of Adolescent Research, 18*, 209-222.
- Rice, K. G., & Aldea, M. A. (2006). State dependence and trait stability of perfectionism: A short-term longitudinal study. *Journal of Counseling Psychology, 53*, 205-212.
- Rice, K. G., & Ashby, J. S. (2007). An efficient method for classifying perfectionists. *Journal of Counseling Psychology, 54*, 72-85.
- Rieder, S., & Ruderman, A. (2001). Cognitive factors associated with binge and purge eating behaviours: The interaction of body dissatisfaction and body image importance. *Cognitive Therapy and Research, 25*, 801-812.
- Rierdan, J., & Koff, E. (1997). Weight, weight-related aspects of body image, and depression in early adolescent girls. *Adolescence, 32*, 615-624.
- Robles, D. S. (2010). Assessing eating disorders: Gender as moderator of factors of eating attitudes. *The Assessment Handbook, 4*, 38-47.
- Rome, E. S., & Ammerman, S. (2003). Medical complications of eating disorders: An update. *Journal of Adolescent Health, 33*, 418-426.

- Rosen, D. S. (2003). Eating disorders in children and young adolescents: Etiology, classification, clinical features, and treatment. *Adolescent Medicine, 14*, 49-59.
- Ross, M., & Wade, T. D. (2004). Shape and weight concern and self-esteem as mediators of externalized self-perception, dietary restraint and uncontrolled eating. *European Eating Disorders Review, 12*, 129-136.
- Rowa, K., Kerig, P. K., & Geller, J. (2001). The family and anorexia nervosa: Examining parent-child boundary problems. *European Eating Disorders Review, 6*, 97-114.
- Shafran, R., Cooper, Z., & Fairburn, C. G. (2002). Clinical perfectionism: A cognitive-behavioural analysis. *Behaviour Research and Therapy, 40*, 773-791.
- Shields, M. (2005). *Measured obesity: Overweight Canadian children and adolescents*. Statistics Canada, Catalogue 82-620-MWE2005001
- Shisslak, C. M., Crago, M., & Estes, L. S. (1995). The spectrum of eating disturbances. *International Journal of Eating Disorders, 18*, 209-219.
- Shoebridge, P., & Gowers, S. G. (2000). Parental high concern and adolescent-onset anorexia nervosa. *British Journal of Psychiatry, 176*, 132-137.
- Sights, J. R., & Richards, H. C. (1984). Parents of bulimic women. *International Journal of Eating Disorders, 3*, 3-13.
- Sippola, L., & Bukowski, W. M. (1996). *Relational authenticity in adolescence: Associations between "voice", friendship and adolescent adjustment*. Unpublished Manuscript, Concordia University, Montreal, QC.
- Slaney, R. B., & Ashby, J. S. (1996). Perfectionists: Study of a criterion group. *Journal of Counseling and Development, 74*, 393-398.

Sorotzkin, B. (1998). Understanding and treating perfectionism in religious adolescents.

Psychotherapy: Theory, Research, Practice, Training, 35, 87-95.

Steiner, H., & Lock, J. (1998). Anorexia nervosa and bulimia nervosa in children and

adolescents: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37, 352-359.

Stice, E. (1999). Clinical implications of psychosocial research on bulimia nervosa and

binge-eating disorder. *Journal of Clinical Psychology*, 55, 675-683.

Stice, E., Killen, J. D., Hayward, C., & Taylor, C. B. (1998). Support for the continuity

hypothesis of bulimic pathology. *Journal of Consulting and Clinical Psychology*, 66, 784-790.

Stice, E., Presnell, K., & Spangler, D. (2002). Risk factors for binge eating onset in adolescent

girls: A 2-year prospective investigation. *Health Psychology*, 21, 131-138.

Striegel-Moore, R. H., & Bulik, C. M. (2007). Risk factors for eating disorders. *American*

Psychologist, 62, 181-198.

Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1993). The social self in bulimia nervosa:

Public self-consciousness, social anxiety, and perceived fraudulence. *Journal of Abnormal Psychology*, 102, 297-303.

Strober, M. (1981). The significance of bulimia in juvenile anorexia nervosa: An exploration of

possible etiologic factors. *International Journal of Eating Disorders*, 1, 28-43.

Strober, M., Freeman, R., & Morrell, W. (1997). The long-term course of severe anorexia

nervosa in adolescents: Survival analysis of recovery, relapse, and outcome predictors over 10-15 years in a prospective study. *International Journal of Eating Disorders*, 22, 339-360.

- Suddarth, B., & Slaney, R. G. (2001). An investigation of the dimensions of perfectionism in college students. *Measurement and Evaluation in Counseling and Development, 34*, 157-165.
- Sullivan, P. F. (1995). Mortality in anorexia nervosa. *American Journal of Psychiatry, 152*, 1073-1074.
- Sullivan, P. F., Bulik, C. M., Fear, J. L., & Pickering, A. (1998). Outcome of anorexia nervosa: A case-control study. *American Journal of Psychiatry, 155*, 939-946.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Boston: Allyn and Bacon.
- Tachi, T. (1999). Family environment in eating disorders: A study of the familiar factors influencing the onset and course of eating disorders. Retrieved March 16, 2011 from NATIONAL LIBRARY OF MEDICINE (PubMed) on the World Wide Web: <http://www.ncbi.nlm.nih.gov/pubmed/10434760>
- Terry-Short, L. A., Owens, R. G., Slade, P. D., & Dewey, M. E. (1995). Positive and negative perfectionism. *Personality and Individual Differences, 18*, 663-668.
- Thelen, M. H., & Cormier, J. F. (1995). Desire to be thinner and weight control among children and their parents. *Behaviour Therapy, 26*, 85-99.
- The Mcknight Investigators (2003). Risk factors for the onset of eating disorders in adolescent girls: Results of the Mcknight longitudinal risk factor study. *American Journal of Psychiatry, 160*, 248-254.
- Turner, R. A., Irwin, C. E., Tschann, J. M., & Millstein, S. G. (1993). Autonomy, relatedness, and the initiation of health risk behaviours in early adolescence. *Health Psychology, 12*, 200-208.

- Tylka, T. L., & Subich, L. M. (2004). Examining a multidimensional model of eating disorder symptomatology among college women. *Journal of Counseling psychology, 51*, 314-328.
- Tyrka, A. R., Waldron, I., Graber, J. A., & Brooks-Gunn, J. (2002). Prospective predictors of the onset of anorexic and bulimic syndromes. *International Journal of Eating Disorders, 32*, 282-290.
- U. S. Department of Health and Human Services (2008). Binge Eating Disorder. Retrieved from <http://win.niddk.nih.gov/publications/binge.htm#complications>
- van Hoeken, D., Seidell, J. C., & Hoek, H. W. (2003). Epidemiology. In J. L. Treasure, U. Schmidt, & E. F. van Furth (Eds.), *Handbook of eating disorders* (pp. 11-34). Chichester: Wiley.
- Van Strien, T., Frijters, J. E., Bergers, G. P., & Defares, P. B. (1986). The dutch eating behaviour questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behaviour. *International Journal of Eating Disorders, 5*, 295-315.
- Vidovic, V., Jureša, V., Begovac, I., Mahnik, M., & Tocilj, G. (2005). Perceived family cohesion, adaptability and communication in eating disorders. *European Eating Disorders Review, 13*, 19-28.
- Vincent, M. A., & McCabe, M. P. (2000). Gender differences among adolescents in family, and peer influences on body dissatisfaction, weight loss, and binge eating behaviours. *Journal of Youth and Adolescence, 29*, 205-221.
- Vitousek, K. B., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Therapy and Research, 14*, 191-214.
- Wallin, U., & Hansson, K. (1999). Anorexia nervosa in teenagers: Patterns of family functioning. *Nordic Journal of Psychiatry, 53*, 29-35.

