ON THE CONTINUUM OF EATING DISORDERS

by

Lana Lee Hawkins

B.A., University of Alberta, 1992

M.A., Simon Fraser University, 1998

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

in the

Department of Psychology

Faculty of Arts and Social Sciences

SIMON FRASER UNIVERSITY

2007

APPROVAL

Name:	Lana Lee Hawkins
Degree:	Doctor of Philosophy (Department of Psychology)
Title of Thesis:	On the Continuum of Eating Disorders
Chair:	Dr. Cathy McFarland Professor
	Dr. Robert Ley Senior Supervisor Associate Professor
	Dr. David Cox Supervisor Associate Professor
	Dr. Raymond Koopman Supervisor Associate Professor
Internal Examiner:	Dr. Rene Weideman Director Clinical Psychology Centre
External Examiner:	Dr. Ronald S. Manley Psychologist B.C. Children's Hospital
Date Approved :	May 15, 2007

SIMON FRASER UNIVERSITY
THINKING OF THE WORLD

STATEMENT OF ETHICS APPROVAL

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

(a) Human research ethics approval from the Simon Fraser University Office of Research Ethics,

or

(b) Advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University;

or has conducted the research

(c) as a co-investigator, in a research project approved in advance,

or

(d) as a member of a course approved in advance for minimal risk human research, by the Office of Research Ethics.

A copy of the approval letter has been filed at the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for approval and letter of approval are filed with the relevant offices. Inquiries may be directed to those authorities.

Bennett Library
Simon Fraser University
Burnaby, BC, Canada

ABSTRACT

Theorists and researchers have long debated as to whether the differences between subthreshold levels of eating disturbances and diagnosable eating disorders are a difference of degree (the continuum hypothesis) or a difference of kind (the discontinuity hypothesis). The present study investigated the relationship between level of eating disordered behaviour and the psychopathology associated with, and thought by some to be prodromal factors in, the development of clinically diagnosable eating disorders. Adolescent female students from both public and private schools, and adolescent female patients in treatment for subclinical or full syndrome anorexia or bulimia nervosa, were classified into five groups (asymptomatic, normal, symptomatic, subclinical, and eating disordered) on the basis of their responses to a questionnaire which provides a measure of current weight-control practices and yields a *DSM-IV* eating disorder diagnosis. Eating disorder symptomatology and related psychopathology were assessed by the Eating Disorder Inventory-2. A discriminant function analysis was performed to determine the number and nature of the dimensions required to distinguish among the five groups. Two functions were significant. The first function, thinness strivings, distinguishes among the normal, symptomatic, and subclinical groups; the asymptomatic group was equivalent to the normal group, and the eating disordered group was equivalent to the subclinical group. The second function, body dissatisfaction/psychopathology, distinguishes the eating disordered group from the subclinical group, and the asymptomatic group from the normal group. Results are discussed as being consistent with a view of eating disorders as being *distinct* from below-threshold levels of eating disturbances, and implications for assessment and treatment are discussed.

Keywords: Eating disorders, anorexia nervosa, bulimia nervosa, subclinical, continuum hypothesis, discontinuity.

DEDICATION

I wish to dedicate this thesis to my "team"—my dear husband, Greg, and my four darling children: Ava, Scotty, Mia, and Georgia.

ACKNOWLEDGEMENTS

I would like to extend my deep appreciation to Dr. Robert Ley, whose ongoing advice, support, and vision throughout the process of creating this thesis was key at each step of the way. As well, I owe a great debt of gratitude to Dr. Raymond Koopman, whose insights provided clarity both to the process and the results, and whose involvement was invaluable to the success of this project. I am also appreciative of the support and suggestions of Dr. David Cox, particularly his enthusiasm and encouragement to persevere. Each of these men contributed greatly to the development of this thesis, but more importantly, to my growth as a psychologist and an individual. Fot this, I am ever thankful.

In addition, I would like to thank Joan Foster for her valuable suggestions, and Joan Wolfe for her assistance with the formatting of the thesis document. Finally, I would like to formally thank all of those who participated in the project, particularly the Richmond, Burnette, Westview, and Crofton House schools' administration and staff; the British Columbia Children's Hospital's Eating Disorder Program; the University of Alberta's Eating Disorder Program; the Westwind Eating Disorder Recovery Centre; and the Calgary Counseling Centre. Without their support, and the participation of students and patients, this project would not have been possible.

I am, as well, extremely grateful to my family and friends, all of whom have sacrificed in order to allow me the time to work on this thesis. Thank you for this gift. I hope to repay you a thousand times over.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Professional as well as public awareness and knowledge about eating disorders, namely, anorexia and bulimia nervosa, have increased dramatically over the past several decades. In addition, much theoretical and empirical research has investigated other eating disorder variants, including binge-eating disorder, restrained eating, and attenuated forms of anorexia and bulimia. Despite this plethora of research, many important questions remain. One of the central or fundamental questions concerns the nature of the relationship between sub-clinical levels of eating disturbance and the eating disorders anorexia and bulimia nervosa. Over the years, a debate has developed between proponents of the so-called *continuum model* or *continuum hypothesis* of eating disorders, and those who support a model of discontinuity. The continuity perspective holds that eating disturbances fall on a continuum from least to most severe, and that movement across the continuum is possible for all persons. This model would support the assertion that *all* individuals (on such a continuum) can be conceived of as being vulnerable to the development of a clinically diagnosable eating disorder. Proponents of the alternate model, *the discontinuity model*, assert that there exist certain psychological characteristics of individuals, prodromal in nature, which render some individuals more vulnerable to the development of a full-blown clinical eating disorder syndrome than individuals not in possession of these characteristics. The purpose of the present investigation is to address some of the limitations of earlier studies in an attempt to shed further light on the matter of whether there is an identifiable *something different* about those individuals who develop eating disorders that exists above and beyond the driver(s) of eating disturbances as they exist in the remainder of the population. It is prudent, however, to first review the current definitions and epidemiological information on anorexia and bulimia nervosa, as well as historical and more recent conceptualizations concerning the etiology of these disorders.

Historical Conceptualizations of the Eating Disorders

Anorexia Nervosa

The first published medical account of anorexia nervosa occurred in 1689, when Richard Morton published "Phythisiologia, seu Exercitationes de Phthisi," which was translated into English five years later and subtitled "A Treatise of Consumptions." In it, he described a condition he observed in two of his patients which was characterized by extreme weight loss in the absence of physical disease. He termed this condition "a Nervous Consumption" and attributed it to "Sadness, and Anxious Cares" (cited in Silverman, 1997). However, the near simultaneous publication of Sir William Gull's 1874 "Anorexia Nervosa (Apepsia Hysterica, Anorexia Hysterica)" and Dr. Lasegue's 1873 "On Hysterical Anorexia" were far more influential. Lasegue's writings were primarily concerned with the etiology and description of the disorder, which he felt was entirely psychological in origin. The condition of self-inflicted starvation described in detail in each of these early-published reports is remarkably similar to contemporary descriptions of this disorder.

One of the core psychological features of anorexia, first noted by Lasegue in 1873, then later incorporated as one of three essential symptoms (along with cognitive and perceptual disturbances and pervasive feelings of ineffectiveness) in 1962 by Bruch is a distorted body image, such that the anorexic cognitively and perceptually overestimates the size of her body.[1] This body image distortion was characterized as notoriously resistant to change and was theorized to be paramount to the maintenance of the disorder, given that the anorexic *feels* fat, such that she never views herself as having reached her *thin* ideal, where a cessation of dieting might or would be justified.

By the early 1900s, reports concerning anorexia nervosa were commonplace. An excellent historical review is presented by Silverman (1997), which will be only briefly

[1] Although eating disorders occur in both males and females, given the preponderance of the disorders in females (approximately, 11:1), we will adopt the convention of referring to patients using the feminine pronoun.

summarized here. Initially, most writers continued the trend of assigning psychological origins to the disorder. For example, in 1911, Pierre Janet suggested that anorexia may result from fears of both becoming fat and of achieving sexual maturity. However, the publication in 1930 of a landmark paper by Simmonds in which he attributed the cause of anorexia in some patients as due to pituitary insufficiency had widespread influence. Treatments then shifted away from the psychological realm and were replaced in many cases by interventions aimed at correcting the presumed pituitary dysfunction. However, by 1936, articles began to appear in the medical literature cautioning against such an approach, again stressing the necessity of employing psychological interventions in the treatment of anorexia. Consistent with the dominant psychodynamic influence of the time, the initial trend was to interpret the condition in light of the oral component of the disturbance. Specifically, anorexia was conceived as an expression of repudiation of sexuality, specifically of "oral impregnation" fantasies. These oral impregnation fantasies were hypothesized to be associated with extreme guilt, resulting in a defensive weight loss through dietary restriction. However, largely due to the influence of Bruch (1962, 1973, 1978, 1982, 1985), the focus began to shift away from drive-motivated theories of etiology and towards an emphasis on both the personality of the individuals afflicted with anorexia and their interpersonal relationships, primarily the parent-child relationship.

Through her contact with numerous patients afflicted with anorexia nervosa, Bruch began to conceptualize the disorder as a form of hunger strike, which arose from the individual's struggle to develop an independent, self-respecting identity. In terms of the anorexic's outward appearance, Bruch noted:

> On first encounter anorexics...give the impression of great stamina, pride, and stubbornness. This impression is replaced, on closer contact, by the picture of underlying ineffectiveness, inability to make decisions, and constant fear of not being respected or rated high enough. These youngsters appear to have no conviction of their own inner substance and value, and are preoccupied with satisfying the image others have of them. The whole childhood of the eventual anorexic is infused by the need to outguess others and to do what they think the others expect her to do. (1978, p. 45)

Bruch observed that the child-rearing atmospheres in which the children were raised (particularly in middle class North American homes) seemed to be typified by unusually high parental expectations of the child's behaviour, an over-concern for what other people think of them, and an intolerance of disagreement or interpersonal conflict. As children, such girls are often highly praised for their compliance to parental and social expectations, which has the unfortunate effect of reinforcing their "fear of being spontaneous and natural, and interferes with [her] developing concepts, especially a vocabulary for her true feelings, or even the ability to identify feelings" (1978, p. 7). The result, hypothesized Bruch, was a girl who seemed quite perfect and well-adjusted by appearance, but who was lacking a sense of personal autonomy and inner-directedness. Bruch speculated that this false sense of personal competence generally serves the anorexic well until adolescence, a time at which "puberty and changes in social roles and expectations demand different behaviour and coping mechanisms, for which these young women are completely unprepared. It is at this time that the preoccupation with body and weight begins" (1978, p. 5).

Bruch (1973) asserted that *genuine* or *primary anorexia nervosa,* involved three areas of disordered psychological functions, which she felt were prodromal, not secondary, features of the disorder. The first symptom she identified was "a *disturbance of delusional proportions in the body image and body concept*...in which the often gruesome emaciation is defended as normal and right, and as the only possible security against the dreaded fate of being fat" (p. 252). The second outstanding feature of the illness was identified as a "*disturbance in the accuracy of the perception or cognitive interpretation* of stimuli arising in the body with failure to recognize signs of nutritional need as the most pronounced deficiency" (p. 252). She elaborated that while early descriptions of the disorder (and hence the name "anorexia" itself) suggested that patients truly lacked a sensation of hunger, her encounters with anorexic patients convinced her otherwise. Bruch instead asserted that the hunger disturbances observed in anorexia were related to an inaccuracy or non-recognition of the physical symptoms of hunger, rather than simply an absence of the sensation of hunger itself. She further hypothesized that anorexics who engage in binging and/or purging behaviour likely confuse painful or difficult emotional sensations with physical signs of hunger. In

addition, under the same category of inaccuracies of bodily awareness, such stimuli as perceptions of fatigue, sexual feelings, body temperature, and, perhaps most importantly, emotional states are also affected in this manner. The third important feature of anorexia nervosa identified by Bruch was "a *paralyzing sense of ineffectiveness,* which pervades all thinking and activities...they experience themselves as acting only *in response* to demands coming from other people in situations, and not as doing things because *they want to*" (p. 254). It is this last feature which Bruch accords paramount importance, as she proposed that the sense of ineffectiveness is the primary ego deficit from which other perceptual and conceptual disturbances originate, stating that "it is against this background of feeling helpless vis-à-vis life's problems that the frantic preoccupation with controlling the body and its demands must be understood" (1978, p. xi). Bruch in fact suggests that anorexia can be seen as an attempt at self-care, stressing that "long before the illness becomes manifest, these girls have felt helpless and ineffective in conducting their own lives and the severe discipline over their bodies represents a desperate effort to ward off panic about being completely powerless (1985, p. 10). Bruch asserted that disturbed patterns of family interactions were of primary importance in creating these deficits in autonomy and perceived self-directiveness.

Particularly in her later writing, Bruch underscored the importance of the clinician's understanding that the primary motivation of the anorexic is "an urgent need to be in control of their own lives and have a sense of identity" (1973, p. 269). This need becomes expressed as a "relentless pursuit of thinness" (1973, 1978) due both to the culture's emphasis on a thin female body form and to the symbolic associations inherent in food and eating. For Bruch, therapy is aimed at helping the anorexic "built up a new personality, after all the years of faked existence...all her efforts to be outstanding or perfect are directed toward hiding the fatal flaw of her inadequacy (1985, p. 15).

Other clinicians working with eating disordered patients theorized as to predisposing psychological factors, most notably Crisp (1974, 1980), Crisp and Fransella 1972), and Selvini-Palazzoli (1978). For Crisp, the important distinction between the normal dieter and the anorexic is that the motivations of the anorexic's weight restriction

are in essence an avoidance technique, in service of the goal of escaping the overwhelming demands of maturation and impending adulthood. Selvini-Palazzoli agreed as to the perceptual and self-esteem deficits proposed by Bruch, but added that there is a fundamental interpersonal distrust that is important in the personality structure of those predisposed to anorexia, which involves a general feeling of alienation, an avoidance of emotionally intimate relationships, and a tendency to not disclose one's thoughts and feelings to others.

The influence of these etiological theories of anorexia nervosa, and the role of family dynamics, received some support from the investigations of Minuchin, Rosman, and Baker (1978). In their investigation of families of anorexics, Minuchin et al. identified five predominant characteristics of family functioning (enmeshment, overprotectiveness, rigidity, lack of conflict resolution, and involvement of the sick child in unresolved parental conflict) which "describe a context in which the primary psychological features of anorexia nervosa described by Bruch fit and are adaptive" (Vandereycken, 1995, p. 260). The potential impacts of these characteristics are well-stated by Vandereycken:

> If the family is overinvolved with the anorexic, she need not perceive her own sensations. Others may recognize them first or deny their presence. The child must also be vigilant to perceive and respond to the signs of distress from others. In a context where everyone is vulnerable and protection is necessary, interpersonal trust does not develop. Where conflict and distress are denied or are not resolved, the child does not develop a sense of competence, and problem-solving skills are underutilized. The demands of the family interaction reinforce developmental lags, which make adaptation to the extrafamilial world more difficult. This magnifies the importance of the family, which further acts to maintain symptoms. (p. 260)

These early formulations of anorexia nervosa, which indicated family factors including expectations of conformity, high achievement, and a marked need for acceptance and approval, factors which ultimately result in intrapsychic deficits, led to conceptualizations of the disorder as a phenomenon of middle class female adolescents.

As testament to the importance of these etiological formulations, these ideas were accorded significance not only in the clinical practice of those working with eating

disordered patients, but also to those who endeavoured to develop valid and reliable objective tests or measures of eating disorder symptomatology. One of the most influential of the early tests, The Eating Disorder Inventory (EDI; Garner, Olmsted, & Polivy, 1983), included amongst its subscales indices directly related to the three variables to which Bruch accorded primary significance: Body Dissatisfaction, Interoceptive Awareness, and Ineffectiveness. Bruch's (1973, 1978) influence was also reflected in the EDI subscale of Perfectionism, a characteristic she noted as being particularly pervasive and problematic in the anorexic population. Crisp's formulation is represented by the Maturity Fears subscale, while the ideas of Selvini-Palazzoli are captured by the subscale of Interpersonal Distrust. Thus, as a result of the manifold influences of Bruch, Crisp, Selvini-Palazzoli, and others, Garner et al.'s original construction of the EDI featured the following scales: Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears. The Eating Disorder Inventory-2 (EDI-2; Garner, 1991), while it included three additional provisional subscales (Asceticism, Impulse Regulation, and Social Insecurity), retained each of the aforementioned original subscales, as does the current Eating Disorder Inventory-3 (Garner, 2004).

Bulimia Nervosa

In his detailed review of historical descriptions of bulimic-like behaviour, Russell (1997) asserts that while binge eating and/or compensatory mechanisms such as vomiting or fasting have been described in medical literature since William Gull's 1874 article on anorexia, the clinical entity of bulimia nervosa likely only emerged as a true separate diagnostic entity just prior to the 1970s. This assertion is based on the condition intrinsic to current *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR;* American Psychological Association, 2000) descriptions of the disorder relating to a pervasive fear of fatness, which appears to be characteristic of only those cases described from the 1970s onward. Therefore, while the behaviour of "bulimia" (literally translated as "ox hunger"), namely, episodes of binge eating, has a long

recorded history, diagnosable accounts of the disorder "bulimia nervosa" are relatively recent.

The binge-purge syndrome of bulimia nervosa as a distinct entity from anorexia nervosa was not reported in the literature until 1976, when Boskind-Lodahl reported her findings based on self-reported eating behaviour obtained from 138 participants recruited by advertisements in a university newspaper. She coined the term *bulimarexia* to describe the condition whereby compensatory methods such as "fasting, habitual forced vomiting, amphetamine and laxative abuse" (1976, p. 351) followed eating binges in the absence of anorexia nervosa. The syndrome was differentially and variably labelled by other authors as *bulimarexia, dysorexia,* or *dietary chaos syndrome* (Williamson, Barker, & Norris, 1993). In 1979, Russell reported on his findings of patients referred to the psychiatric department of a general hospital who vomited to mitigate the effects of a binge. As Russell observed that in the majority of cases, the individuals had a previous episode of anorexia nervosa, suggesting that the two disorders are linked, he coined the term *bulimia nervosa* to describe the bulimic syndrome. Bulimia nervosa was officially recognized by the American Psychiatric Association in 1980 (*DSM-III*), but the criteria at that time did not include a requirement that the individual exhibit a pronounced dread of fatness. This requirement was later incorporated into both the *DSM-III-R*'s (1987) and the International Classification of Diseases (ICD-10; World Health Organization, 1992) diagnostic categories for bulimia nervosa, and remains one of the necessary diagnostic criteria.