- Wang, S. S., & Brownell, K. D. (2005). Anorexia Nervosa. In C. B. Fisher, & R. M. Lerner (Eds.), *Encyclopedia of applied developmental science* (pp.83-85). Thousand Oaks: CA: Sage.
- Wang, S. S., Houshyar, S., & Prinstein, M. J. (2006). Adolescent girls' and boys' weight-related health behaviours and cognitions: Associations with reputation-and preference-based peer status. *Health Psychology, 25*, 658-663.
- Wardle, J. (1987). Eating style: A validation study of the dutch eating behaviour questionnaire in normal subjects and women with eating disorders. *Journal of Psychosomatic Research, 31*, 161-169.
- Whitaker, A. H. (1992). An epidemiological study of anorectic and bulimic symptoms in adolescent girls: Implications for pediatricians. *Pediatric Annals, 21*, 752-759.
- White, M. A., & Grilo, C. M. (2005). Ethnic differences in the prediction of eating and body image disturbances among female adolescent psychiatric inpatients. *International Journal of Eating Disorders, 38*, 78-84.
- Woodside, D. B., Bulik, C. M., Halmi, K. A., Fichter, M. M., Kaplan, A., & Berrettini, W. H. (2002). Personality, perfectionism, and attitudes toward eating in parents of individuals with eating disorders. *International Journal of Eating Disorders, 31*, 290-299.
- Zaitsoff, S. L., Geller, J., & Srikameswaran, S. (2002). Silencing the self and suppressed anger: Relationship to eating disorder symptoms in adolescent females. *European Eating Disorders Review, 10*, 51-60.

Appendix A: Consent and Assent Forms

Research on Eating and Adolescent Lifestyle
REAL Study
INFORMATION DOCUMENT FOR FOLLOW-UP

Research Team:

Dr. Martine Flament – Principal investigator – martine.flament@rohcg.on.ca; (613)722-6521 ext. 6801

Dr. Annick Buchholz – Co-investigator – buchholz@cheo.on.ca ; (613) 737-7600 ext. 2837

Dr. Katherine Henderson - Co-investigator – henderson_k@cheo.on.ca; (613) 737-7600 ext. 5895

Dr. Gary Goldfield – Co-investigator – ggoldfield@cheo.on.ca; (613) 737-7600 ext. 3288

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 Mental Health Centre (ROMHC) 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 how lifestyle plays a role in the development of healthy or unhealthy eating behaviours and body weight. In the end, we hope to understand how eating and weight disorders develop, and how to prevent them.

Since November of 2004, we have been collecting information from over 2,000 adolescents in grades 7 to 12 from the Ottawa-Carleton and surrounding regions. If you recall, your child completed a questionnaire that was administered during class time, which asked about things like eating habits, dieting, self-esteem, body image, personal and family lifestyle, feelings, emotions, and relationships with family and peers. At the time of the study last year, you and your child were asked whether you gave us permission to re-contact you in one year's time. We are grateful that you agreed to participate last year, and we hope you will choose to participate again this year. Students who choose to participate again in the study at their school will be included in a draw for the chance to win an iPod nano (1 iPod nano per 40 participants). Alternatively, the participating students may be offered a pizza party after or upon completion of the survey. If the adolescent completes the study at another location (i.e. the Royal Ottawa Mental Health Centre) due to the researchers being unable to perform the study in his/her school, he/she will be offered a reimbursement of \$20 as compensation for their time.

All the answers to the survey are confidential. Each questionnaire will be numbered and students will be asked not to write their name on it. No one besides the research team will have access to the information recorded, whether they are parents, teachers, or other students. The answers to the questionnaire will be kept in a secure place at the Royal Ottawa Mental Health Centre, and will be used for this research only. 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.

However, if any of the answers indicate that a student may be in serious danger (one of the following situations: wants to kill him/herself, possible depressive or eating disorder), a member of the research team will meet with your child for a brief and confidential assessment. If at that time the professional believes that further intervention is needed, they will contact a parent/guardian to ensure that the participant is provided with the proper environmental and/or professional support. Students will also be informed that in the event that they are experiencing any other problems, be it anxiety or general emotional problems, they should talk to someone like a parent, family doctor, or school personnel. The school has been provided with a list of mental health resources available for youth in the Ottawa area. 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. All data collected will be retained for 10 years post publication. This is a requirement of the Research Ethics Board of the Royal Ottawa Mental Health Centre.

The questionnaire will again be given to the students during class time, on a date that is convenient for their school. Students will complete it during a regular class period (approximately 50 to 70 minutes). After the questionnaire is completed, we will measure each student’s height and weight. This will be performed individually and confidentially in a private space. If for some reason we are unable to locate a specific student at their school, we will invite the participant, either via telephone or email, to complete the survey at a different location (i.e., at the Royal Ottawa Mental Health Centre). The participant will also be weighed and measured upon completion of the survey.

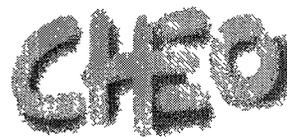
We ask parents and guardians to indicate if they want their child to participate in this study by signing a consent form. Students will also be given the choice to participate or not before the questionnaire package is distributed on the day of the study. Students can stop participating at any time, or refuse to answer any particular questions without penalty. Their decision will not affect their marks and will not appear on any school document.

We will again be asking permission to re-contact the students in a year’s time for another follow-up, in order to determine changes that may take place over time. In no way does consenting to be re-contacted now indicate your consent to participate in the study next year.

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 reviewed by the Research Ethics Boards of the ROMHC and CHEO. A Research Ethics Board consists of a group of people from scientific and non-scientific background that review research studies. Their goal is to ensure the rights and welfare of people involved in research are protected. The study has also been approved by the Ottawa-Carleton Research Advisory Committee, as well as the principal from your own school. For any questions about ethical considerations and the rights of participants, you may call the Chair of the ROMHC Research Ethics Board at (613) 722-6521 ext. 6226, or the 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. 6801.



Research on Eating and Adolescent Lifestyle
REAL Study

CONSENT FORM FOR PARENTS/GUARDIANS AT FOLLOW-UP

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 also understand that my permission is required in order for my child to participate.

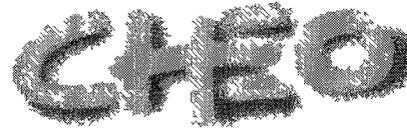
I know that a questionnaire will be administered in my child's classroom. It will contain certain questions of a personal nature on many aspects of his/her lifestyle like eating habits, dieting, self-esteem, body image, feelings, emotions, and relationships with family and peers. I have been assured that every effort will be made to minimize any discomfort that could be caused by certain 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, and will have to hand it in at the end of the period. A number will be assigned to each questionnaire, and my child will not be asked to write his/her name on any part of it. After the questionnaire is completed, a researcher will measure my child's height and weight individually in a private space. Participating students will be compensated for their time either in the form of a prize draw or a pizza party. If for some reason my child cannot complete the survey at his/her school, he/she will be invited either via telephone or email to complete it at a different location (i.e., at the Royal Ottawa Mental Health Centre), where he/she will also be weighed and measured, and be reimbursed for their time in the form of money.

I have been assured that all answers will remain confidential and that the completed questionnaires will be kept in a 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 of the following situations: wants to kill him/herself, possibly diagnosable depressive or eating disorder), a member of the research team will get in touch, individually and confidentially with him/her and assess the situation, to ensure that my child is provided with the proper environmental and/or professional support. I am aware that my child will be informed that he/she should speak with a parent, family physician, or school staff member if he/she is experiencing any anxiety-related or other emotional problems. 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. I understand that all data collected will be retained for 10 post publication, and that this is a requirement of the Research Ethics Board of the Royal Ottawa Mental Health Centre.