As was the case with anorexia nervosa, early formulations with respect to the etiology of bulimic behaviour were psychoanalytic in nature, and emphasized regression from phallic stages and oedipal complexes as well as oral and anal conflicts. Object-relations models were also proposed. In these models, with food being viewed as a symbolic equivalent of the oral mother (Sperling, 1949, cited in Bruch, 1978), the syndrome of binging and vomiting was viewed as a concrete expression of the introjection-projection struggles of early infancy. Subsequently, Bruch (1973, 1978) emphasized interpersonal, familial, and ego disturbances as fundamental in the etiology of the binging-purging behaviour she noted in her anorexic patients. As such, the

triumvirate of disturbed psychological functions that Bruch proposed were paramount in the etiology and the maintenance of anorexia nervosa were thought to also be disturbed in persons with bulimia nervosa. However, in her later writings, Bruch made clear her belief that bulimia was a distinct entity from anorexia nervosa, stating "the patients with bulimia whom I have studied bear little resemblance to those with genuine anorexia nervosa, though they too are inaccurate in hunger awareness and show poor control over food intake" (1985, p. 12). She elaborates that in her view, the driving motivations behind bulimia are very different from those with *primary anorexia*, and suggests that bulimia appears to be a "deficit in the sense of responsibility," highlighting the impulsivity that is characteristic of the disorder.

The vast majority of modern theorists, researchers, and clinicians would agree that both anorexia nervosa and bulimia nervosa are multi-determined disorders. That is, there is a general consensus that these disorders arise due to some combination of genetic, socio-cultural, familial, interpersonal, behavioural, and psychological factors. Despite this complexity, there remains a continued proliferation of research seeking to identify specific predisposing factors for these disorders in the hopes of informing more effective prevention and intervention strategies.

Current Diagnostic Systems and Epidemiology

The American Psychiatric Association's *DSM-IV-TR* defines the essential features of anorexia nervosa as follows: "the individual refuses to maintain a minimally normal body weight, is intensely afraid of gaining weight, and exhibits a significant disturbance in the perception of the shape or size of his or her body...in addition, postmenarcheal females with this disorder are amenorrheic" (p. 583). The suggested threshold for the weight requirement is a body weight less than 85% of the expected normal body weight based on age and height, and the criterion for amenorrhea is at least three consecutive absent cycles. The weight loss occurs as the result of a marked, wilful reduction in food intake, often accompanied by feelings of hyperactivity and intense, frequent bouts of exercise. The intense fear of weight gain characteristic of the

disorder is not ameliorated by weight loss, and in fact may increase while weight decreases.

The *DSM-IV-TR* makes the distinction between two subtypes of anorexia nervosa: the restricting type and the binge-eating/purging type. The restricting anorexic accomplishes weight loss solely through the restriction in food intake (perhaps combined with excessive exercise), and does not regularly engage in binge-eating or purging. The binge-eating/purging anorexic meets the *DSM-IV-TR* criteria for anorexia nervosa, but also regularly engages in binge eating (the consumption of an abnormally large amount of food in a given time period), purging (through the use of self-induced vomiting, diuretics, laxatives, or enemas), or both during the anorexic episode. It appears that most of the individuals of this latter subtype engage in binging and/or purging behaviour at least weekly, but no minimum frequency has been specified for inclusion in this diagnostic subtype.

The essential characteristics of bulimia nervosa as defined by the *DSM-IV-TR* are: (a) recurrent episodes of binge eating; (b) a feeling of lack of control over eating behaviour during the eating binges; (c) recurrent compensatory behaviour in the form of self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain; and (d) undue influence of weight and/or shape on self-esteem. In order to qualify for the diagnosis, the person must have had, on average, a minimum of two binge eating episodes and inappropriate compensatory behaviour per week for at least three months.

Unlike anorexics, individuals with bulimia tend to be within the normal weight range, although underweight and overweight categories have also been identified. The *DSM-IV-TR* makes a distinction between purging and nonpurging bulimic subtypes. The term *nonpurging* is somewhat misleading, however, for although the nonpurging bulimic does not regularly engage in the purgative method of vomiting, or the use of laxatives, diuretics, or enemas, they must have regularly engaged in either fasting or excessive exercise for the same purgative purpose.

In terms of differential diagnosis, it is important when assessing an underweight individual to distinguish between bulimia nervosa, purging subtype and anorexia nervosa, binge-eating/purging subtype. To ensure a proper diagnosis, the clinician must ascertain whether the individual also meets the *DSM-IV-TR* criteria for anorexia nervosa, which takes precedence over the bulimia diagnosis.

Estimates on the incidence or prevalence of eating disorders varies widely depending upon the sampling and assessment terms utilized, but tend to fall within the range of 3% to 10%, with bulimia nervosa outnumbering anorexia nervosa by approximately 2 to 1. The variability of estimates can be attributed to four main sources (Garfinkel et al., 1995): (a) differences in methods of sampling (e.g., college students, media surveys, etc.), (b) wide variations in response rates, (c) differences in method of case detection (e.g., questionnaire versus interview), and (d) differences in defining the syndrome [e.g., utilizing *DSM-III* versus the more stringent *DSM-III-R*, *DSM-IV*, or *DSM-IV-TR*)] criteria.

In their review of prevalence studies of eating disorders employing the current standard of a two-stage selection of cases, van Hoeken, Seidell, and Hoek (2005), reported prevalence rates of strictly defined anorexia nervosa ranging between 0.2 and 0.8% of young females, with the disclaimer that these rates are likely minimum estimates. Hudson, Hiripi, Pope, and Kessler (2007) recently reported prevalence rates, utilizing the World Health Organization Composite International Diagnostic Interview, based on a large scale study (n=9282) of a nationally representative (United States) sample. Prevalence rates for anorexia nervosa of 0.9% for females and 0.3% for males were obtained. Lucas and colleagues (1991, 1999), utilizing an extensive case-finding over the period of years from 1935-1989, reported an overall incidence rate of anorexia nervosa of 8.3 per 100,000 population per year. In incidence studies where sex differences are reported, the female to male ratio falls around 11 to 1 (e.g., Hoek et al., 1995). In terms of trends, anorexia nervosa demonstrates an increased incidence (in terms of registered cases) since the 1950s, which is most pronounced in females aged 15-24 (see van Hoeken et al., 2005, for review).

A large-scale epidemiological study was undertaken by Garfinkel and his colleagues (1995) aimed at assessing the incidence and prevalence of bulimia nervosa. Participants were Ontario residents (*N*=8,116) who were assessed face-to-face with the World Health Organization Composite International Diagnostic Interview, with specific questions added for bulimia nervosa. In this sample, the lifetime prevalence of full syndrome bulimia nervosa was assessed to be 1.1% for females and 0.1% for males. Similarly, in an effort to obtain an accurate estimate of eating disorder incidence and prevalence in the population at large, Woodside et al. (2001) conducted a large-scale community epidemiologic survey (the Mental Health Supplement to the Ontario Health Survey), randomly sampling households across the province of Ontario using a multistage cluster design. For each randomly chosen household, one individual aged 15 or older was randomly chosen for interview, resulting in a sample size of 9,953. Participants were interviewed face-to-face, with interviewers using the World Health Organization's Composite International Diagnostic Interview, which generates both *DSM-III-R* and ICD-10 diagnoses. Full-syndrome and partial-syndrome prevalence rates were obtained for both men (*N*=62) and women (*N*=212). For women, the prevalence rate of full-syndrome anorexia nervosa was 0.66%, with partial-syndrome anorexia nervosa at 1.15%. Full-syndrome bulimia nervosa in females had a prevalence rate of 1.46% whereas partial-syndrome bulimia nervosa was recorded at 1.70%. The female-male ratio of full-syndrome anorexia nervosa was 4.2:1, partial-syndrome anorexia nervosa 1.5:1, full-syndrome bulimia nervosa 11.4:1, and partial-syndrome bulimia nervosa 1.8:1. Analysis of variance showed a significant lowering of age of onset of eating disorder in the group of participants born after 1959, with no significant gender difference or gender-birth cohort interaction.

In general, in terms of age of onset, anorexia nervosa appears to have a lower age of onset than bulimia nervosa. For example, Turnbull, Ward, Treasure, Jick, and Derby (1996) reported that the highest incidence of anorexia nervosa occurred in females between the ages of 10 and 19, whereas the highest incidence of bulimia nervosa in females was between the ages 20 and 39. These findings are consistent with other reports in the literature (e.g., Lewinsohn, Striegel-Moore, & Seeley, 2000). Similar to anorexia, bulimia demonstrates an increased incidence, with Turnbull et al. (1996)

reporting a three-fold increase in incidence rates in the period 1988-1993 for women aged 10-39 years.

While initial reports of eating disorders suggested that they were largely an illness of those from higher socioeconomic backgrounds, subsequent findings have been mixed. In their extensive review of research on the topic of socioeconomic status and eating disorders, Gard and Freeman (1996) conclude that there is no convincing evidence that there is a socioeconomic bias in anorexia nervosa, and that if there is a relationship between socioeconomic status and bulimia, that it is skewed toward the lower class. They speculate that this myth was informed both by the overrepresentation of those from higher social classes in treatment (e.g., hospitals and clinics), and exacerbated by reports of prevalence and/or incidence which were based upon case records rather than by population sampling. However, there does appear to be a preponderance of eating disorder occurrence among certain racial groups. For example, eating disorders have been reported to be higher among Caucasian American females than their Black or Asian counterparts (Crago, Shisslak, & Estes, 1996). There is an increasing body of research which suggests that eating disorders are associated with identification to Western values and standards. For example, Davis and Katzman (1999) assessed the relationship between acculturation and eating disorders among Chinese students at five state universities in California. Despite no difference in acculturation scores between males and females, it was found that for females, increased acculturation was associated with elevated scores on the Eating Disorder Inventory (EDI) (Garner et al., 1983) subscales of Bulimia, Drive for Thinness, Interoceptive Awareness, Maturity Fears, and total EDI scores. For males, greater acculturation was associated only with higher EDI scores on the Perfectionism subscale.

While initial reports of men with eating disorders hypothesized many differences from their female counterparts, there is a growing body of evidence that the disorders present similarly in both sexes. For example, in a comparison of men and women with and without *DSM-III-R* eating disorders in a community sample, Woodside et al. (2001) found few sex differences in the variables of interest (e.g., age of onset, psychiatric comorbidity, family history, early life experiences, and history of serious sexual abuse),

apart from a much higher rate of sexual abuse reported by the women. On quality of life variables, men with eating disorders were indistinguishable from women with eating disorders.

There have also been reports that eating disorders occur at an increased rate among certain social subgroups and professions. In 1980, Garner and Garfinkel reported that within their sample of 183 professional ballet students, a full 6.5% met the diagnostic criteria for anorexia nervosa, and subsequent studies have identified this population as prone to both anorexic and bulimic symptomatology (e.g., Ringham et al., 2006). Elevated levels of eating disorder symptoms have also been reported in female gymnasts (Petrie, 1993), figure skaters (Brooks-Gunn, Burrow, & Warren, 1988), athletes (Sanford-Martens et al., 2005; Smolak, Murnen, & Ruble, 2000; Sundgot-Borgen, 1994), and runners (Hully & Hill, 2001). Some authors have argued that these athletes only superficially resemble eating disorder patients (see Garner, Rosen, & Barry, 1998 for review) due to the fact that the athletes tend not to exhibit the same levels of psychopathology evident in clinical samples. Others, however, stress the importance of the impact that severe pathognomic dieting and weight control practices can have on the long-term health of the athlete (Garner, Rosen, & Barry, 1998), regardless of the absence of eating-disorder-related psychopathology. As such, it is cautioned that these eating disorder symptoms should not be thought of as "benign."

Eating disorders have long been reported to be associated with comorbidity of psychiatric disturbance, however there has been some debate as to whether the disturbances in question are prodromal features or consequences of eating disorders. In an attempt to address this issue, Lewinsohn, Striegel-Moore, and Seeley (2000) conducted a community-based study of randomly selected high school students (N=891) and assessed the lifetime occurrence of the following potentially co-morbid disorders: Mood disorders (major depression, dysthymia, bipolar disorder, and subthreshold bipolar disorder), anxiety disorders (phobia, separation anxiety, overanxiety, panic, and obsessive-compulsiveness), disruptive behaviour disorder (attention-deficit hyperactivity, conduct, and oppositional defiant), and substance use disorder (both alcohol and drug). The authors reported a very high rate (89.5%) of at least one comorbid disorder in the

anorexia nervosa and bulimia nervosa groups of this non-clinical adolescent sample. They interpret this finding as suggestive that "comorbidity in ED is neither a phenomenon limited to adult and/or patient samples nor simply a consequence of chronicity of the eating disorder" (p. 1291). However, in their study of bulimia nervosa in a community sample (*N*=8,116), Garfinkel et al. (1995), while reporting considerable rates of lifetime comorbidity of bulimia with affective disorders, anxiety disorders, and alcoholism, stress that these rates are not as high as those found in clinical populations, and speculate that this discrepancy may reflect the higher probability of treatment-seeking when an individual has concurrent disorders.

In general, there appears to be a tendency for those with eating disorders involving bulimic (binge/purge) behaviour to exhibit a broader and more severe spectrum of psychiatric comorbidity (DaCosta & Halmi, 1992; Steiger & Seguin, 1999) than those who purely restrict. However, in summarizing their findings based on a retrospective comparison of anorexic patients seen at the Toronto Programme for Eating Disorders over the prior 15 years, Kruger, McVey, and Kennedy (1998) reported that anorexic patients of the bulimic subtype and pure restricting anorexics have become more similar over the years on several important variables. For example, the authors report a striking increase in the prevalence of purging behaviour which occurs in the absence of objective binges in the anorexia nervosa restricting subtype. Individuals who display this pattern also demonstrated a lowered prevalence of amenorrhea, as well as increased rates for affective and impulse-related comorbidity. In this way, non-binging, purging anorexics have begun to more closely resemble individuals of the anorexic binge eating/purging subtype. These findings are in keeping with earlier studies (e.g., Willmuth et al. 1988) in which bulimics who purge demonstrated greater psychopathology than non-purging bulimics. In discussing their results, Kruger et al. call into question the more recent *DSM*'s system of subtyping anorexics into restricting and bulimic subtypes as they now appear to show considerable symptom overlap. Further, the current *DSM-IV-TR*'s diagnostic classification for the restricting subtype may blur important differences between purging and non-purging restrictors. Lastly, the authors call into question the necessity of including amenorrhea as a prerequisite for the diagnosis of anorexia nervosa. This interpretation is in keeping with the results of Garfinkel et al.'s (1996)

finding that anorexics who fulfilled all of the *DSM-III-R* features of anorexia nervosa apart from amenorrhoea did not differ from anorexics with amenorrhoea on a number of relevant variables (e.g., age of onset, maximum and minimum weights, percentage of weight loss, and comorbidity for depression, anxiety disorders, or alcohol dependence). These authors, too, questioned the utility of the *DSM*-criterions of amenorrhea for the anorexia nervosa diagnosis.

In addition to simply assessing epidemiology in their 1995 Ontario study, Garfinkel et al. sought to assess the relationship between full syndrome and partial syndrome bulimics, specifically those individuals who met all but the *DSM-III-R* binge-eating frequency criterion, in a non-clinical population. The results of their comparisons between females with diagnosed *DSM-III-R* bulimia nervosa and the partial syndrome group indicated few meaningful differences between the groups. Both groups exhibited a threefold increase in the lifetime occurrence of major depression and a doubled rate for anxiety disorders. Both groups, as well, reported *serious* sexual abuse [i.e., endorsed item "tried to have sex with you or sexually attacked you" (p. 1054)] at nearly three times the rate of the female comparison group. There were few differences between the bulimia nervosa and the partial syndrome group either in terms of their compensatory behaviours or on their comorbid diagnoses, other than that the rates of alcoholism in the partial syndrome group fell midway between the full syndrome and the comparison group. In light of these results, Garner et al. stress "the arbitrary nature of such a criterion in distinguishing threshold and subthreshold groups...these findings support a spectrum concept of the disorder, with various levels of vulnerability...[and] suggest a need for further refinement of the diagnostic criteria for bulimia nervosa" (p. 1057-1058). In contrast to theories stressing the importance of depression either to the etiology or the maintenance of bulimia nervosa, the authors found that the greater rates of comorbidity observed in their study were "not specific or preferential for depression...women with bulimia nervosa were equally vulnerable to develop an anxiety disorder or alcohol abuse" (p. 1056-1057).

Despite the discrete classification of anorexia nervosa and bulimia nervosa in the *DSM* classification system, there is widespread acknowledgement that the two disorders

show considerable overlap, given the tremendous heterogeneity in patients due to variability in both symptoms and comorbidity Indeed, there are indications that some patients may move between categories. For example, in a 15-year follow-up study, Bulik, Sullivan, Fear, and Pickering (1997) found that 54% of females with anorexia nervosa, restricting subtype, developed bulimic symptoms, and Herzog, Hopkins, and Burns (1993) reported that 16% of patients diagnosed with anorexia nervosa, restricting subtype, went on to develop *DSM*-diagnosable bulimia nervosa.

The Relationship Between Eating Disorders and Sub-Clinical Eating Disorders

Individuals who evidence some of the features of eating disorders (such as intensive dieting, binging, and purging) but who do not meet the full diagnostic criteria (according to various classification schemes) required for a diagnosis of anorexia nervosa or bulimia, have been variously classified as having a *partial syndrome* (Fairburn & Beglin, 1990), a subthreshold, or a subclinical eating disorder (Button & Whitehouse, 1981). In addition, the *DSM-IV-TR* includes a category for *eating disorder not otherwise specified*, for capturing those individuals whose eating disturbances are significant but below the threshold level for a diagnosis of anorexia nervosa or bulimia nervosa. Button and Whitehouse, in 1981, were the first to note that "many young women experience the preoccupation with weight and the forms of behaviour associated with anorexia nervosa without being extremely emaciated" (1981, p. 514). They therefore suggested the usefulness of the term *subclinical anorexia* in the classification of such individuals with an attenuated form of eating pathology.

Over time, a debate has developed between those who view eating disorders as representing an extreme endpoint on a continuum of weight-related concerns and behaviours on which all individuals lie (first suggested by Nylander, 1971), and those who insist that there are some distinguishing features of those with eating disorders, features which exist outside of this continuum, which render some individuals vulnerable to the development of eating disorders while other individuals not in possession of these

features remain *normal dieters* [as suggested by Bruch (1973), Crisp (1965), and Selvini-Palazzoli, (1978)].

According to the continuum model of eating disorders, the difference between milder forms of eating disturbance and clinical eating disorder syndromes is simply a matter of degree and not kind. Nylander, upon finding that nearly 10% of his sample of young women reported at least three symptoms characteristic of anorexia nervosa, suggested that milder forms of eating disturbances resemble clinical eating disorder syndromes, and suggested that the difference between the two was simply a matter of severity. He further speculated that anorexia and bulimia nervosa develop as a result of the physiological malnutrition that occurs with prolonged, extreme dieting, and that malnutrition itself is responsible for the psychological and behavioural symptoms associated with eating disorders. As such, he was an initial proponent of the continuum hypothesis, which carries the implication that any individual who engages in extreme and prolonged dieting is *at risk* for the development of anorexia or bulimia nervosa. In general, research that has identified increases in pathology as one moves along the continuum of groups from least to most eating disordered, as well as research that has found that the same variables that distinguish between eating-disordered individuals and the subclinical group also distinguishes between the subclinical and the control group, has been interpreted as evidence in support of the continuum model.

In contrast, other theorists (e.g., Bruch, Crisp, Selvini-Palazzoli, and others) have conceptualized anorexia and/or bulimia nervosa as qualitatively distinct from non-clinical, milder eating disturbances. These theories have emphasized the importance of certain psychological variables (e.g., interpersonal distrust, struggles for autonomy and personal effectiveness) in the etiology of eating disorders. It is asserted that these psychological vulnerabilities become motivators for body dissatisfaction and thinness strivings, and it is this *drive* that differentiates at-risk individuals from those with milder forms of eating disturbance whose motivations are more benign. Consequently, while many individuals may engage in dieting and weight control practices, most are unlikely to progress to a full eating disorder syndrome. Proponents of the discontinuity model would argue that the similarity often noted between subclinical individuals and those diagnosed with a

formal eating disorder are often only superficial in nature, and that only a portion of these individuals possess the psychological profile which would render them vulnerable to the development of a full-syndrome eating disorder.

Few epidemiological studies have addressed the issue of these subclinical eating disorders, and as such, the course and outcome of these conditions is unclear. In an attempt to determine the persistence and progression of eating disorder symptoms over time, Drewnowski, Yee, Kurth, and Krahn (1994) conducted a longitudinal survey which assessed the eating patterns of 557 college women using a self-report measure which included items that "approximated the *DSM-III-R* criteria for bulimia nervosa" (1994, p. 1217), and which allowed for participants' classification into the following categories: nondieters, casual dieters, intensive dieters, dieters at risk, and bulimic. Changes in category status were assessed over a six month period. The authors found that 4% of intensive dieters and 15% of dieters at risk moved to the bulimic category, which suggests that subclinical eating disordered behaviour does indeed predispose some individuals to the development of a clinically diagnosable eating disorder. In all cases of bulimia, it was found that fasting, binge eating, and purging preceded the onset of diagnosable bulimia by six months, and *in no cases* did participants from the casual dieters or nondieters categories move to the bulimic category. In all categories, although a large percentage of participants retained the same classification as they had at baseline, when shifts occurred, they tended to occur between adjacent categories in both directions for all of the groups, which the authors interpret as providing support for the continuum hypothesis of eating disorders. By the end of the six-month study period, 30% of the nondieters had moved to the casual dieter category, 11% of the casual dieters had moved into the intensive dieter category, 9% of the intensive dieters had moved to the dieters at risk category, and 15% of the dieters at risk had progressed to the bulimia nervosa category. The authors note that the finding that only 15% of the dieters-at-risk became bulimic necessitates further research into the social and psychological factors that are important in the development or prevention of eating disorders.

The current study comprises an initial review of the accumulated research on the topic of the continuity/discontinuity hypotheses of eating disorders, and subsequently an analysis, which in addressing some of the limitations of previous studies, strives to further clarify this issue which has important practical implications for prevention, diagnosis, and treatment. As a prelude to the review of past research on the topic, it can be stated that in general the results have been interpreted by the researchers according to the following criteria (stated here as pertaining only to bulimia, but can be extended to those studies investigating the anorexic continuum as well):

> The continuity perspective would be supported by research findings that the same variables that differentiate controls from subclinical bulimics, differentiate subclinical bulimics from bulimics. The discontinuity hypothesis would be supported by research finding that the variables that separate controls from subclinical bulimics fail to distinguish between subclinical bulimics and bulimics or vice versa. Similarly, research finding that the variables that separate controls from subclinical bulimics are different than those that separate subclinical bulimics from bulimics would also support the discontinuity position. If a variable differentiates controls from both subclinical and clinical bulimics, yet fails to differentiate subclinical bulimics from bulimics, this would fail to support the continuity hypothesis. (Stice, Ziemba, Margolis, & Flick, 1996, p. 534)

In order to keep the review of relevant research manageable, the review will be organized as follows: Those studies which have been interpreted by the researchers (or subsequent authors) as providing support for the continuity hypothesis, those which do not provide support for the continuity hypothesis, and those which found mixed results. As the present study operationalizes the psychopathological features characteristic of anorexia and bulimia nervosa according to the psychological subscales of the EDI-2 of Garner (1991), the three aforementioned categories will be further subgrouped into those studies which utilized the EDI-2 or its predecessor, the EDI (Garner, Olmsted, & Polivy, 1983), in their analyses and those which did not.

Research Supportive of the Continuity Model

Studies Not Utilizing the Eating Disorder Inventory

Mintz and Betz (1988)

While previous research had attempted to understand psychological differences between clinical participants and various syndrome groups, Mintz and Betz (1988) were the first to operationalize an eating-disorders continuum based on *DSM-III-R* criteria and to begin to compare these groups accordingly. As the basis for their group classifications, the authors utilized a questionnaire, Ousley's (1986) Weight Management, Eating, and Exercise Habits Questionnaire (WMQ), which allowed them to ascertain participants' responses to *DSM-III* criteria, making slight changes in certain questions to allow for the updated *DSM-III-R* criteria. The participants were 643 undergraduate females enrolled in an introductory psychology course, and had a mean age of 18.6 years. Nonanorexic, nonobese participants were classified on the basis of their responses to the WMQ into the following categories: normals (n=211), bulimics (n=20), bingers (n=100), purgers (n=66), chronic dieters (n=73), and subthreshold bulimics (n=173). Dependent measures included self-report measures of body satisfaction (Body Parts Satisfaction Scale; Bohrnstedt, 1977), self-esteem (Self-Esteem Scale; Rosenberg, 1965), endorsement of sociocultural mores, and a supplemental measure assessing body image. In discussing their findings the authors noted that dieting was very common in their sample, and the majority of those sampled reported being at least somewhat fearful of becoming fat. A full 82% of participants reported one or more dieting behaviours at least daily, 38% reported problems with binging, and 33% acknowledged at least monthly use of laxatives or vomiting for weight control. All told, only 33% of the sample could be classified as "normal eaters," according to *DSM-III-R* operationalized criteria. In response to these figures, the authors state that "given these findings, it seems reasonable to conceive of bulimia nervosa as normative behaviour taken to an extreme" (p. 469).

ANOVAs assessing group differences on the measures of interests identified the bulimic group to score significantly poorer than the subthreshold group on all indexes, apart from four of the seven sources of self-esteem (career or school, friendships, personal qualities, and romantic relationships), In consideration of the sum of their findings, Mintz and Betz assert:

> although bulimics were clearly the least and normals the most healthy in terms of overall self-esteem, body image, and beliefs about attractiveness, consistently intermediate values among the theoretically intermediate groups provide further support for the idea of an eating disorder continuum. (p. 470)

A closer look at the results of this study, however, reveals some results inconsistent with the continuity model. Self-esteem, as the only index of potential psychological disturbance in this study, is the variable of true interest in terms of the continuity/discontinuity debate. A plot of the mean self-esteem and mean body satisfaction scores by group indicates that for all but the bulimic group, self-esteem scores are higher than body satisfaction scores. For the bulimic group, however, this pattern suddenly reverses: self-esteem scores plummet and are far below mean body satisfaction scores. In addition, a plot of group means on a measure of endorsement of sociocultural mores regarding female thinness appears visually as a linear trend as one moves from chronic dieter to binger to purger to subthreshold. However the line rises sharply at the bulimic group, as though one turned a corner. As such, while the authors cite support for continuity, some of their findings are inconsistent with this interpretation.

Prather and Williamson (1988)

The authors of this study sought to clarify the differences between different subtypes of obesity (those who binge, those who present for treatment for obesity, and those who do not seek treatment for obesity), as previous studies had found inconsistent results when assessing psychopathology in the obese, but none had at that time separated the obese participants into homogenous groups based on the aforementioned distinctions. As such, they undertook to compare the psychopathology associated with homogeneous groupings of bulimic binge-purgers (N=16), bulimic binge-eaters (N=16),

nonbulimic obese presenting for treatment for obesity (*N*=16), obese not in treatment (*N*=16), and normal control participants (*N*=16). The former three groups consisted of treatment-seeking females obtained from an eating disorders clinic, whereas the latter two groups were females recruited either from undergraduate psychology classes or from the surrounding community. All participants undertook a structured interview and completed the Eating Questionnaire (EQ, developed by the authors to assess *DSM-III* symptoms of bulimia nervosa). In order to be classified as a binge-purger, participants had to meet the *DSM-III* criteria for bulimia and also report purging behaviour on both the EQ and upon interview. Participants meeting the *DSM-III* criteria for bulimia but not reporting purging were classified as binge eaters. The authors note that there was no weight criterion for either the binge-purger or the binge eater classification. Participants were classified as obese if they did not meet the *DSM-III* diagnostic criteria for bulimia, and reported no problems with eating, weight, or purging, provided they were at least 20% above normal weight for their height. The normal control group "were screened for eating disorder symptoms" (p. 178), and had to be within the normal weight range.

Each participant was asked to complete the Eating Attitudes Test (Garner & Garfinkel, 1979), the Bulimia Test (Smith & Thelen, 1984), the Minnesota Multiphasic Personality Inventory (MMPI), the Symptom Checklist-90 Revised (Derogatis, Rickels, & Rock, 1976), and the Beck Depression Inventory (Beck, 1978). Chi-square analyses were performed to test for group differences on subscale elevations on the measures of interest. Using the definition of at least one clinically elevated MMPI scale as their criterion for global psychopathology, the authors reported "clinically important differences in psychopathology" (p. 182) between the three eating disorder groups (bulimic binge-purgers, bulimic binge-eaters, and nonbulimic obese) and the two control groups (obese not in treatment and normal controls). Moderate to severe levels of psychopathology were found in the binge-purger group, and in both the binge-eater group and the obese presenting for treatment exhibited psychopathology (particularly mild to severe depression) compared to the obese and the normal control groups. While the issue of the continuity versus discontinuity debate was not explicitly addressed in the article, the finding of "a continuum of severity of psychopathology across eating disorder groups,"

(p. 182) was subsequently referred to by other authors as supportive of the continuity model of bulimia.

Stice, Ziemba, Margolis, and Flick (1996)

Stice et al. (1996) proposed the *dual pathway* model of bulimia, which asserts that dietary restraint and negative affect are the "final proximal predictors of bulimic pathology and that the effects of the other risk factors are mediated by these two mechanisms" (p. 352). In this model, dietary restraint can occur from body dissatisfaction resulting from perceived sociocultural pressure to be thin, which may also result in an ideal-body internalization. Negative affect is conceived of as an important contributor to bulimic symptomatology, in that both binging and purging become mechanisms to regulate mood. In a study conducted to test the validity of their dual pathway model, the authors also addressed the continuity/discontinuity debate with respect to bulimia, by testing to see if the variables that distinguish controls from bulimics are the same as those that distinguish controls from subclinical bulimics.

A large sample of female high school (n=320) and college students (n=117) were categorized as to eating disorder status on the basis of their responses to selected items taken from the bulimia test (BULIT-R) (Thelen, Farmer, Wonderlich, & Smith, 1991). In order to be classified as putative bulimic (n=18), participants had to report uncontrollable binge eating at least twice a week for the past three months or more, at least *frequent* use of purging (e.g., self-induced vomiting, vigorous exercise), and at least a *frequent* obsession regarding body shape and weight. Subclinical bulimics (n=46) had to report all three of the following symptoms at subthreshold levels: uncontrollable binge eating, use of purging, and *moderate overconcern* with body shape and weight. Control participants (n=61) were those who denied any binge eating, purging, or overconcern with weight and shape. It is notable that participants who reported either binging, purging, or obsession regarding body shape, but not all three symptoms together, were excluded from the analysis. The author's state this approach was chosen as it yielded a more homogenous group of participants, and "avoided the problem of mixing together women with vastly different symptom profiles" (p. 537).

Participants were tested with respect to body mass, perceived sociocultural pressure (to have a thin body), ideal-body internalization, body dissatisfaction, dietary restraint, and negative affect. One-way ANOVAs were carried out on each of the variables composing the dual pathway model, with the independent variable being group membership. Significant group differences were found for all variables apart from body mass. Planned contrasts between groups on each of the variables were identified as supportive of the continuity hypothesis, in that several variables (overall perceived pressure, partner pressure, media pressure, ideal-body internalization, dietary restraint, overall negative affect, sadness, and guilt) differentiated controls from subclinical bulimics, and subclinical bulimics from bulimics. However, bulimics did not differ significantly from subclinical bulimics, but each scored more highly than controls on the variables of family pressure, friend pressure, body dissatisfaction, hostility, and anxiety. Further stated support for the continuum hypothesis was generated by the results of a discriminant function analysis, which utilized the six overall scales as predictive of group membership. One discriminant function of significance was identified, which accounted for 97.97% (eigenvalue=1.97) of between-group variability, and successfully differentiated controls, subclinical bulimics, and bulimics. Apart from body mass, all variables contributed substantially to this function. This finding, that the three groups differed along only one function, would suggest that the groups differ from each other quantatively rather than qualitatively.

With respect to the limitations of the study, the authors point out that in addition to the potential validity problems with data based on self-report, the study was cross-sectional in design, and thus causal inferences about the direction of effects cannot be made. Finally, given the relatively small number of putative bulimics, it was suggested that future research replicate the study with a larger eating disordered sample.

Stice, Killen, Hayward, and Barr Taylor (1998)

In a related study, Stice, Killen, et al. (1998) obtained a large sample of female high school students, and classified them into groups on the basis of their responses to a structured clinical interview (EDE; Cooper, Cooper, & Fairburn, 1989) based on *DSM-III-R* criteria, which was adapted for use with adolescents. The bulimic group (n=19) had

to report uncontrollable binge eating of a *large amount of food* over a short time at least two times a week for the past three months and the use of purging (self-induced vomiting, laxatives, diuretics, or excessive exercise) as compensation. It is unclear from the authors' description whether or not a certain frequency of compensatory behaviour was required in order to meet their bulimic classification. It is also notable that in contrast to their earlier (1996) study, their bulimic category did not require obsession with shape and weight to fulfil the classification requirements. Subthreshold bulimics in this study (n=141) only needed to report having at lease one episode of uncontrollable binge eating and at least one incidence of purging in the past three months. Again, in contrast to their earlier study, participants did not need to evidence over-concern with body shape and weight in order to meet the subclinical bulimic classification. Individuals (n=660) who denied the occurrence of either binge eating or purging in the past three months were classified as noneating-disordered controls. Persons who reported only binging (n=63) or purging (n=37) were excluded from the analysis, as "they could not be placed in any of the three groups" (p. 788).

A discriminant function analysis was undertaken with seven independent variables (BMI, thin-ideal internalization, body dissatisfaction, dietary restraint, depressive symptoms, anxiety symptoms, and emotionality) used as predictors of group membership. The authors reported that only one discriminant function was required to differentiate control, subthreshold bulimic, and bulimic participants. This function accounted for 97% of the between-groups variance, and appeared to primarily reflect weight-concern (with correlations for thin-ideal internalization, dietary restraint, and body dissatisfaction loading at .86, .81, and .63 respectively), but also reflected some psychopathology (anxiety symptoms, depressive symptoms, and emotionality correlated at .59, .46, and .49 respectively). BMI contributed only marginally to this factor (r=.26). The group means (centroids) on this function exhibited a linear relationship, with all three groups differing significantly from each other in the expected direction (control<subthreshold bulimic<bulimic), providing further support for the continuity perspective. Pairwise contrasts indicated that body dissatisfaction, dietary restraint, emotionality, and anxiety symptoms differentiated the three groups, but the variables of thin-ideal internalization and depressive symptoms were only able to differentiate

controls from subthreshold bulimics, while subthreshold bulimics and bulimics did not differ on these variables. The authors deal with these contradictory results by stating that "because discriminant function analysis provides a more appropriate test of the continuity hypothesis than pairwise contrasts and incorporates the intercorrelations among independent variables, we feel the findings from the multivariate approach should be given precedence" (p. 788). In light of this stance, the authors interpret their results as being supportive of the continuity model of bulimia.

Studies Utilizing the Eating Disorder Inventory

Thompson, Berg, and Shatford (1987)

In a study designed to assess the use of food as a coping mechanism, as well as the use of cognitive distortions regarding food and weight loss in relation to bulimic symptomatology, Thompson et al. also explored the concept of the continuum hypothesis with respect to bulimic symptoms. Participants were 95 female undergraduate students, who were asked to complete a questionnaire which operationalized the *DSM-III* diagnostic criteria for bulimia, the Eating Disorder Inventory, and surveys designed to assess the tendency to utilize food as a coping mechanism as well as the extent and nature of cognitive distortions around food- and weight-related issues. Individuals were classified into groups according to their responses to the measure of operationalized *DSM-III* status. The bulimic group (n=19) consisted of those who met all of the *DSM-III* criteria for bulimia nervosa. Symptom-free (N=35) individuals denied the rapid consumption of 1200 or more calories more than one or two times in the last month, denied being unable to voluntarily stop eating more than once in the last month, and denied ever attempting to lose weight through the use of vomiting, laxatives, or diuretics. Symptom-free participants' responses to questions related to binging and other forms of purging other than those outlined above were required to produce an average response of between *rarely* and *never* for their inclusion in this group. Finally, bulimic-like (N=41) individuals were defined as those who did not meet all of either the bulimic or symptom-free criteria. A one-way univariate analysis was performed to compare the bulimic, bulimic-like, and symptom-free group on all dependent measures,

including the eight subscales of the EDI. Consistent with the expectations of the continuum hypothesis, the symptom-free group differed significantly from the bulimic-like group who in turn differed from the bulimic group on the EDI subscales of Drive for Thinness and Interoceptive Awareness. However, pairwise contrasts using the Scheffe procedure indicated that on the EDI subscales of Perfectionism and Body Dissatisfaction, the bulimic-like and the bulimic group did not differ, but each differed significantly from the symptom-free group. Only the bulimics and symptom-free groups differed significantly on the Ineffectiveness subscale, and no significant differences were found on the subscales of Interpersonal Distrust or Maturity Fears between any of the three diagnostic groups. The authors speculate that this latter finding may reflect a higher degree of relevance of these constructs to anorexia nervosa than to bulimia. In summarizing their findings, the authors emphasize that for the majority of their measures (13 out of 19) for which group differences were found, the increases in scores were from symptom-free to bulimic-like to bulimic groups. However, for six of the remaining seven measures, the bulimic-like and bulimic groups were indistinguishable, which is not consistent with the expectation of the continuity hypothesis. Nonetheless, Thompson, Berg, and Shatford assert that their results indicate that "the behavioural, affective, and attitudinal indices of bulimia fall along parallel continua of symptomatic severity" (p. 229).