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. 6801.

Please turn over



_____ I authorize my child to participate in this study

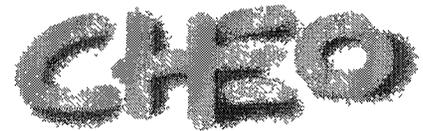
_____ I do not authorize my child to participate in this study

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: _____

Name of Investigator: _____ Signature: _____ Date: _____



Research on Eating and Adolescent Lifestyle
REAL Study

CONSENT FORM FOR PARENTS/GUARDIANS AT FOLLOW-UP
Permission for student to be re-contacted for the third phase of the study

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 may be re-contacted to participate in a follow-up study. I also understand that my permission would be required again in order for my child to participate in any further study.

I know that the investigator may re-contact my child via home phone number or my child's email address.

_____ I authorize my child to be possibly re-contacted for a follow-up study

_____ I do not authorize my child to be possibly re-contacted for a follow-up 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: _____

Home phone number: _____

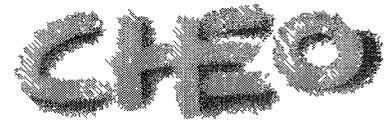
Work phone number: _____

Cell phone number: _____

Email address: _____

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

Name of Investigator: _____ Signature: _____ Date: _____



Research on Eating and Adolescent Lifestyle
REAL Study

ASSENT FORM FOR STUDENT AT FOLLOW-UP

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 also understand that in order for me to participate, my parent/guardian must give their permission.

I know that a questionnaire will be given out to all students who decided to participate. It will contain certain personal questions on many aspects of my lifestyle like eating habits, dieting, self-esteem, body image, feelings, emotions, and relationships with family and peers. 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 and will have to hand it in at the end of the period. A number will be assigned to my questionnaire, and I will not be asked to write my name on any part of it. Once the questionnaire is completed, a researcher will measure my height and weight individually in a private space. Participating students will be thanked for completing the survey, in the form of either a prize draw or a pizza party. If for some reason the study researchers are unable to find me at my school, then I understand that I will be asked either by phone or my email to come to another location (i.e., the Royal Ottawa Mental Health Centre) in order to complete the study. I also understand that I will be weighed and measured at that same location, and that I will be paid for my time.

I have been assured that all answers will be kept confidential, that the completed questionnaires will be kept in a secure location that is only accessible to the researchers, and that the data that is collected will be kept for 10 years post publication. 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 or eating disorder), a member of the research team will get in touch, individually and confidentially, to make sure that I receive support and help if needed.

If I have any questions about my rights as a study participant, I can call Dr. Flament (Principal Investigator) at (613) 722-6521 ext. 6801.

I agree to participate in this study

I do not agree to participate in this study

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

Name: _____ Signature: _____ Date: _____

Name of Investigator: _____ Signature: _____ Date: _____



Research on Eating and Adolescent Lifestyle
REAL Study

**ASSENT FORM FOR STUDENT AT FOLLOW-UP TO BE RE-CONTACTED FOR THE
THIRD PHASE OF THE STUDY**

We thank you for participating again in the REAL study. Another follow-up may be done next year, and we wish to ask for your permission to re-contact you once more in one year's time.

Please be assured that you will in no way be obligated to participate in any further follow-up even if you agree to be contacted again, and your decision will not affect your participation in the current study.

I agree to possibly be contacted by the investigators in one year's time

My phone number is: _____

My email address is: _____

The school I plan on attending next year is: _____

I do not agree to possibly be contacted by the investigators in one year's time

There are two copies of this form. Please return one to your school and keep the other

Name: _____ Signature: _____ Date: _____

Name of investigator: _____ Signature: _____ Date: _____

Appendix B: Thank You Letter

Research on Eating and Adolescent Lifestyle
REAL Study
Participant “Thank-you” letter at follow-up



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 plays a role in the development of his/her body image, and healthy or unhealthy eating and weight.