Vanderheyden and Boland (1987)

Vanderheyden and Boland (1987) sought to compare how personality and eating disorder characteristics vary depending upon one's placement along a continuum of bulimic pathology. Their primary interest was to investigate the hypothesis that as the severity of binging increases, the characteristics of the non-vomiting binge-eater will greater approximate the characteristics of the binge-vomiter.

Female undergraduate university students were classified according to self-report indices and scores on the binge scale (Hawkins & Clement, 1984), and were grouped as follows: normals (n=73), mild binge eaters (n=23), moderate binge eaters (n=23), severe binge eaters (n=14), and binge vomiters (n=18). Eating disorder characteristics were assessed with the Restraint Scale (Herman & Polivy, 1975), the Eating Disorder Inventory (Garner et al., 1983), and the Eating Attitudes Test (Garner,

Olmsted, Bohr, & Garfinkel, 1982). Self-image was assessed with the Negative Self-Image Scale (Hawkins & Clement, 1984), and general psychopathology with the Hopkins Symptom Checklist (Derogatis et al., 1974).

The results of a discriminant function analysis isolated one significant function ($p<.0001$) which accounted for 94.45% of the variance in group scores, as well as a further two that did not reach significance. The three functions together were able to correctly classify 48.3% of the participants, with most errors occurring between normals and mild binge eaters, and between severe binge eaters and binge vomiters. The three variables which had the highest correlation with the first function were Drive for Thinness, negative self-image, and restraint. This finding was discussed by the authors as an indication that restraint is associated with (and likely produces) binge eating, but the study has been cited by other authors as evidence supportive of the continuity model as only one discriminant function was necessary to separate the groups. However, Vanderheyden and Boland noted that when an analysis of variance was performed on the three variables identified as important in the discriminant function (Drive for Thinness, restraint, and negative self-image), severe binge eaters and binge vomiters were indistinguishable, and that finding is clearly not consistent with the continuity model.

Rossiter, Wilson, and Goldstein (1989)

In an effort to better identify the specific psychopathological features of bulimia nervosa, Rossiter, Wilson, and Goldstein compared patients diagnosed with bulimia with both restrained and unrestrained control groups.

A sample of 10 participants meeting diagnostic criteria for bulimia (Fairburn, 1985; Russell, 1979) was recruited via local newspaper advertisements. Nonbulimic individuals were recruited from undergraduate classes as well as the university community, and were selected on the basis of cut-off scores on Lowe's (1984) Dietfac, (which was derived by factor analysing Stunkard and Messick's (1985) Three Factor Eating Questionnaire). These individuals were classified as restrained eaters if they scored above the median score on Lowe's Dietfac (7.33), while those who scored below

this median were classified as unrestrained controls. All participants completed a number of measures including the Beck Depression Inventory (Beck et al., 1961), the Eating Habits Checklist (EHC; Gormally et al., 1982), the Symptom Checklist 90-revised version (Derogatis, 1977), and the Eating Disorder Inventory (EDI).

A two-way multivariate analysis of variance indicated overall group differences among the three groups on all measures. Subsequent univariate *F* tests revealed that bulimic and restrained participants were indistinguishable, but each significantly differed from the normal controls on measures of fear of weight gain, the Restraint Scale (Herman & Polivy, 1980), the Three Factor Eating Questionnaire (TFEW), and on the EDI subscales of Body Dissatisfaction and Drive for Thinness. The mean score of the bulimic group was significantly higher than that of the restrained group, who themselves scored higher than controls on the Eating Habits Checklist (EHC), the Disinhibition subscale of the Three Factor Eating Questionnaire (cited in Rossiter, Wilson, & Goldstein, 1989), and the Eating Disorder Inventory total score. The bulimic group scored significantly higher than both the restrained and unrestrained groups (who did not differ from each other) on the Beck Depression Inventory, the EDI subscales of Interoceptive Awareness, Ineffectiveness (although this scale is referred to as *introversion* by the authors in error), and bulimia, as well as on the SCL-90R Global Severity Index.

The authors interpret their finding of significant increases in scores on the EDCL, TFEQ Disinhibition scale, and the EDI total score as one moves from unrestrained to restrained to bulimic status as providing support for "a continuum of disordered eating with increasing restraint leading to increasing hunger and difficulty with controlling impulses to eat in disinhibiting situations" (p. 466). However, the scales on which the bulimic participants were significantly more disturbed than the equally-scoring restrained and unrestrained groups were on measures of depression, self-esteem, and general psychological distress, and these findings are not consistent with the continuity model.

Dancyger and Garfinkel (1995)

In a study comparing female full scale (FS) hospitalized eating disorder patients to female high school students classified as having a partial syndrome (PS) eating disorder or as a normal control (NC), Dancyger and Garfinkel compared the participants' scores on three of the eight EDI subscales (Body Dissatisfaction, Ineffectiveness, and Interoceptive Awareness). The high school sample of PS and the NC participants were initially classified into groups on the basis of their scores on the Eating Attitudes Test (EAT, Garner & Garfinkel, 1979), which measures a range of behaviours and attitudes characteristic of anorexia nervosa. High scorers on the EAT (scores>20) were selected for interview [based on the Eating Disorder Examination (EDE) of Cooper and Fairburn (1987)]. Partial syndrome anorexics (n=33) were required to meet all the *DSM-III-R* (American Psychiatric Association, 1987) criteria for anorexia nervosa, with the exception of the degree of weight loss and the requirement for amenorrhoea. Partial syndrome bulimia nervosa participants (n=12) were required to fulfill all of the *DSM-III-R* criteria for bulimia nervosa, apart from the frequency and duration stipulations. In addition, six partial syndrome eating disorder not otherwise specified (PS NOS) participants were identified in the high school sample. The normal control (NC) group was randomly selected from those high school students who had a score of three or lower on the EAT, and who did not report any signs of eating disorder symptoms upon interview. The sample of eating disorder patients consisted of 30 patients attending hospital programs for the treatment of eating disorders. These FS participants required a *DSM-III-R* diagnosis of anorexia or bulimia nervosa, and were of the same age range as the non-clinical sample. While 10 FS participants were found in the high school sample, they were not included in the analyses, although the authors provide no explanation for their exclusion.

As no statistically significant differences between the BN and the AN participants were found on the variables of interest, the two groups were combined into one FS group (n=30) in further comparisons. In addition, the partial syndrome groups (PS AN, PS BN, and PS NOS) were combined into one partial syndrome group (n=51) on which comparisons were made to the FS and the NC (n=57) groups. It does not appear as

though this combined group of partial syndrome participants were assessed to see if they represented a homogenous group. Multivariate and one-way analyses of variance were followed by Tukey contrast tests to compare the groups on the measures of interest. On two of the three EDI subscales tested (Interoceptive Awareness and Ineffectiveness), as well as on a self-report measure of depressive symptoms (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), significant differences were found for all three groups such that the FS participants scored higher than the PS group, who in turn scored higher than the NC group. However, on the EDI Body Dissatisfaction subscale, the FS and the PS group were similar, and significantly more elevated than the NC group. In discussing their results, the authors emphasize that participants are often significantly affected by their condition, and efforts must be made to include them in treatment. The researchers further assert that the pattern of their results (FS>PS>NC) is in keeping with a continuum model, but caution that it is a "continuum of vulnerability based on a number of risk factors, some of which can themselves occur along a continuum...it is not a continuum based on degree of dieting *per se*." (p. 1023). They elaborate that dieting (which is a continuous variable) appears to be a necessary but not sufficient condition for the emergence of an eating disorder. Rather, it is the presence of other risk factors which create the "continuum of vulnerability" (p. 1023).

Lowe, Gleaves, DiSimone-Weiss, Furgueson, Gayda, Kolsky, Neal-Walden, Nelson, and McKinney (1996)

In a study designed specifically to evaluate the continuity model with respect to bulimia nervosa, Lowe et al. (1996) used trend and regression analyses to compare individuals with bulimia, current dieters, restrained nondieters, and unrestrained dieters with respect to general psychopathology and eating disorder symptoms. In noting that previous research investigating the continuity/discontinuity debate with respect to bulimia has produced conflicting results, the authors suggest these contrary findings may have arisen from the non-differentiation between those who chronically restrain their eating but who are not currently dieting and those who are currently dieting to lose weight. They speculate that this distinction may be important, as current dieters may present a greater risk for the development of eating disorders given that they possess two current

potential risk factors for bulimia (past and current dieting), whereas restrained nondieters share only one (past dieting).

Individuals with bulimia nervosa were solicited through a newspaper advertisement, whereas all other participants were female post-secondary students enrolled in undergraduate or graduate courses. The diagnostic status of the presenting bulimic individuals was assessed based on their responses to *DSM-III-R* criteria as operationalized in edition 11.5D of the Eating Disorders Examination (Cooper & Fairburn, 1987). Of the 21 bulimic individuals recruited, 8 did not meet the formal diagnosis of bulimia nervosa as they did not report a criterion-level frequency of objective bulimic episodes. However, these individuals were included in the study's Bulimic group, justified by the fact that of the 25 dependent measures used in the study, the only significant difference between bulimics meeting formal diagnosis and those reporting below-threshold bulimic episodes was on the overeating subscale of the EDE. The remaining three groups of participants were classified based on their current dieting status (currently dieting or currently not dieting) and whether or not they achieved a cut-off score of 15 on the Restraint Scale (Herman & Polivy, 1980). Those individuals who endorsed an item stating they were currently dieting to lose weight were classified as current dieters (n=15), and unrestrained nondieters (n=23) denied current dieting and scored lower than 15 on the Restraint Scale. Restrained nondieters (n=14) were defined as those who denied currently dieting to lose weight, but had a restraint score of 15 or above on the Restraint Scale. As a data-reduction strategy, all measures were entered into a principal components analysis, including seven of the eight original EDI subscales of the EDI-2, 10 dimensions of the Derogatis Symptom Inventory (DSI; Derogatis, 1988), the five subscales of the EDE, and data on weight and eating habits taken from the participants' self-monitoring data over six days. Four variables (including Maturity Fears from the EDI-2) were eliminated, which resulted in an overall measure of sampling adequacy (MSA, Kaiser, 1974) of .90. A three-factor solution, accounting for 71% of the total variance, was extracted, which was then rotated to allow for correlated factors. The first factor was composed of all of the DSI scales as well as the psychopathology scales of the EDI-2 (Ineffectiveness, Interpersonal Distrust, and Interoceptive Awareness). This factor was labelled *general psychopathology*. The second factor, which included two

EDI-2 scales (Drive for Thinness and Body Dissatisfaction), four scales from the EDE (restraint, eating concern, weight concern, and shape concern), and one from the food records (overeats) appeared to relate strictly to restraint/weight concerns. The third factor was comprised of the EDI-2 Bulimia scale, the EDE eating concern and overeating scales, and self-monitored binge frequency. This third factor was titled *binge eating*.

The data were then subjected to trend analyses with the three factor scores from the principal-components analysis as the dependent variables and group membership as the independent variable. The levels of the group variable were ordered *a priori* as follows: 1=unrestrained nondieters; 2=restrained nondieters; 3=current dieters; and 4=bulimics. The trend for the General Psychopathology factor was significant for the linear trend $F(1,68)=12.86$, $p<.0001$, while the tests for quadratic and cubic trends were both nonsignificant for this factor. Similar results were obtained for the restraint/weight concerns factor, with only the linear trend reaching significance $F(1, 68)=109.74$, $p<.0001$. On tests of the binge eating factor, all three types of trend (linear, cubic, and quadradic) reached statistical significance. The authors interpret this finding as consistent with the continuum model, as the discontinuity perspective would predict that a sharp (or discontinuous) increase in psychopathology would occur from the weight-concerned groups to the bulimic group. In noting that other studies have found this discontinuous increase in psychopathology between bulimic individuals and both restrained and unrestrained eaters (Laessle et al., 1989; Ruderman & Besbeas, 1992; Rossiter, Wilson, & Goldstein, 1989), the authors speculate that the difference in findings may be partially accounted for by the fact that unlike the previous studies, the bulimics in their study were not seeking treatment. In addition, it is noted that the dieters in the present study were several years older than those in previous studies, and perhaps the longer duration of dieting intensified the "adverse psychological effects associated with it" (p. 514).

As a further test of the continuity versus discontinuity models, a multiple-regression analysis was performed using restraint/weight concerns and psychopathology to predict scores on the binge eating factor. The results of the regression analysis were interpreted as supportive of the continuity model, in that the restraint/weight concerns

factor was found to predict binge eating severity when general psychopathology was controlled, but general psychopathology did not predict binge eating when restraint/weight concerns was controlled. In addition, the interaction of restraint/weight concerns and general psychopathology did not predict binge eating. The authors suggest that these results support the hypothesis that the increased psychopathology found in chronic dieters and individuals with bulimia is an effect of the weight consciousness itself. In addition, the fact that the linear trend that was found for psychopathology was no longer found when restraint/weight concerns were controlled in the regression analysis is interpreted as consistent with "the continuum model's assumption that increased psychopathology is secondary to increased eating and weight problems in weight-conscious individuals" (p. 514).

Of interest, a sharp increase in binge eating was identified which occurred only from the three non-bulimic groups to the bulimic group. Therefore, while restrained eating and current dieting were associated with elevations in the psychological symptoms associated with bulimia, they were not associated with binge eating itself. This is contrary to the predictions of the continuum hypothesis, if, as Lowe et al. state, the hypothesis "is predicated on the assumption that dieting produces measurable increases in binge eating, the quintessential symptom of bulimia" (p. 514). In addressing this result, the authors speculate that the reason for the apparent "discontinuity" in the binge eating that occurs in the restrained and dieting groups and the binge eating that occurs in the bulimic group is attributable to an insufficient severity of both dieting and weight loss in the restrained and dieting groups. They speculate that only when food restriction and weight are substantially reduced is binge eating likely to occur, and further speculate that the purging practices of the bulimic group (which were absent in the restrained and dieting groups) further perpetuate binge eating. Of note, the authors state that the results of their study suggest that "'normative' body dissatisfaction and dieting practices have negative consequences (e.g., emotional distress, lowered self-esteem) but that those consequences are unlikely to include binge eating unless substantial food restriction and weight loss occurs" (p. 514).

In discussing the potential limitations of their study, the authors note that eight of the 21 women in the bulimia group did not meet the *DSM-III-R* bulimia nervosa criterion for binge frequency. It is therefore possible that the bulimic group may have scored higher on the psychopathology (or the other two factors) had all of the bulimic participants met the diagnostic criteria. However, the authors assert that this would not have altered the results of a linear trend for this factor. A second limitation has to do with the cross-sectional design of the study, which disallows any causal conclusions regarding the relationship between dieting and bulimic symptomatology. Thirdly, the participants in the study were volunteers, and different results may have been obtained if those who chose not to participate were included in the results. Finally, the study's design used pre-selected groups, and future research was suggested to look at large, unselected populations of females at risk for bulimic symptomatology.

It is also of interest to note that the authors allude to the possible importance of a variable not studied in their analysis (purging behaviour) which may have contributed, perhaps greatly, to the sharply elevated binge eating scores of the bulimia group compared to the other two groups.

Tylka and Subich (1999)

Tylka and Subich (1999) aimed specifically to test the continuum model of eating disorders, exploring whether specific psychological, behavioural, and cognitive characteristics known to be related to clinical eating disorders varied by eating disorder continuum placement. They sought to redress one of the main limitations of previous research, namely the inconsistent and questionable definitions of groups. Tylka and Subich strived to accomplish this by utilizing a classification system based on operationalized *DSM-III-R* criteria developed by Mintz, O'Halloran, Mulholland, and Schneider (1997). In Tylka and Subich's first study, a questionnaire closely following this measure was administered to 169 female college students, and the participants were placed into one of three categories: asymptomatic (n=57), symptomatic (n=76), and eating disordered (n=36). Eating disordered participants included those individuals meeting *DSM-IV* criteria for anorexia or bulimia nervosa, as well as those who met the criteria for a *DSM-IV* diagnosis of eating disorder not otherwise specified. Participants

were placed in the symptomatic group if they acknowledged behaviours such as strict dieting or utilizing appetite suppressants, as were individuals who met all the criteria for anorexia nervosa, but had a body mass index of 17.6 or higher. Asymptomatic individuals were required to have a body mass index at or above 17.6 and had to deny engaging in binge eating, strict dieting, or the use of appetite suppressants or other purgatory behaviours.

To test the hypothesis that general psychopathology in the form of neuroticism (as measured by the NEO-FFI (Costa & McCrae, 1985), the short version of the NEO-Personality Inventory-Revised) would increase linearly across the groups, post hoc and trend analyses were utilized. As predicted, the asymptomatic group differed from the symptomatic group ($p<.001$), and the symptomatic group differed from the eating disordered group ($p<.001$) in their NEO-FFI Neuroticism scores. The trend analysis (which was conducted only for linear and not quadratic or cubic trends, as it was assumed that the continuum groups line on an ordinal as opposed to nominal scale) was significant for a linear relation between the three continuum groups on the neuroticism variable.

In Tylka and Subich's second study, a combined sample of high school and college females were again classified into three groups [eating disordered ($n=35$), symptomatic ($n=69$), asymptomatic ($n=31$)], and the EDI-2, as well as instruments designed to assess social desirability and dieting locus of control, were administered. A MANCOVA (controlling for social desirability) on the subscale scores of the EDI-2, apart from the Drive for Thinness and Bulimia subscales, indicated a significant overall group effect. Post hoc univariate comparisons indicated that the three groups all differed significantly from each other in the expected direction on the EDI-2 subscales of Interoceptive Awareness and Impulse Regulation. While no significant differences were found between the eating disorder and the symptomatic groups, each differed significantly from the asymptomatic group on the EDI-2 subscales of Body Dissatisfaction, Ineffectiveness, Maturity Fears, and Social Inhibition. No group differences were found on the EDI-2 Perfectionism and Interpersonal Distrust subscales. Trend analyses indicated that subscale mean scores increased linearly as the groups

progressed from asymptomatic to symptomatic to eating disordered on all of the EDI-2 subscales apart from Perfectionism.

In discussing the results of these two studies, the authors assert that the construct validity of the eating disorder continuum was supported in that "several variables that are significant characteristics of clinical eating disorders vary meaningfully as a function of women's placements along the eating disorder continuum" (p. 274). However, it is important to note that for several of the EDI-2 subscales (Body Dissatisfaction, Ineffectiveness, Maturity Fears, and Social Inhibition), while the asymptomatic group and the symptomatic group differed significantly, the symptomatic group and the eating disorder group were indistinguishable. The authors deal with these findings by stating that any results inconsistent with the continuity hypothesis were also inconsistent with the discontinuity perspective.

Franko and Omori (1999)

As part of their effort to systematically examine subclinical levels of eating pathology and their correlates, Franko and Omori also undertook to investigate the continuity/discontinuity debate with respect to bulimia.

Participants in the study were two hundred and seven females (with an average age of 18.5 years) enrolled in an introductory psychology course who were recruited as study participants. The *DSM-III-R* based, self-report Eating Pathology Scale (Drewnowski et al., 1994) was used to categorize participants into one of five groups. Probable Bulimics (n=14) reported binge eating and either vomiting or laxative use more than once per week over the previous month. Dieters at-Risk (n=14) were defined as those who met the criteria for probable bulimia apart from binge eating frequency in the past month. Intensive dieters (n=48) were those who reported engaging in the past month both dieting and binge eating, but no compensatory behaviours. Casual dieters (n=35) reported dieting but denied binge eating or compensatory behaviours, and non-dieters (n=105) were defined as those who reported neither dieting nor binge eating in the previous month. Dependent measures included the Beck Depression Inventory (BDI; Beck et al., 1961), the Bulimic Automatic Thoughts Test (BATT; Franko & Zuroff,

1992), the Eating Disorder Inventory-2 (EDI-2; Garner, 1991), and the Impulsivity Inventory (IMP; Dickman, 1990). This study proposed, in the authors' words, to investigate the continuity hypothesis "by examining whether eating pathology and its related correlates lie on a spectrum, such that probable bulimics would score the highest, and non-dieters would score the lowest, on each of the variables that were assessed" (p. 390). As such, it was predicted that a decreasing pattern of pathology would be observed across the five groups in terms of their depression, impulsivity, dysfunctional weight-related thoughts, and disturbed eating attitudes.

As body mass index (BMI) was found to significantly differ between the groups, analyses of covariance were conducted on the dependent measures using BMI as a covariate, and results indicated significant differences among the groups on each of the dependent measures (BDI, BATT, EDI-2, IMP). However, the authors also state that as there were no differences between the scores of the probable bulimics and the dieters at risk on any of the measures, the two groups were combined for subsequent analyses. Tukey multiple comparison tests identified that on the BATT, the only significant difference observed was between the combined probable bulimic/dieter at risk group and the other three groups ($p<0.05$), and on the IMP, only the casual dieters and the Intensive dieters differed significantly ($p<0.05$). With respect to depression, the combined probable bulimics/dieters at risk group scored significantly higher than casual dieters ($p<0.05$) on the BDI. Each univariate analysis on the eight EDI-2 subscales identified significance at the 0.001 level apart from the Perfectionism ($p<0.05$) and Maturity Fears ($p<0.10$) subscales. The authors then report that "Tukey multiple comparison tests revealed predicted patterns on most of the subscales" (p. 393), but then go on to report differences that do not appear to be in keeping with this assertion. It is reported that that the combined bulimic and dieters-at-risk groups scored significantly higher than the other three groups on the Drive for Thinness, Bulimia, Ineffectiveness, and Interpersonal Distrust subscales, thus presumably the other three groups did not demonstrate significant differences on these variables as was predicted. In addition, the authors report that the non-dieters group scored significantly lower than the other three groups (who presumably did not differ from each other) on the EDI-2 subscales of Body Dissatisfaction, Interoceptive Awareness, and Perfectionism. They then go on to

conclude that "support for the continuity hypothesis [was] attained in this study...greater eating pathology was associated with higher levels of depression, dysfunctional cognitions, and disordered eating attitudes" (p. 393).

Franko and Omori's interpretation of support for the continuity model appears flawed on several counts. Most importantly, the model of continuity is an assertion regarding the relationship between diagnostic levels of anorexia and/or bulimia nervosa and the range of eating pathology that falls below these levels. However, the instrument used for classification in this study does not allow for a diagnosis of anorexia or bulimia nervosa. Using Franko and Omori's criteria, which in fact only captured five participants within the probable bulimic category, an individual can meet the probable bulimic classification by evidencing binge eating or compensatory behaviour at a frequency or duration level below those specified in the *DSM-IV* criteria. As such, it would seem unreasonable to assume that this study can purport to address the continuity debate given that it is questionable as to whether the five individuals they identify as probable bulimics have diagnostic levels of bulimia nervosa. Further, the group most equivalent to a subclinical group, namely the dieters at-risk, were collapsed into one group along with the probable bulimics, further complicating the matter. Beyond these serious limitations, the results reported themselves do not appear to be consistent with the continuity hypothesis. Rather than the expected finding of significant increases on the dependent variables as one moves along a hypothesized continuum from the non-dieter to the casual dieter to the intensive dieter and finally to the combined dieter at-risk and probable bulimic group, the reported results indicate that differences, when found, tend to exist between one of the groups and the other three groups combined, who themselves did not differ.

Fitzgibbon, Sanchez-Johnsen, and Martinovich (2003)

In response to the fact that no research to date had investigated the continuity/discontinuity debate with respect Binge Eating Disorder (BED), Fitzgibbon et al. sought to assess whether differences in core eating pathology (i.e., thinness drive, current body image ideal, and body dissatisfaction) and psychiatric symptoms distinguish individuals on a binge eating spectrum. The sample included 375 females

aged 18 and older who were obtained from an outpatient treatment program in a university-based eating disorders clinic. Participants were classified into one of five groups: treatment-seeking obese nonbinge eaters (n=59), subthreshold BED (n=59), BED (n=64), subthreshold bulimia (n=105), and bulimia nervosa (n=123) on the basis of their responses to the Questionnaire on Eating and Weight Patterns (QEWP, Spitzer et al., 1992) which assesses the duration and frequency of eating behaviours consistent with *DSM-IV* criteria for both BED and bulimia nervosa. Clinical interviews following the completion of this measure generated diagnoses of either subthreshold or formal BED or bulimia nervosa. Dependent measures included the Drive for Thinness and the Body Dissatisfaction subscales of the Eating Disorder Inventory-2 (Garner, 1991), the Beck Depression Inventory (Beck et al., 1961), and the Interoceptive Awareness subscale of the EDI-2, which was chosen as a measure of psychopathology due to its strength in measuring the "general organizing constructs of psychological traits clinically relevant to eating disorders," and its "ability to tap general psychopathology related one's personal response to emotional states" (p. 88).

A discriminant function analysis was conducted using the six predictor variables to predict group membership, and two significant functions were identified. The first function, accounting for 91.0% of scale variance was identified as a core eating disorder pathology factor, with Body Image Ideal, and the EDI-2 Drive for Thinness and Interoceptive Awareness subscales demonstrating the highest correlations with this function (r=.62, .68, and .54 respectively). Group differences on this function were significant (p<.001), and student Newman-Keuls range tests identified that significant differences exist on this function between all five of the groups, sequentially as consistent with continuity perspective (obese nonbinger, subthreshold BED, BED, subthreshold bulimic, and bulimic). On the second identified function, which accounted for a further 4.9% of the variance, higher scores were associated with lower levels of pathology on depression, thinness drive, and interoceptive awareness (similar to function 1), but higher levels of pathology on body image ideal, body dissatisfaction, and current body image. On Function 2, the group means were ordered, from lowest to highest, in the following sequence: BED, bulimia, subthreshold BED, obese nonbingers, and subthreshold bulimia. However, student Newman-Keuls range tests indicated that

the only significant group differences on function two were between the BED group and both the obese non-bingers and the subthreshold bulimics, whose mean scores exceeded that of the BED group on that function.

The authors point out that it is worth noting that current body image and body dissatisfaction loaded highly on discriminant function two, and in the opposite direction relative to function one. Their explanation points to a relatively large discrepancy between BED and subthreshold bulimia on body dissatisfaction and a lack of differentiation between the obese nonbingers and the BED groups. While subsequent ANOVAs and associated range tests identified some patterns not in keeping with the continuity hypothesis, any findings not consistent with continuity perspective were dismissed by the authors in the following assertion:

> These variables did not show substantial discrepancies that would suggest inconsistencies in the continuity model. Instead, the pattern of means on this set of variables is primarily driven by function 1 (accounting for 91% of the variance), which left little room for substantial discontinuity on any of the included variables. (p. 92)

In their summation, the researchers state that with respect to a treatment-seeking population, the differences found between the five groups on both core eating pathology and psychiatric symptoms are more consistent with a continuity model than with a discontinuity model, suggesting that the groups differ from each other quantitatively rather than qualitatively.

Research Not Supportive of the Continuity Model

Studies Not Utilizing the Eating Disorder Inventory

Thompson and Schwartz (1982)

In response to Nylander's (1971) assertion that the symptoms of anorexia nervosa occur on a continuum, Thompson and Schwartz investigated anorexia-like

behaviour in a non-clinical sample to assess its resemblance to anorexia nervosa. They sought to determine the extent to which varying levels of eating disordered behaviour affect the life functioning of adolescent girls and young adult women. The three experimental groups included an anorexia nervosa group (*N*=26), a normal weight anorexia-like group (*N*=25), and a symptom free group (*N*=25). While the clinical group is described as outpatient primary anorexics, it is unclear from the authors' description how this group was obtained. What is reported is that the Feighner criteria (1972) were used to select the primary anorexia nervosa groups, and that the criteria were slightly modified to allow for the inclusion of women who were now within the normal weight range, but who had been below 25% of average body weight for height and age in the last 12 months (i.e., a recovered or remitted anorexic group). The normal weight anorexia-like and problem-free women were selected from psychology and sociology classes at a private, co-educational, liberal arts college in the Midwestern United States. Selection and classification of participants was made using the women's' scores on the Eating Attitudes Test (EAT) (Garner & Garfinkel, 1979). The normal weight anorexic-like group consisted of those participants with a score of 25 or higher on the EAT measure, and a weight within 10% of the expected range based on their height, age, build, and blood pressure. The problem-free normal group were chosen based on a score of 10 or less on the EAT measure, and a weight within 10% of the expected range for their height and age. Notably, of 47 potential problem free participants, three were removed due to obesity, and a further 18 were excluded without explanation.

Social adjustment was assessed using four sub-scales (work, social-leisure, relations with family, and global rating) of the Weissman Social Adjustment Scale (Weissman & Paykel, 1974). Psychological distress was assessed using the anxiety, somatisation, hostility, and psychoticism, as well as the general index of the Symptom Check List 90 (SCL-90) (Derogatis et al., 1974). Mood was assessed using the Beck Depression Inventory (Beck, 1961), and all participants were "given a long interview concerning body, food, dieting, eating-disorder behaviour, family attitudes toward food and body, and menstrual and sexual history" (p. 51).

In the authors' opinion, the most dramatic finding of the study was the prevalence of anorexic-like behaviour among normally-functioning college women, particularly the behaviours of binge-eating and self-induced vomiting. Dieting was found to be widespread among the anorexic-like and to a lesser extent, the problem-free women. In comparing the results (ANOVAs and post-hoc comparisons) obtained from between-group comparisons on the measures of adjustment, Thompson and Schwartz summarized that:

> while women manifesting high levels of anorexic-like behaviour display more symptomatic distress (as measured by the SCL-90) than college women without such behaviour, women with diagnosable anorexia nervosa are, on all dimensions of life adjustment and symptomatic distress, far more profoundly affected than the anorexic-like women. (p. 58)

That is, while "anorexic patients led lives of extreme social deprivation, with few friends and difficulties with relatives and co-workers...the anorexic-like women led lives as full and successful as those of the problem-free group" (p. 58). Although the authors did not explicitly address the continuity/discontinuity debate, their results indicated that eating and body concerns in non-anorexic individuals, while not adversely affecting social adjustment, are related to symptoms of anxiety, mild depression, and overall mild symptom distress as measured by the SCL-90. However, their primary emphasis was on the fact that many of the women manifest high levels of anorexic symptomatology without corresponding high levels of difficulty with life adjustment, suggesting that there are important, qualitative differences between many of the women with high anorexic-like attitudes and true anorexic patients.

Katzman and Wolchik (1984)

The stated aim of this study was to assess a number of the behavioural and psychological dimensions that had been implicated by theorists as important in the onset of bulimia but had not yet been empirically investigated. Participants were recruited from undergraduate introductory psychology classes, and each completed a questionnaire that operationalized the *DSM-III* criteria for bulimia. Women who fulfilled all of the criteria were classified as bulimic (N=30), while women who reported eight or more

episodes of binge eating a month, but failed to meet one or more of the other operationalized criteria were classified as binge eaters (*N*=22). The control group (*N*=28) consisted of individuals who responded negatively to the initial screening questions of: "do you binge eat?" and "do you frequently consume large amounts of food in short periods of time other than meals?" (p. 424).

Participants were then compared on various indices including those measuring binge eating (Hawkins and Clement Binge Eating Scale; Hawkins, & Clement, 1980), restraint (The Revised Restraint Scale; Polivy, Herman, & Warsh, 1978), depression (BDI; Beck, 1971), social competence (Levenson and Gottman Dating and Assertion Questionnaire; Levinson & Gottman, 1978), self-esteem (Rosenberg Self-Esteem Index; Rosenberg, 1979), and measures of self-perception. One-way multivariate analysis of variance was used to compare the three groups on each of the standardized measures, with multiple post hoc comparisons using the Newman-Keuls procedure. Bulimics scored in a more pathological direction than binge eaters on measures of restraint, binge eating, depression, demand for approval, self-esteem, and body attitudes. They also reported lower self-esteem and poorer body attitudes than the control group. Most notably for our purposes, the comparisons between binge-eaters and controls resulted in only two significant differences, namely levels of dieting preoccupation and binge-eating. Therefore, on all other variables assessed, the subclinical group and the group of normal controls did not differ, which is inconsistent with a model of continuity. In light of their findings indicating differing levels of pathology in the bulimic and the binge-eater groups, Katzman and Wolchik interpret their results as supportive of the theory that bulimia and binge eating "reflect two distinct variants in a spectrum of eating disorders" (p. 427). While not directly interpreted by the authors as such, the results of this study have been cited by others as evidence for the discontinuity model of bulimia, as the subthreshold group (binge-eaters) did not differ from the controls on the measures of psychopathology, but both of these groups differed significantly from the bulimic group.

Ruderman and Grace (1988)

In a study designed to compare the psychological characteristics of restrained eaters and bulimics, Ruderman and Grace (1988) identified many similarities, but also

important differences, between the clinical and non-clinical groups. The variables of narcissism, borderline personality disorder, psychoticism, neuroticism, psychopathy, general maladjustment, self-esteem, and body image were examined. A sample of 136 female college undergraduates completed several measures, including the Revised Restraint Scale (Herman, Polivy, Threlkeld, & Munic, 1978), the Bulimia Tests (BULIT) (Smith & Thelen, 1984), the Tennessee Self-Concept Scale (Fitts, 1964), the Narcissistic Personality Disorder Scale (Ashby, Lee, & Duke, 1979, cited in Ruderman & Grace, 1988), the Body Cathexis Scale (Jourard & Secord, 1955), and a measure of borderline personality disorder developed from the MMPI (the Borderline Scale; Lloyd, Overall, Kimsey, & Click, 1983).

Four stepwise regression analyses were performed, to predict (a) BULIT scores, (b) restraint scores, (c) concern with dieting, and (d) weight fluctuations. On the first function (BULIT), physical self-esteem, narcissism, and general maladjustment accounted for 33% of the variance in BULIT scores. The predictor variables on the second function, restraint, accounted for 29% of the variance in restraint scores, and included measures of physical self-esteem, narcissism, and moral-ethical self-esteem. Narcissism, physical self-esteem, and moral self-esteem accounted for 33% of the variance on the third factor (concern with dieting), whereas only the variable of physical self-esteem (accounting for 11% of the variance), entered in the regression equation on the fourth (weight fluctuations) factor. While similar variables were important in predicting both bulimia and restraint (including physical self-esteem and narcissism), important differences were also identified. First, bulimia, but not restrained eating, was predicted by an element of psychopathology (reflected in the general maladjustment scale of the TSCS), but the nature of the psychopathology is unclear "as it was reflected in the general maladjustment scale, rather than in the borderline scale as predicted, or in any of the other specific psychopathology scales (e.g., neurotic, psychotic)" (p. 367). This pattern of these results obtained by Ruderman and Grace has been cited as supportive of the discontinuity hypothesis, as a different set of predictor variables is needed to distinguish between the clinical eating disorder (bulimia) and the sub-clinical group.

Steiger, Leung, Ross, and Gulko (1992)

Steiger and colleagues investigated a sample of high school girls using clinical interview to assess *DSM-III-R* status with respect to anorexia nervosa, bulimia nervosa, major depression, and dysthymia. A subset of 160 girls from the prospective study were selected for interview based upon their scores on measures of eating attitudes (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) and depression (the Depression subscale of the Symptom Checklist-90-Revised [SCL-90-R; Derogatis, 1977)]. Groups were then formed on the basis of cut-off scores on these two measures, to yield the following groups: high eat-26/mood (*N*=31), high eat-26 (*N*=54), low eat/mood (*N*=75). Assessment of *DSM-III-R* status with respect to eating disorder and mood diagnoses were then made using the Structured Clinical Interview for *DSM-III-R*, Outpatient Version (SCID-II-OP; Spitzer, Williams, Gibbon, & First, 1987). Scoring was done according to the SCID-II-OP protocol, with each symptom given a rating score of 2 (present), 1 (subthreshold), or 0 (absent). Symptom scores for each diagnosis were then summed to form *sign* scores for the four diagnoses (ranging from 0-8 for anorexia, 0-10 for bulimia, 0-16 for dysthymia, and 0-18 for depression).

Results from univariate ANOVAs and subsequent Scheffe comparisons across groups indicated that the high eat group did not display any greater number of eating disorder signs on interview than the low eat/high mood group. Further, it was found that the girls reporting the combination of eating and mood disturbances (high eat/mood group) reported more signs of anorexia and bulimia nervosa upon interview than those who reported either eating symptoms alone (high eat) or those who denied symptoms of either eating disturbances or mood (low eat/mood). In discussing their results, the authors suggest that as their results indicate that signs of the clinical eating disorders occur predominantly in the participants with mood and eating symptoms, this supports the concept that "clinical-spectrum eating disturbances exist as an 'eating-mood syndrome' which can be identified in varying severities in a nonclinical female population" (p. 148). Although they do not explicitly address their findings in terms of the continuity versus discontinuity debate, the result that the highest concentration of *DSM-III-R* eating disorder signs are found predominantly in the group with combined eating

and general pathology (as captured in this study as depressed mood) have been read as supportive of discontinuity. The authors do caution, however, that few girls in their sample met full *DSM-III-R* criteria for an eating disorder upon interview, and that future efforts should look toward determining whether individuals who evidence both mood and eating disturbances are in fact more vulnerable to the development of full eating disorders.