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, 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 feel 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. 6801. Again, thank you for taking the time to be part of our study!

Appendix C: Demographics Questionnaire

Date: <input style="width: 100%; height: 20px;" type="text"/>	Teacher (name) <input style="width: 90%; height: 20px;" type="text"/>
day month year	

For each question, please pick up the answer that is true (or most true) for you. There are no right or wrong answers. We just want to learn more about youth like you. Your answers are confidential (your name will not appear anywhere on the questionnaire). If you have problems with any questions, please raise your hand and we'll come to help.

Please give ONE answer for each question by circling the corresponding number and/or filling in the blanks (grey zones)

1. What is your date of birth?

day month year
2. What grade are you in?

<input type="checkbox"/> 7 th	<input type="checkbox"/> 8 th	<input type="checkbox"/> 9 th
<input type="checkbox"/> 10 th	<input type="checkbox"/> 11 th	<input type="checkbox"/> 12 th
3. What is your gender?

<input type="checkbox"/> Male	<input type="checkbox"/> Female
-------------------------------	---------------------------------
4. How much school has your mother had?

<input type="checkbox"/> She didn't finish High School	<input type="checkbox"/> High School diploma	<input type="checkbox"/> College or University degree	<input type="checkbox"/> I don't know
--	--	---	---------------------------------------
5. How much school has your father had?

<input type="checkbox"/> He didn't finish High School	<input type="checkbox"/> High School diploma	<input type="checkbox"/> College or University degree	<input type="checkbox"/> I don't know
---	--	---	---------------------------------------
6. Which of the following groups best describes your ethnic origin?
 (you can mark two responses IF YOUR PARENTS each have a DIFFERENT origin)

<input type="checkbox"/> European	<input type="checkbox"/> Aboriginal	<input type="checkbox"/> Caribbean	<input type="checkbox"/> Central or South American
<input type="checkbox"/> Oceanian (Australia, New Zealand)	<input type="checkbox"/> North American (Canada, US)	<input type="checkbox"/> African	
<input type="checkbox"/> Asian	<input type="checkbox"/> Middle Eastern	<input type="checkbox"/> Other (which one?): _____	
7. What is the main language you speak at home with your parents? (mark ONLY ONE)

<input type="checkbox"/> English	<input type="checkbox"/> French	<input type="checkbox"/> Italian	<input type="checkbox"/> German	<input type="checkbox"/> Arabic
<input type="checkbox"/> Chinese	<input type="checkbox"/> Vietnamese	<input type="checkbox"/> Spanish	<input type="checkbox"/> Somali	<input type="checkbox"/> Other (which one?): _____

Appendix D: Dutch Eating Behavior 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
- 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

Appendix E: Family Adaptability and Cohesion Scale (FACES II)

Describe YOUR FAMILY

	Almost never	Once in a while	Some- times	Frequently	Almost always
1. Family members are supportive of each other during difficult times.....	1	2	3	4	5
2. In our family, it is easy for everyone to express his/her opinion.....	1	2	3	4	5
3. It is easier to discuss problems with people outside the family than with other family members.....	1	2	3	4	5
4. Each family member has input in major family decisions.....	1	2	3	4	5
5. Our family gathers together in the same room.....	1	2	3	4	5
6. Children have a say in their discipline.....	1	2	3	4	5
7. Our family does things together.....	1	2	3	4	5
8. Family members discuss problems and feel good about the solutions.....	1	2	3	4	5
9. In our family, everyone goes his/her way.....	1	2	3	4	5
10. We shift household responsibilities from person to person.....	1	2	3	4	5
11. Family members know each other's close friends.....	1	2	3	4	5
12. It is hard to know what the rules are in our family.....	1	2	3	4	5
13. Family members consult other family members on their decisions.....	1	2	3	4	5
14. Family members say what they want.....	1	2	3	4	5