Research Finding Mixed Results

Studies Not Utilizing the Eating Disorder Inventory

Dykens and Gerrard (1986)

Dykens and Gerrard (1986) sought to address the paucity of research that had compared women with bulimia and women who diet but do not binge and purge. Participants were obtained from a university undergraduate sample, and classified on the basis of their responses to a questionnaire developed by the investigators to identify potential bulimics, repeat dieters, and nondieters. The questionnaire included questions on height, weight, the number of diets and weight fluctuations in the past year, current dieting status, degree of satisfaction with current weight, concerns about eating, and their need to be thin. In addition, individuals were asked to rate the frequency of their binging and purging behaviours. Those who were identified as exhibiting bulimic tendencies were interviewed by telephone for a diagnostic interview to assess *DSM-III* diagnostic status. Participants were then selected for inclusion into one of three groups; bulimic (n=29), repeat dieters (n=254), and nondieters (n=110). Both non-bulimic groups were classified on the basis of their responses to the screening questionnaire.

The questionnaire battery included the Tennessee Self-Concept Scale (Fitts, 1965), the Traditional Role Scale (Rosen & Martindale, 1978), Rotter's Internal-External Locus of Control Scale (Rotter, 1966), the Personality Attributes Questionnaire (Spence

& Helmreich, 1978) and the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1966).

Comparisons of the groups on each of the nine MMPI scales, indicated that bulimics scored higher than the repeat dieters on all but three of the subscales. Tests of the 10 Tennessee Self-Concept Scale (TSCS) subscales revealed that for 7 of the 10 subscales, bulimics and repeat dieters were similar, and each had lower levels of self-esteem than their non-dieting peers. A step-wise discriminant function analysis revealed two significant functions, only one of which the authors report in detail. This function, which separated all three groups and accounted for 78% of the predicted variance, included physical self-esteem, the MMPI Psychopathic Deviate scale, and the MMPI Hypomania scale as the most powerful discriminating variables (with standardized discriminant function coefficients of -.68, .46, and .36, respectively). In interpreting the results of Study 1, Dykens and Gerrard point to the fact that while bulimics and repeat dieters share a number of characteristics, bulimics score higher on several clinical measures than do women who are equally dissatisfied by their weight but who demonstrate less extreme eating behaviour. They then suggest that "the poor self-esteem evident in both groups dissatisfied by their weight may be aggravated among bulimics by other personality characteristics" (p. 284).

In a second study, current bulimics (n=27) were compared to historic bulimics, (n=12), repeat dieters (n=31) and nondieting controls (n=52). The historic bulimics group consisted of those individuals who recently met the *DSM-III* criteria for bulimia, but while acknowledging occasional binging, denied purging in the past 6 or more months. Results of the second set of analyses were similar to those found in the first study, with physical self-esteem and MMPI Psychopathic Deviate scores being of the greatest predictive utility in separating groups on the discriminant function identified. However, the Identity scale of the TSCS and the Hypochondriasis scale of the MMPI also emerged as factors in this function. Together, these variables accounted for 76% of the variance in group scores.

In terms of the continuity/discontinuity debate, the fact that psychopathological variables were important to the discriminant functions identified in these studies has

been read by some as consistent with the continuity hypothesis. However, perhaps the finding of greatest interest is that few significant differences were found between current and historical bulimics, but both were significantly different from the repeat dieter and dieter control groups on many measures. On the basis of this result, the authors hypothesize that "it is possible that the historical bulimics are in remission (i.e., they currently have control over their eating behaviour) but that the personality characteristics that made them prone to bulimia are still in place" (p. 287). This interpretation is clearly in line with the discontinuity perspective. A second relevant result was the finding that both repeat dieters and bulimics share a profile of having both low self-esteem and an external locus of control, which the authors note "supports suggestions from case studies that women with eating disorders suffer from feelings of ineffectiveness and lack of control over life decisions" (p. 288). However, as the repeat dieters constitute the subclinical group in this study, the finding that they do not differ from the bulimic group on the variables of self-esteem and locus of control is supportive of neither continuity or discontinuity.

Ruderman and Besbeas (1992)

Ruderman and Besbeas (1992) undertook an investigation to test the continuity and discontinuity models as they apply to the relationship between dieting and bulimia nervosa. In the first study, 19 bulimics [defined by achieving a score at or above the diagnostic cut-off of 102 on the BULIT (Smith & Thelen, 1984)] were compared to 21 dieters (scoring above 17 on the Restraint Scale [Herman, Polivy, Pliner, Threlkeld, & Minic, 1978)] and 33 nondieting controls (who scored below 13 on the Restraint Scale). Participants were assessed on measures "on which bulimics have shown disturbances" (p. 384), including anxiety, depression, assertiveness, self-esteem, body image, social desirability, anger, suspiciousness, and obsessive-compulsive characteristics.

A MANOVA on the seven tests administered as dependent measures and Participant classification (as bulimic, dieter, and control) as the independent variable was significant, and pair-wise multivariate comparisons were performed. Bulimics differed significantly from dieters, who in turn differed significantly from controls. One-way univariate analyses and post hoc comparisons of group means revealed that bulimics

were significantly more disturbed than controls on 18 of the 24 measures, and more disturbed than dieters on 16 of the measures. On only one of the scales did dieters differ significantly from controls. A discriminant function which included dieters and bulimics identified one function of significance [$F(24,15)=4.76$, $p=.0015$], with the best predictors in distinguishing bulimics from dieters being body image, depression, and SCL-90 Interpersonal Sensitivity scales (with all correlations among these scales and the discriminant function being above .50). A number of other predictors, all with correlations above .3, were identified, including: somatisation, obsessive-compulsive, depression, anger, paranoid ideation, and psychoticism scales from the SCL-90; and the personality disorder, neurosis, general maladjustment, defensive positive, moral self-esteem, personal self-esteem, and self-criticism scales from the Tennessee Self-Concept Scale. A second discriminant function was performed to identify variables important in discriminating dieters from controls, and this function [$F(24,27)=2.50$, $p=.0114$] identified the Marlowe-Crowne Social Desirability Scale (Crown & Marlowe, 1960), the SCL-90 Depression Scale, and the TSCS Defensive Positive, Personal Self-Esteem and Family Self-Esteem scales as having correlations with the discriminant function above .30. The results of this first study did not unequivocally support either the continuum or the discontinuity hypothesis, but appear to be more consistent with the latter, as "the number, pattern, and size of the differences between nondieters and dieters was different than the number, pattern, and size of the differences between dieters and bulimics" (p. 387).

A second study was undertaken, with participants completing the same battery of questionnaires used in the first study. A principal-components factor analysis was performed, and based on the scree test, three factors were extracted and subjected to a varimax rotation. The first factor, labelled psychopathology, had high correlations with the nine SCL-90 scales, the Beck Depression Inventory, and the Taylor Manifest Anxiety Scale. Variables loading highly on the second factor, labelled self-concept, were the college self-expression scale, the body image scale, and all but the Self-Criticism and Psychoticism subscales of the TSCS. The third factor, defensiveness, was characterized by positive loadings for the psychoticism, defensive positive, and self-criticism scales of the TSCS and the Marlowe-Crowne Social Desirability Scale. In an

attempt to identify important predictors to dieting, a stepwise regression analysis was performed using restraint scores as the dependent measure and the three factor scores (psychopathology, self-concept, and defensiveness) as predictor variables. Defensiveness entered the equation first, followed by psychopathology, and together they accounted for 23% of the variance in restraint scores. A similar procedure was taken to determine important predictors to bulimia, using BULIT scores as the dependent measure and the three factor scores as predictors. Psychopathology entered the equation on the first step, self-esteem on the second step, and defensiveness on the third. Together, the three variables accounted for 28% of the variance in BULIT scores. A further regression analysis was undertaken with restraint scores being forced into the equation at the first step, which accounted for 49.7% of the BULIT score variance. The addition of self-concept at the second step and Psychopathology at the third step resulted in an increase in BULIT score variance prediction to 54%. The authors interpret the results of the second study as providing support for both the continuum and discontinuity hypotheses. First, both bulimia nervosa (which they define as high BULIT scores) and dieting (as measured by the restraint scale) were significantly predicted by psychopathology and defensiveness. However, the self-concept factor predicted BULIT scores but not restraint. In addition, the fact that self-concept contributed significantly to the regression equation of BULIT even after restraint was forced in as a covariate is "consistent with the hypothesis that bulimia is more than an extreme point on a continuum of dieting" (p. 388). Ruderman and Besbeas further state that bulimics "show more pervasive and higher levels of disturbance than do dieters. They are characterized by psychopathology and deficits in self-esteem above and beyond that which can be attributed to dieting" (p. 389). The authors address the overall implications of their results as suggesting that "perhaps dieting contributes to the development of bulimia nervosa in psychologically vulnerable individuals. It seems that a continuum and discontinuity model fits the data better than either a continuum model or a discontinuity model" (p. 389).

Drewnowski, Yee, Kurth, and Krahn (1994)

Drewnowski et al. (1994) conducted a longitudinal survey study of 557 college females in order to assess the course of subthreshold levels of bulimia nervosa over time. They utilized a questionnaire instrument which included items to assess *DSM-III-R* criteria for bulimia nervosa, addressing the following symptoms: dieting and binge eating frequency, as well as the use of fasting, laxatives, diuretics, and self-induced vomiting for weight control. The baseline measure was obtained in the fall, having recruited from a potential total sample of 2,222 women (freshman) living in college residence halls. Complete data were obtained from 902 students. Follow up was conducted six months later with the same group, yielding a total of 557 women who completed both surveys.

Participants were classified into one of five categories based on their responses to the self-report measure of eating disorder symptomatology. Probable bulimics (n=19) were defined as those who reported binge eating more than once a week during the previous month, and who reported dieting, fasting, using laxatives or self-induced vomiting during the previous month. Dieters at risk (n=55) were defined as those who met all of the criteria for bulimia nervosa apart from binge eating frequency. Individuals who acknowledged dieting and/or binge eating, but denied any fasting, vomiting, laxative or diuretic use were classified as intensive dieters (n=162). Casual dieters (n=245) were defined as those women who reported dieting by restricting calories, skipping meals, or avoiding sweets, starches, and fats, but who denied binges. Lastly, women who denied both dieting and binge eating were classified as nondieters (n=76). Changes in category status over the 6-month period were then assessed.

The authors found that 4% of intensive dieters and 15% of dieters at risk moved to the bulimic category, which suggests that subclinical eating disordered behaviour does indeed lead to the development of a clinically diagnosable eating disorder in some individuals, and would seem to provide support for the continuum hypothesis of eating disorders. In all cases of bulimia, it was found that fasting, binge eating, and purging preceded the onset of diagnosable bulimia by six months, and in no cases did individuals from the casual dieter or nondieter categories move to the bulimic category. Although in all categories, a large percentage of people retained the same classification

as they had at baseline, when shifts occurred between categories, they tended to occur between adjacent categories in both directions for all the participant groupings, which the authors interpret as providing support for a continuum model of eating pathology. For example, by the end of the six-month period, 30% of the nondieters had moved to the casual dieter category, 11% of the casual dieters had moved into the intensive dieter category, 9% of the intensive dieters had moved to the dieters at risk category, and 15% of the dieters at risk had progressed to the bulimia nervosa category. However, the authors highlight the finding that only 15% of the dieters-at-risk became bulimic, and suggest that this result necessitates further research into the social and psychological factors that are important in the development or prevention of eating disorders. This suggestion is consistent with the discontinuity perspective.

Mintz, O'Halloran, Mulholland, and Schneider (1997)

Mintz and her colleagues, stressing the importance of using a *DSM*-based measure of eating disorder status, developed the Questionnaire for Eating Disorder Diagnoses (Q-EDD) (using the Weight Management Questionnaire of Ousley, 1986 as a base) to operationalize the eating disorder criteria of the *DSM-IV*. In discussing the need for such an instrument, the authors pointed to the limitations of other measures which operationalize *DSM* criteria, one of which involves the use of dichotomous decision rules (that is, participants either meet or do not meet a specific criteria) which then precludes the measure from yielding continuous data.

On the basis of decision rules (many on 5-point Likert ratings) on the Q-EDD, participants were placed into one of the following diagnostic categories:

1. asymptomatic (no eating disorder symptoms)
2. symptomatic (some eating disorder symptoms but no *DSM-IV* diagnosis)
3. eating disorder
   a) bulimia nervosa (*DSM-IV* diagnosis)
   b) anorexia nervosa (*DSM-IV* diagnosis)
   c) subthreshold bulimia (*DSM-IV* EDNOS)
   d) menstruating anorexia (*DSM-IV* EDNOS)

e) nonbinging bulimia (*DSM-IV* EDNOS)
f) binge-eating disorder (*DSM-IV* EDNOS)

In order to test the psychometric properties of the Q-EDD, three separate studies were conducted, each aimed at evaluating the reliability and validity of the Q-EDD. The first two studies obtained participants from a university sample whereas in the third study, individuals were recruited by therapist referral. In all studies, participants were placed into one of the aforementioned categories on the basis of their responses on the Q-EDD. A selection of individuals from each group was interviewed using the Structured Clinical Interview for Axis I *DSM-IV* Disorders (SCID) for Module H (Eating Disorders; First, Spitzer, Gibbon, Gibbon, & Williams, 1994) to confirm eating disorder status. Convergent and incremental validity of the Q-EDD was established by the diagnoses it generated and corresponding scores on both the BULIT-R (Thelen et al., 1991), a self-report measure of bulimia, and the Eating Attitudes Test (EAT; Garner, & Garfinkel, 1979), which was designed to differentiate anorexic and non-eating disordered individuals. Criterion validity was established by the strong accuracy rates of assessing *DSM-IV* eating disorder status demonstrated by the Q-EDD when compared to diagnoses obtained through clinical interview and judgement.

In referencing the research investigating the continuity and discontinuity hypotheses of eating disorders, the authors propose that the Q-EDD represents a useful measure for generating a 3-point eating disorder continuum of groups. The authors state that support for the Q-EDD as a 3-point eating disorder continuum measure was obtained in Study 1, where ANOVA and post hoc contrasts of group means on the EAT increased from the asymptomatic (n=83) to the symptomatic (n=20), and from the symptomatic to the eating disordered (n=33) groups. However, they note that in Study 2, the asymptomatic group (n=110) had significantly lower EAT scores than the symptomatic (n=46) and eating disordered (n=11) groups, but the latter two groups did not differ from each other, and this result "does not provide as strong support for this 3-point continuum notion" (p. 76). Nonetheless, Mintz et al. maintain that the Q-EDD could assist further research on the eating disorder continuum, and suggest that future efforts be directed towards validating the Q-EDD as a 3-point continuum measure.

Studies Utilizing the Eating Disorder Inventory

Garner, Olmsted, and Garfinkel (1983)

Garner, Olmsted, and Garfinkel were the first researchers to empirically investigate whether the core psychological features of anorexia nervosa identified by theorists as important to the etiology of the disorder also existed in those with less severe levels of eating disturbance. Their study was a direct test of the continuity hypothesis, in that they sought explicitly to determine whether anorexia nervosa represents an extreme point of a continuum, or whether there were important differences between those with high levels of weight concern and those with a clinical disorder. Participants in the non-clinical group were sampled from college student and ballet student populations. They were divided into weight-preoccupied (WP; n=38) and not weight-preoccupied (NWP; n=137) on the basis of their degree of dieting and weight concern as measured by their scores on the Drive for Thinness (DT) subscale of the Eating Disorder Inventory (EDI; Garner, 1991). This subscale measures preoccupation with body weight, excessive concern with dieting, and a morbid fear of becoming fat. In order to be classified as weight-preoccupied, individuals had to obtain a score at or above the anorexia nervosa patient mean score of 15 on the DT scale. The non weight-preoccupied group consisted of those non-clinical individuals who scored below the 50th percentile on the DT scale for their respective groups (ballet students and college students). A comparison group of anorexia nervosa (AN) patients (n=49) was obtained from the Clarke Institute of Psychiatry, and was heterogeneous in that 20 patients were of the "restrictor" subtype, while the remaining 29 patients reported the presence or history of some bulimic symptoms.

When comparisons were made between the anorexia and the weight-preoccupied groups using the chi-squared statistic, the proportion of weight-preoccupied participants scoring below the anorexic subscale means were significant only on the EDI subscales of Ineffectiveness and (lack of) Interoceptive Awareness. This finding was interpreted as being consistent with Bruch's (1962, 1973) theory that the primary deficit of feelings of ineffectiveness, and the resulting perceptual and conceptual disturbances

which follow, are core etiological features of anorexia nervosa. When comparing the weight-preoccupied and the non weight-preoccupied groups, significant differences were obtained on all EDI subscales apart from Interpersonal Distrust. A further analysis was undertaken on the weight-preoccupied group in order to identify distinct (as opposed to hierarchical) subgroups of weight preoccupied individuals. A cluster analysis procedure identified two-clusters, with average within-cluster similarity coefficients of 0.27 and 0.35, and a between-cluster similarity coefficient of 0.24. The first cluster identified 16 of the 38 WP individuals, who exhibited elevated scores on all eight of the EDI subscales, but were lower than the anorexia group on the Ineffectiveness subscale. Cluster 2 captured the remaining 22 WP participants, and was characterized by elevated scores on the Drive for Thinness, Body Dissatisfaction, and Perfectionism subscales, but scores within the typical range for female college students on the remaining EDI subscales. These results were interpreted as indicating that among females with high degrees of weight preoccupation, only some exhibit the psychological correlates associated with eating disorders and can be considered to be at risk. Other weight-preoccupied individuals only superficially resemble patients with eating disorders, and these individuals likely correspond to the normal dieters originally described by Button and Whitehouse (1981). In light of their findings, Garner et al. emphasized the importance of evaluating individuals on the basis of both behavioural and psychological symptoms, and suggested that the motivations for the pursuit for thinness likely differ for at risk individuals (e.g., basic personality or ego deficits) and simple chronic dieters (e.g., to achieve greater attractiveness). Explicitly addressing the question of a continuum of disorder, the authors assert that in the case of anorexia nervosa, "the continuum of weight-related concerns is not parallel to the continua of psychopathology" (p. 19).

Garner, Olmsted, Polivy, and Garfinkel (1984)

In an extension of the previous study, Garner et al. (1984) compared groups of weight-preoccupied (WP; n=35), non weight-preoccupied (NWP; n=134), and anorexic (AN; n=50) women on their EDI profiles, and obtained similar results. Univariate F tests revealed significant differences on all EDI subscales, and planned t-tests were undertaken comparing the WP, NWP, and AN groups' mean scores on each of the

subscales. Results showed that the AN and the WP groups did not differ in terms of Body Dissatisfaction, Bulimia, Perfectionism, or Maturity Fears, but the AN group scored significantly higher on subscales of Ineffectiveness and Interoceptive Awareness. Interpersonal Distrust means were indistinguishable among the NWP and the WP groups, and were significantly lower than that of the AN group.