- 15. We have difficulty thinking of things to do as a family.....1 2 3 4 5

- 16. In solving problems, the children's suggestions are followed.....1 2 3 4 5

- 17. Family members feel very close to each other.....1 2 3 4 5

- 18. Discipline is fair in our family.....1 2 3 4 5

- 19. Family members feel closer to people outside the family than to other family members.....1 2 3 4 5

- 20. Our family tries new ways of dealing with problems.....1 2 3 4 5

- 21. Family members go along with what the family decides to do.....1 2 3 4 5

- 22. In our family, everyone shares responsibilities.....1 2 3 4 5

- 23. Family members like to spend their free time with each other.....1 2 3 4 5

- 24. It is difficult to get a rule changed in our family.....1 2 3 4 5

- 25. Family members avoid each other at home.....1 2 3 4 5

- 26. When problems arise, we compromise.....1 2 3 4 5

- 27. We approve of each other's friends.....1 2 3 4 5

- 28. Family members are afraid to say what is on their minds.....1 2 3 4 5

- 29. Family members pair up rather than do things as a total family.....1 2 3 4 5

- 30. Family members share interests and hobbies with each other.....1 2 3 4 5

Appendix F: McKnight Risk-Factor Survey (MRFS IV) Perfectionism Subscale

The questions below ask about what it is like to be a teenager today. Please circle the number that BEST APPLIES TO YOU

Is this true ?	Not at all	A little	Pretty much	A lot	Totally
1. Only outstanding performance is good enough in my family.....	1	2	3	4	5
2. I try very hard to avoid disappointing my parents and teachers.....	1	2	3	4	5
3. I need to be the best at things.....	1	2	3	4	5
4. I feel that I must do things perfectly or not do them at all.....	1	2	3	4	5
5. I have extremely high goals.....	1	2	3	4	5

Appendix G: Silencing the Self Scale for Adolescents

	Strongly disagree	Neither Disagree or agree	Strongly agree		
1. I don't speak my feelings to my friends when I know they will cause disagreements.....	1	2	3	4	5
2. Caring means putting the other person's needs in front of my own.....	1	2	3	4	5
3. I find it is harder to be myself when I am with my friends than when I am on my own.....	1	2	3	4	5
4. I tend to judge myself by how I think my friends see me.....	1	2	3	4	5
5. I feel dissatisfied with myself because I am not able to do all the things students are supposed to be able to do these days.....	1	2	3	4	5
6. In my friendships, my responsibility is to make the other person happy.....	1	2	3	4	5
7. Caring means choosing to do what my friends want even when I want to do something different.....	1	2	3	4	5
8. One of the worst things I can do is be selfish.....	1	2	3	4	5
9. I feel I have to act in a certain way to please my friends.....	1	2	3	4	5
10. Instead of risking confrontations with my friends, I would rather not rock the boat.....	1	2	3	4	5
11. In order for my friends to like me, I cannot reveal certain things about myself to them.....	1	2	3	4	5

- 12. 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

- 13. When I am with my friends I lose my sense of who I am.....1 2 3 4 5

- 14. 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

- 15. My friends like and appreciate me for who I am.....1 2 3 4 5

- 16. Doing things just for myself is selfish.....1 2 3 4 5

- 17. When I make decisions, my friends' thoughts and opinions influence me more than my own thoughts and opinions.....1 2 3 4 5

- 18. I feel that my friends do not really know who I am.....1 2 3 4 5

- 19. I think it's better to keep my feelings to myself when they conflict with my friends'.....1 2 3 4 5

- 20. I often feel responsible for my friends' feelings.....1 2 3 4 5

- 21. I find it hard to know what I think and feel because I spend a lot of time thinking about how my friends are feeling.....1 2 3 4 5

- 22. 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

- 23. I try to bury my feelings when I think they will cause trouble with my friends.....1 2 3 4 5

- 24. I never seem to measure up to the standards I set for myself.....1 2 3 4 5