In order to examine the importance of each subscale in distinguishing among the NWP, WP, and AN groups, a stepwise three-group discriminant function analysis was performed. Two discriminant functions were found to be statistically significant, the first which primarily separates the NWP from the AN and the WP groups, and the second which separates the three groups from each other equally. This two discriminant function solution accounted for 70% of group variance and allowed 81% of the participants to be correctly classified.

As in the earlier (1983) Garner et al. study, a cluster analysis was performed using an iterative optimization technique to observe distinct (as opposed to hierarchical) subgroups of WP participants, should they exist. Again, a two-cluster solution was chosen to describe the WP group, with average within-cluster similarity coefficients of 0.27 and 0.35 and a between-cluster similarity coefficient of 0.21. Univariate *F* tests indicated significant differences ($p<.05$) among the two WP clusters and the AN patients on seven of the eight EDI subscales. Cluster 1 was composed of 11 of the WP participants, and scores for this group were elevated on all of the EDI subscales. Cluster 2 captured the remaining 24 WP participants, who had elevated scores only on the Drive for Thinness, Body Dissatisfaction, and Perfectionism subscales, but scored significantly lower than both the AN group and the Cluster 1 WP group on the EDI subscales of Ineffectiveness, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears. Univariate *F* tests indicated significant differences ($p<.05$) among the two WP clusters and the group of anorexia nervosa patients. The Cluster 1 WP group resembled the AN group on the EDI subscales of Ineffectiveness, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears, with both of these groups scoring higher than the Cluster 2 WP group, who scored within the typical range for female college students.

The results of this second study mirror those of Garner et al.'s earlier findings, and the authors suggest:

> the meaning or motivation behind the anorexic's dieting may be different in essential ways from that of the extreme dieter...it may be speculated that chronic dieters may be motivated more by a desire for physical attractiveness and social approval, the anorexic patient may limit intake to gain a sense of psychological organization. (p. 264)

In their summary, Garner et al. emphasize the importance of a multidimensional evaluation of those individuals suspected of serious eating disorders in order to ascertain true level of risk as well as to develop an appropriate treatment strategy.

Laessle, Tuschl, Waadt, and Pirke (1989)

Laessle, Tuschl, Waadt, and Pirke explicitly tested the hypothesis that bulimia nervosa and restrained eating exist on a simple continuum of psychopathology. Comparisons were made between 20 clinical bulimia nervosa patients, 20 restrained eaters, and 20 unrestrained controls on measures of eating behaviour, weight/shape concerns, and psychopathological features such as depression, anxiety, and low self-esteem. The stated rationale was that if a simple continuum from normalcy to clinical eating disorders exists, then restrained eaters (a group postulated to be at risk for developing bulimia nervosa) should be distinguishable from unrestrained eaters by both eating and weight/shape related symptoms and eating-disorder-related psychopathology. The bulimia group consisted of female patients seeking treatment at a psychiatric clinic who met the criteria for a *DSM-III-R* (APA, 1987) diagnosis of bulimia nervosa upon semistructured interview. The two comparison groups were drawn from a college sample of female students. For these latter participants, degree of dietary restraint was assessed by Factor 1 (cognitive restraint) of the Three Factor Eating Questionnaire (TFEQ; Stunkard & Messik, 1985), with participants scoring in the lower third of the sample distribution being classified as unrestrained eaters, while those scoring in the upper third were classified as restrained eaters. All participants completed the Eating Disorder Inventory (EDI; Garner, 1991), the Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairburn, 1987) and all three factors (cognitive restraint,

disinhibition, and hunger) from the Three Factor Eating Questionnaire (Stunkard & Messick, 1985). The short form of the Beck Depression Inventory (BDI) was also administered in order to assess depressive symptoms.

Pairwise comparisons on the EDI revealed significantly higher means for the bulimic group on each of the eight EDI subscales than both the restrained and the unrestrained eaters. On the Drive for Thinness and Body Dissatisfaction subscales, the restrained eaters scored significantly higher than the unrestrained control group. On the TFEQ subscales reflecting disinhibition and hunger, the three groups differed significantly from each other (unrestrained<restrained<bulimic), but on the hunger subscale, the bulimic group scored significantly higher than the restrained and unrestrained groups, who themselves did not differ. Similar results were found for depression. Concerns regarding shape and weight (as measured by the Body Shape Questionnaire) demonstrated significant incremental increases from the unrestrained to the restrained to the bulimic groups.

A stepwise discriminant function analysis was then performed on the data, which resulted in two functions utilizing 9 of the original 12 variables investigated in the study. These nine variables included the EDI subscales of Drive for Thinness, Bulimia, Interoceptive Awareness, Interpersonal Distrust, and Maturity Fears; Body Shape Concerns as measured by the BSQ); and the Disinhibition and Hunger subscales of the TFEQ. The first function, which accounted for 92% of the between-group variance, separated the bulimics from both the restrained and unrestrained eaters, and the second function separated all three groups almost equally well. The variables most important to group separation on the first function were the EDI subscales of Bulimia, Drive for Thinness, Interoceptive Awareness, and Interpersonal Distrust, as well as Body Shape Concerns (BSQQ) and Disinhibition (TFEQ). The variables showing the highest correlation with the second function included body shape concerns, disinhibition, Drive for Thinness, and hunger.

The authors initially interpreted their results as consistent with the continuum hypothesis of eating disorders, as the pattern of their results derived from pairwise comparisons indicates that restrained eaters differ significantly from unrestrained eaters

in the same direction as bulimic patients. Specifically, they point to the fact that on the EDI's subscales of Drive for Thinness and Body Dissatisfaction, as well as on the BSQ, unrestrained eaters differed significantly from restrained eaters, who in turn, differed from bulimics. Despite these findings, they caution that "confirmation of a continuous dimension among eating disorders is not possible from the present design, because only three points of a potential continuum have been examined, and there may be discontinuities at other points" (p. 774). In addition, contrary to the prediction of the continuity hypothesis, it was found that bulimic patients were clearly distinguishable from both restrained and unrestrained eaters, who themselves did not differ, on several measures including poor Interoceptive Awareness, depression, self-esteem, and fears about social relationships and maturity.

In discussing their results, Laessle, Tuschl, Waadt, and Pirke refer to the findings of Garner, Olmsted, Polivy, and Garfinkle (1984), stating that the two component model of anorexia nervosa suggested by the latter can be generalized and applied to bulimia nervosa. These two components are described as follows:

> One component of psychopathology includes an intense concern with weight, appearance, body shape, and eating, and also (probably because of dieting) the tendency to lose control over eating. These features may well be shared to a greater or lesser extent by "normal" restrained eaters. The second component comprises specific features such as ineffectiveness, distorted interoceptive awareness, and interpersonal distrust, which have been described as fundamental disturbances in eating disorders. (p. 774)

This conceptualization, while in essence proposing something different than discontinuity as it has generally been defined in the debate, has been referred to by subsequent authors as either supportive of discontinuity or alternately, as a kind of a "mixed model," with aspects of continuity as well as discontinuity.

Bunnell, Shenker, Nussbaum, Jacobson, and Cooper (1990)

In a study designed to assess differentiating psychological features among subclinical versus formal eating disorders, Bunnell et al. compared anorexia nervosa patients (n=12), bulimia nervosa patients (n=14), subclinical anorexics (n=21), and

subclinical bulimics (*n*=8) on measures of demographic variables, eating pathology, and general psychological symptoms. The participants were females obtained from a referral pool to an adolescent medicine outpatient clinic, who were classified as to eating disorder status on the basis of a diagnostic, semi-structured interview based on *DSM-III-R* criteria for anorexia and bulimia nervosa. Comparisons between groups on the measures of interest were made using the T statistic. With respect to participants' scores on the Eating Disorder Inventory (EDI), the authors noted that compared with the AN group, subclinical anorexics reported comparable levels of Body Dissatisfaction and Drive for Thinness. Similarly, no differences were found between the anorexics and the subclinical anorexics with respect to their scores on the Ineffectiveness, Perfectionism, Maturity Fears, or Interoceptive Awareness subscales. In addition, the two groups were comparable in their scores on both a measure of depressive symptomatology (BDI) and their scores on both the clinical and the global scales of the SCL-90-R (Derogatis, 1983). The bulimia nervosa group, however, did exhibit significantly higher scores than their subclinical counterparts on the Ineffectiveness subscale of the EDI, as well as on the BDI and several subscales of the SCL-90-R (Obsessive-Compulsive, Depression, Paranoia, and Psychoticism).

The finding that individuals with subclinical anorexia have similar levels of psychological disturbance as those with a diagnosable disorder was interpreted as suggestive that the psychological features of anorexia nervosa are "not simply manifestations of a state of emaciation but, rather, core features of the disorder" (p. 361). In contrast, the differences identified between the bulimics and the subclinical bulimics was held as evidence that relatively strict criteria for the diagnosis of bulimia nervosa be maintained, as the presence of bulimic symptoms may not correspond to significant distress. The authors then hypothesize that it may be the case that the higher levels of psychological distress reported by diagnosable bulimics may arise directly from their disturbed eating habits and/or length of illness, or alternately, may reflect a predisposing factor for the development of the disorder. Future research efforts were suggested to include prospective studies to identify risk factors for the development of an eating disorder.

Steiger, Leung, Puentes-Neuman, and Gottheil (1992)

In order to address the question of whether eating and mood symptoms co-occur in a nonclinical sample, Steiger, Leung, Puentes-Neuman, and Gottheil sampled 1430 school girls ranging in age from 11- to 18-years (median age 14.6 years). They administered questionnaires designed to assess Body Mass Index, body-image concerns, and eating attitudes and behaviours (using the EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), as well as mood, impulsivity, self-criticism, Perfectionism, and family incohesion. Using grouping criteria of a cut-off score of 20 on the EAT-26 and scores on the mood measure (greater than 1 SD above the sample mean as a cut-off for mood problems), and after eliminating obese individuals, the following groups were formed: Eating and mood disturbed (EMD; *N*=62), eating disturbed only (ED; *N*=34), mood disturbed only (MD; *N*=68), and asymptomatic (ASYM; *N*=342). One-way multivariate analysis of variance revealed group differences on body-image concerns, Perfectionism, impulsivity, self-criticism, and family incohesion. Subsequent univariate ANOVAs and group contrasts revealed that the eating disorder (ED) group resembled the eating and mood disordered (EMD) group on body-image concerns and Perfectionism. However, the ED group reported less self-criticism, impulsivity, and family incohesion than the EDM group. Contrasts between the EMD and the MD groups revealed no significant differences on most measures, however body image concerns in MD individuals were lesser.

A canonical correlation analysis was also performed on the data, resulting in two significant variates. The first pair had a canonical correlation of .88 ($r2$=.43) and indicated that concurrent eating and mood symptoms were related to body-image concerns, impulsivity, self-criticism, and family incohesion, and appeared to reflect the congruence of eating and mood symptoms. The second pair of variates ($r2$=.19) were indicative of eating symptoms in the absence of other disturbances apart from body-image concerns. The most compelling finding of the study was the finding that eating and mood disturbances co-occur even at subclinical levels, and the co-occurrence of eating and mood disturbances is associated with a greater severity of psychological and family difficulties than when eating disturbances occur alone. As such, participants

reporting only eating problems showed a more intact profile, bearing few resemblances to clinical eating disorder patients.

In discussing their findings, the authors state that the pattern of results mirrors what would be expected if the *two component* model suggested by Garner, Olmsted, Polivy, and Garfinkle (1984) holds true. They note the importance of finding that three distinct groups exist: (a) a group with body-image concerns but not general psychopathology, (b) a group with mood but not body-image problems, and (c) a group exhibiting both body-image concerns and psychopathology, and suggest that clinical cases of eating disorders develop only when body-image concerns co-exist with psychopathology.

Lindeman, Stark, and Keskivaara (2001)

In their review of the continuity versus discontinuity debate, Lindeman, Stark, and Keskivaara argue that continuity can only be said to be descriptive of one variable, and as a relationship between more than one variable (i.e., eating disorder symptoms and psychological vulnerability) cannot be described using concepts such as continuity or discontinuity. They propose instead that the most appropriate means of conceptualizing the question is as a question of linearity. As the authors state, "the main attribute characterizing the nature of a relationship between two variables is linearity" (p. 182). Therefore, they propose that that there follows three potential hypotheses: (a) linearity, such that "predisposing factors (e.g., maturational fears and Perfectionism) increase smoothly and constantly as the signs of eating disorders increase," (b) non-linearity, which would predict that "individuals with severe signs of eating disorders have pathological characteristics that are not found among other individuals," and (c) the "linearity/nonlinearity hypothesis...which posits that psychopathological disturbances may increase with eating disorder symptoms, but the most severely disordered individuals differ more strikingly from others than the latter differ from each other" (p. 182). While it would be difficult to conceive that there are psychopathological characteristics exclusive to anorexics and bulimics that do not exist in the rest of the population (hypothesis 2), results consistent with linearity (hypothesis 1) would be in keeping with the continuity perspective, while those consistent with the

linearity/nonlinearity hypothesis (hypothesis 3) would be consistent with the views of Bruch, Crisp, and Selvini-Palazzoli.

Two hundred and sixty five female participants were attained through recruitment through undergraduate-level introductory psychology courses. An additional 14 females seen in a hospital psychiatric clinic and diagnosed with anorexia nervosa were included in the analyses. Eating disorder symptoms were assessed using the short form of the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979), and the EDI-2 (Garner et al., 1983) was administered to assess the pathological characteristics that theorists have historically considered to be important predisposing factors to eating disorders. The data were then subjected to curve analysis with the "precipitating psychological factors" as the dependent variables and the "entity of eating disorder symptoms" (p. 184) as the independent variable. The authors report that while all of the psychopathological traits (Drive for Thinness, Bulimia, Body Dissatisfaction, Interoceptive Awareness, Perfectionism, Ineffectiveness, Interpersonal Distrust, and Maturity Fears) showed significant linear trends ($p<0.01$), they each also had significant quadratic trends ($p<0.01$). A second analysis was then conducted in which the participants were divided into six groups on the basis of their total EAT scores: none ($n=27$), very mild ($n=97$), mild ($n=70$), intermediate ($n=42$), borderline ($n=10$), and a severe group evidencing EAT scores greater than 30 or a diagnosis of anorexia nervosa ($n=19$). For all of the EDI-2 subscales assessed, the subscale scores increase (though it would appear significance testing was not performed) as the groups move from those with no or few eating disorder symptoms to those whose EAT scores progressively increase.

Of the three hypotheses tested, the authors report that the one which received unanimous support was the linearity/non-linearity hypothesis, as neither linearity nor non-linearity alone accounted for the relationship between the psychopathological traits and the eating disorder symptoms assessed. In discussing their results, the authors suggest that it may be counter-productive to conceive of linearity and non-linearity as mutually exclusive, and that perhaps the etiological models of both Nylander and Bruch can be combined into a "synergistic whole" (p. 186).

Summary of Previous Research on the Continuity/Discontinuity of Eating Disorders

With respect to eating disordered behaviour, there is much research to support the view that many of the key diagnostic features of anorexia and bulimia appear to fall along a continuum of severity in the population. For example, both binge eating and dietary restraint were found to increase significantly from normal controls to binge eaters to bulimics (Katzman & Wolchik, 1984).

Body image and weight preoccupation have been suggested by many to constitute a continuous variable, with incremental increases reported as one's eating behaviour becomes more disordered. Individuals who met the *DSM-III-R* criteria for bulimia nervosa were found to be significantly more weight preoccupied than those who met the criteria for subthreshold bulimia, and both bingers and purgers exhibited greater levels of weight preoccupation that either normal controls or chronic dieters (Mintz & Betz, 1988). Similar incremental increases have also been found for body dissatisfaction (Mintz & Betz, 1988), depression (Dancyger & Garfinkel, 1995), dietary restraint (Stice, Ziemba, Margolis, & Flick, 1996), as well as thinking about appearance, obsessing about food, feeling fat, and fear of becoming fat (Mintz & Betz, 1988). However, Katzman and Wolchik (1984) identified that while bulimics exhibited a greater degree of negative body attitudes than controls, bulimics and binge eaters did not differ significantly, a finding that is not consistent with continuity with respect to this variable. In addition, both Stice et al. (1996) and Rossiter, Wilson, and Goldstein (1989) reported that bulimics and their subthreshold groups did not differ on levels of body dissatisfaction, with each scoring more highly than controls. Self-appraisal has also been described as a continuously distributed variable, as several studies (Mintz & Betz, 1988; Katzman & Wolchik, 1984) have found self-esteem to decline incrementally with increases in degree of eating disturbance. Physical self-esteem or self-concept, in particular, has been found to be an important discriminator of individuals with bulimia, repeat dieters, and normal eaters (Dykens & Gerrard, 1996).

In contrast, several studies have found results inconsistent with the continuity hypothesis in that the control group differed significantly on variables of interest from the both the subclinical and the clinical groups , who did not differ from each other. This result was found for variables such as perfectionism (Stice, Killen, Hayward, & Barr Taylor, 1998; Thompson et al., 1987), body dissatisfaction (Stice et al., 1998; Dancyger & Garfinkel, 1995; Thompson et al., 1987; Bunnell et al., 1990), feelings of ineffectiveness (Bunnell et al., 1990), depression (Stice et al., 1998), maturity fears (Bunnell et al., 1990), and interoceptive awareness (Bunnell et al., 1990). In addition, there are many reports of findings (e.g., Tykla & Subich, 1999; Rossiter, Wilson, & Goldstein, 1989) which indicate that the clinical group (usually bulimics) differ significantly from the subthreshold and the control groups, whom themselves do not differ, on key variables.

Finally, there are those studies whose results are mixed, with some aspects of their findings consistent with the continuity model while other findings more consistent with discontinuity (e.g., Lindeman, Stark, & Keskivaara, 2001; Bunnell et al., 1990). For example, several studies identified subgroups of subclinical individuals who differ qualitatively from other subclinical individuals in that they possess not only the attitudinal and behavioural features of anorexia or bulimia to a similar or reduced degree as clinical participants, but also possess the psychological characteristics thought to be central to eating disorders (Garner et al., 1983; Garner et al., 1984; Thompson & Schwartz, 1982). Other research has found that different sets of variables are necessary to separate the non-eating disordered control group from the subclinical group, and the subclinical group from the eating disordered group (Ruderman & Grace, 1988; Laessle et al., 1989). In contrast, other researchers have reported that their groups differ along only one discriminant function (Stice et al., 1996; Stice et al., 1998; Vanderheyden & Boland, 1987), which would be inconsistent with a model of discontinuity.

The various methods of analyses in the studies summarized in the previous section, as well as the author's (or subsequent authors') interpretation of results in terms of the continuity/discontinuity models are presented in Table 1.

Stice, Ziemba, et al. (1996) noted two factors which may account for some of the variability in results across studies investigating the continuity/discontinuity hypotheses. First, those studies that contrasted groups on variables that are theoretically related to eating pathology (e.g., body dissatisfaction and restraint) primarily supported the continuity hypothesis, whereas studies that contrasted the groups on general psychological symptoms (e.g., maladjustment, psychoticism) primarily supported the discontinuity perspective. The authors cite the importance of taking into consideration "the distinction that has been made between etiologic variables that are related to the core eating pathology versus those that are related to common comorbid conditions found with eating disorders" (Crowther & Mizes, 1992, cited in Stice, Ziemba, et al., 1996, p. 535). In addition, they note that in general, the cell sizes were larger in the studies supporting the continuity perspective (average n=61) than in those supporting the discontinuity perspective (average n=22), allotting them greater statistical power.

Table 1. ***Summary of Statistical Methods and Interpretations with Respect to Continuity/Discontinuity in Previous Studies***

Study	Analyses	Authors' (or subsequent authors') Interpretation of Results
Mintz & Betz, 1988	ANOVA, post-hoc comparisons.	Supportive of continuity.
Prather & Williamson, 1988	Chi-square analysis.	Supportive of continuity.
Stice et al., 1996	ANOVA, pairwise comparisons, discriminant function analysis.	Supportive of continuity.
Stice et al., 1998	Discriminant function analysis, univariate pairwise contrasts.	Supportive of continuity.
Thompson, Berg, & Shatford, 1987	ANOVA, posthoc comparisons using the Sheffe procedure.	Supportive of continuity.
Vanderheyden & Boland, 1987	Discriminant function analysis, ANOVA, posthoc comparisons.	Supportive of continuity.
Rossiter, Wilson & Goldstein, 1989	MANOVA, univariate *F* tests.	Supportive of continuity.
Dancyger & Garfinkel, 1995	MANOVA, ANOVA, Tukey contrast tests.	Supportive of continuity.
Lowe et al., 1996	Principal components analysis, trend analyses, regression analyses.	Supportive of continuity.
Tylka & Subich, 1999	Study 1: MANOVA, post hoc comparisons (Sheffe), trend analysis.	Supportive of continuity.
	Study 2: MANCOVA, post hoc comparisons (Scheffe), trend analysis.	Supportive of continuity.

Study	Analyses	Authors' (or subsequent authors') Interpretation of Results
Franko & Omori, 1999	ANCOVA, Tukey contrast tests.	Supportive of continuity
Fitzgibbon et al., 2003	Discriminant function analysis, MANCOVA, post hoc comparisons (Student-Newman-Keuls range tests).	Supportive of continuity.
Thompson & Schwartz, 1982	MANOVA, post hoc comparisons.	Not supportive of continuity.
Katzman & Wolchik, 1984	MANOVA, post hoc comparisons (Newman-Keuls procedure).	Not supportive of continuity.
Ruderman & Grace, 1988	Stepwise regression analyses.	Not supportive of continuity.
Steiger, Leung, Ross, & Gulko, 1992	ANOVA, post hoc comparisons (Scheffe).	Not supportive of continuity.
Dykens & Gerrard, 1986	Study 1: MANOVA, ANOVA, stepwise discriminant function analysis.	Mixed results.
	Study 2: MANOVA, discriminant function analysis.	Mixed results.
Ruderman & Besbeas, 1992	Study 1: ANOVA, post hoc comparisons (Neuman-Keuls procedure), discriminant function analysis, stepwise regression analysis.	Mixed results.
	Study 2: Principle components anaylsis.	
Drewnowski et al., 1994	Chi-square analysis (McNemar).	Mixed results.
Mintz et al., 1997	Study 1: ANOVA, post hoc contrasts.	Supportive of continuity.
	Study 2: ANOVA, post hoc contrasts.	Not supportive of continuity.
Garner et al., 1983	Chi-square analysis, cluster analysis.	Mixed results.
Garner et al., 1984	ANOVA, planned *t* tests, stepwise discriminant function analysis, cluster analysis.	Mixed results.
Laessle et al., 1989	ANOVA, planned t-tests, stepwise discriminant function analysis, cluster analysis.	Mixed results.
Bunnell et al., 1990	*T* tests.	Mixed results.
Steiger, Leung, Puentes-Neuman, & Gottheil, 1992.	Canonical correlation analysis, ANOVA, group contrasts.	Mixed results.
Lindeman, Stark, & Keskivaara, 2001	Curve analysis.	Mixed results.

Note. Studies are listed in the order they are presented in this thesis.

One of the more serious limitations of past research into the continuity/discontinuity debate has to do with the operationalization of eating disorder symptoms and the classification rules for selecting participant groups. The methods for assessing eating disorder status have varied widely as illustrated in Table 2. Some studies have cut-off scores on self-report measures of eating disorder symptoms (e.g., Drive for Thinness scale of EDI) as indicators of their eating disorder status whereas

others have utilized *DSM* criteria through either self-report questionnaires or structured clinical interviews to assess eating disorder status.

Table 2. Methods of Classifying Participants in Previous Studies

Study	Group Classifications	Basis for Classification
Mintz & Betz, 1988	Bulimics (*n*=20), subthreshold bulimics (*n*=173), bingers (*n*=100), purgers (*n*=66), chronic dieters (*n*=73), normals (*n*=211).	*DSM-III-R* criteria (questionnaire).
Prather & Williamson, 1988	Bulimic binge-purgers (*n*=16), bulimic binge-eaters (*n*=16), obese in treatment (*n*=16), obese control (*n*=16) , nonobese control (*n*=16).	*DSM-III* criteria (questionnaire).
Stice et al., 1996	Putative bulimic (*n*=18), subclinical bulimics (*n*=46), controls (*n*=61).	BULIT-R (Thelen et al., 1991).
Stice et al., 1998	Bulimic (*n*=19), subthreshold bulimics (*n*=141), controls (*n*=660).	*DSM-III-R* criteria (structured interview).
Thompson, Berg, & Shatford, 1987	Bulimic (=19), bulimic-like (*n*=41), symptom-free (*n*=35).	*DSM-III-R* criteria (questionnaire).
Vanderheyden & Boland, 1987	normals (*n*=73), mild binge eaters (*n*=23), moderate binge eaters (*n*=23), severe binge eaters (*n*=14), binge vomiters (*n*=18).	Self-report indices, binge scale (Hawkins & Clement, 1984)
Rossiter, Wilson & Goldstein, 1989	Bulimia nervosa (*n*=10), restrained eaters and unrestrained eaters (combined *n*=20).	Diagnostic criteria for bulimia (Fairburn, 1985), Dietfac (Lowe, 1984), current weight.
Dancyger & Garfinkel, 1995	Full scale eating disorder patients (*n*=30), partial syndrome eating disorders (*n*=51), normal controls (*n*=57).	EAT (Garner & Garfinkel, 1979), *DSM-III-R* criteria (interview).
Lowe et al., 1996	Bulimics (*n*=21), current dieters (*n*=15), restrained nondieters (*n*=14), unrestrained nondieters (*n*=23).	*DSM-III-R* criteria (interview), Restraint Scale (Herman & Polivy, 1980), self-report of current dieting status.
Tylka & Subich, 1999	Study 1: asymptomatic (*n*=57), symptomatic (*n*=76), eating disordered (*n*=36).	*DSM-III-R* criteria (questionnaire).
	Study 2: asymptomatic (*n*=31), symptomatic (*n*=69), eating disordered (*n*=35).	*DSM-III-R* criteria (questionnaire).
Franko & Omori, 1999	Non dieters (*n*=105), casual dieters (*n*=35), intensive dieters (*n*=48), dieters at risk (*n*=14), probable bulimics (*n*=14).	*DSM-III-R* criteria (questionnaire).
Fitzgibbon et al., 2003	Obese nonbinger (*n*=59), subthreshold BED (*n*-59), BED (*n*=64), subthreshold bulimic (*n*=105), bulimia nervosa (*n*=123).	*DSM-IV* criteria (questionnaire).
Thompson & Schwartz, 1982	Anorexia nervosa (*n*=26), normal weight "anorexia-like" (*n*=25), symptom-free (*n*=25).	Feighner (1972) criteria, EAT (Garner & Garfinkel, 1979), current weight.
Katzman & Wolchik, 1984	Bulimics (*n*=30), binge-eaters (*n*=22), normal controls (*n*=28).	*DSM-III* criteria (questionnaire), screening questions, weight.

Study	Group Classifications	Basis for Classification
Ruderman & Grace, 1988	Participants not classified.	*n*/a
Steiger et al., 1992	Eating and mood disturbed (*n*=31), eating disturbed only (*n*=54), low eat/mood (*n*=75).	EAT-26 (Garner et al., 1982), Depression subscale of SCL-90-R (Derogatis, 1977).
Dykens & Gerrard, 1986	Study 1: Bulimics (*n*=29), repeat dieters (*n*=254), nondieters (*n*=110).	*DSM-III* criteria on interview (bulimics), questions about dieting habits and practices (dieters, nondieters).
	Study 2: Current bulimics (*n*=27), historic bulimics (*n*=12), repeat dieters (*n*=31), nondieters (*n*=52).	*DSM-III* criteria on interview (bulimics), questions about dieting habits and practices (dieters, nondieters).
Ruderman & Besbeas, 1992	Study 1: Bulimics (*n*=19), dieters (*n*=21), nondieting controls (*n*-33).	BULIT (Smith & Thelen, 1984), Restraint Scale (Herman et al., 1978).
	Study 2: Participants not classified.	
Drewnowski et al., 1994	Probable bulimics (*n*=19), dieters at risk (*n*=55), intensive dieters (*n*=162), casual dieters (*n*=245), nondieters (*n*=76).	*DSM-III-R* criteria (questionnaire).
Mintz et al., 1997	Study 1: Eating disordered (*n*=33), symptomatic (*n*=20), asymptomatic (83).	*DSM-IV* Criteria (questionnaire).
	Study 2: Eating disordered (*n*=11), symptomatic (*n*=46), asymptomatic (110).	*DSM-IV* Criteria (questionnaire).
Garner et al., 1983	Anorexic (*n*=49), weight preoccupied (*n*=38), non weight preoccupied (*n*=137).	Modified Feighner et al. (1972) criteria for AN patients.
		EDI (Garner, 1991) Drive for Thinness subscale for non-anorexics.
Garner et al., 1984	Anorexic (*n*=50), weight preoccupied (*n*=35), non weight preoccupied (*n*=134).	Modified Feighner et al. (1972) criteria for AN patients.
		EDI Drive for Thinness subscale for non-anorexics.
Laessle et al., 1989	Bulimics (*n*=20), restrained eaters (*n*=20), unrestrained controls (*n*=20).	*DSM-III-R* criteria (interview) for bulimics, TFEQ (Stunkard & Messik, 1985) for restrained/unrestrained groups.
Bunnell et al., 1990	Anorexia nervosa (*n*=12), bulimia nervosa (*n*=14), subclinical anorexics (*n*=21), subclinical bulimics (*n*=8).	*DSM-III-R* Criteria (interview).
Steiger, Leung, Puentes-Neuman, & Gottheil, 1992	Eating and mood disturbed (*n*=62), eating disturbed only (*n*=34), mood disturbed only (*n*=68), asymptomatic (*n*=342).	EAT-26 (Garner et al., 1982), scores on a mood measure.
Lindeman, Stark, & Keskivaara, 2001	Level of eating disordered symptoms: none (*n*=27), very mild (*n*=97), mild (*n*=70), intermediate (*n*=42), borderline (*n*=10), severe and/or anorexia diagnosis (*n*=19).	EAT (Garner & Garfinkel, 1979) scores.

Note. Studies are listed in the order they are presented in this thesis.

A further difficulty arises in that methods for classifying participants into group once their eating disorder symptoms have been assessed have also varied across studies. In some studies, participants have been classified according to the presence and severity of only one variable associated with eating disorders (e.g., binge eating), while others have required their subclinical group to evidence more than one eating disorder symptom (e.g., binge eating, purging, and over-concern with body shape and weight). As a result, the defined clinical, subclinical, and control groups are nearly impossible to compare from study to study. For example, Laessle et al. (1989) divided their groups into bulimics, restrained eaters, and unrestrained controls, whereas Katzman and Wolchik (1984) utilized bulimic, binge-eating, and non-binge-eating controls. Within some studies, even the defined clinical groups are questionable with respect to how well they represent anorexia or bulimia nervosa. Franko and Omori's study (1999), for example, had no clinical cases represented, whereas Fitzgibbon, Sanchez-Johnse, and Martinovich (2003)'s sample consisted solely of treatment-seeking individuals. Further, Thompson et al.'s (1987) bulimic group appears to be more subclinical than clinical, in that participants in this group were only required to report binging from five to six times per month, and using vomiting or laxatives *only once*. Clearly, if the clinical group does not in fact represent a true clinical group, then comparisons among groups for the purposes of analyzing the continuity/discontinuity debate are meaningless. The importance of an appropriate measure of eating disorder status is underscored by the finding of Hesse-Biber (1992), who noted that in her study of eating disorder symptoms among college women, women who reported evidence of serious eating disorder symptoms (e.g., vomiting) scored as *normals* on a discontinuous measure (the EAT-26; Garner et al., 1982).

Tylka and Subich (1999) suggested that in order to remedy the problem of defining cases, researchers should adopt the eating disorder classification method developed by Mintz et al, (1997), through utilizing the Questionnaire for Eating Disorder Diagnoses (Q-EDD). They assert that it is the most appropriate method for classifying varying levels of eating disorder status, as it is based on the *DSM-IV* criteria, and provides a means of classification for eating disorders not otherwise specified (EDNOS). However, in utilizing this classification method in their own study, Tylka and Subich's

(1999) eating disordered group included a heterogeneous group of individuals who met the *DSM-III-R* criteria for either anorexia nervosa, bulimia nervosa, or an eating disorder not otherwise specified. The inclusion of EDNOS participants in this category may be tantamount to treating subclinical (EDNOS) individuals as clinical ones, and creating an artificial group of subclinical participants.

Even if it were the case that similar classification rules were used across studies, a further problem arises in that while some studies included clinical anorexics or bulimics in their eating disordered group, others selected their eating disordered group from a university sample. As Pyle et al. (1983) noted, university samples often differ from those presenting clinically, primarily with respect to the use of purgation techniques. In addition, anorexics and bulimics presenting for treatment may differ psychologically in important ways from those not presenting for treatment. The inclusion of clinical eating disordered individuals in research investigating the continuity/discontinuity debate is imperative, as one must allow for the full severity of psychopathological symptoms associated with anorexia and bulimia nervosa to enter into the analyses in order to properly assess if there is a discontinuity between the subclinical and clinical groups. A related limitation of many of the previous studies on the topic involves the theoretically, rather than naturally driven selection of participants, which results in the exclusion of all those who do not fit the narrowly defined classification criteria. In the majority of previous studies, those individuals who did not fit easily into one of the preconceived groups were simply excluded from the eating disorder *continuum*. However, the very concept of a continuum as a means of expressing the natural ordering of a characteristic across a population implies, if not necessitates, that all individuals have a place within this continuum. Therefore, if there truly is an eating disorder continuum, ranging from absent to most severe, it seems most appropriate to allow for a representation of the full extent of this continuum in the analyses. Failure to do so not only disallows the comparison of results across studies, but may in fact obscure the true nature of the relationship in question.

An additional difficulty arises when the participants are ordered on the basis of only one or two variables related to eating disorders. One might argue that studies

utilizing this practice are in fact testing the continuity/discontinuity of a *variable* associated with eating disorders, rather than testing whether or not *eating disorders* are continuous or discontinuous entities. For example, Laessle et al. (1994) grouped their participants on the basis of degree of restraint, with the continuum of participant groups progressing from bulimics, to current dieters, to restrained nondieters, and finally to unrestrained nondieters. These studies, in the interest of creating homogenous groups, choose to exclude many potential participants who possess other features of eating disorders (e.g., binge eating). However, when the continuum of participant groups are obtained by simply ordering the participants on the severity of a *variable* (e.g., degree of binging behaviour or degree of restraint), as was the case in many of the previous studies investigating the continuity/discontinuity hypotheses, this does not address the question of true clinical interest, which is whether some *individuals* are predisposed to the development of a clinical eating disorder by virtue of the presence of certain predisposing psychological traits. This question cannot be answered in a valid manner unless one looks in an inclusive manner at *people* and how the presentation of the symptoms in question (which relate to eating disorder diagnoses) exist naturally in the real world. The present study attempts to account for the representation of all eating disordered symptoms related to the *DSM*-classification of anorexia and bulimia nervosa in the continuum of severity, rather than artificially isolating one or two variables.

A further limitation of much of the previous research on the participant relates directly to the phrasing of the question. While much debate has occurred relating to the continuity versus the discontinuity of eating disorders, continuity as a mathematical concept can only be understood as continuity with respect to an individual variable. As such, the question of continuity versus discontinuity is perhaps not the appropriate way to phrase the question. It is more accurate and appropriate to consider the question as one of categorical discreteness. That is, if anorexia and bulimia represent qualitatively different entities from below threshold eating disturbances, what we should find is that different information is required to *explain* or describe the clinical group than is necessary to describe the non-clinical groups.

A guiding force of the present study was the desire to investigate the question of eating disorder discreteness in a manner, which would be not only theoretically sound, but clinically meaningful. The pervasive practice of creating narrowly defined classifications in research, excluding many from the analysis, creates obvious limitations with respect to external validity. This is particularly problematic in that the results, however well defined, are applicable to only a small subset of the population, which places strict limits on the clinical utility of any information gleaned. The inclusive nature of categorizing individuals in the present study has the potential for broader applicability of results, even if at the expense of homogeneity of groups.

A further advantage to the inclusive classification method chosen for the present study relates to the importance of assessing the potential continuum of anorexia nervosa. As Scarano and Kalodner-Martin (1994) noted, anorexia nervosa has "not been discussed in terms of this continuum of eating disorders" (p. 356) apart from a handful of studies that included anorexics in their analyses. These authors suggest that "it is possible that a different continuum exists from normal eating to anorexia that may overlap with the normal eating to bulimia continuum, yet this is an empirical question that is not yet answered" (p. 356), which is perceived as plausible given that "there is considerable overlap between bulimia and anorexia; for example, bulimic symptoms do develop in a subgroup of individuals with anorexia nervosa" (p. 356). Consistent with the central aim of providing a true, naturalistic continuum of eating disordered symptomatology, the present study includes those participants who exhibit anorexia-like behaviour as well as those with anorexia nervosa diagnoses.

In summary, the present study seeks to address some of the limitations of previous research on the continuity/discontinuity hypotheses of eating disorders through allowing for the inclusion of anorexics and anorexia-like individuals, the inclusion of both non-clinical individuals and clinical eating disorder patients, and a naturalistic representation of the range of eating pathology as it exists in the population. In addition, the question of interest addressed by the analyses will be rephrased as follows: Can eating disorders be explained by the same variables that account for below threshold levels of eating disturbances, or is additional, and different, information required?

Statement of the Research Hypotheses

Research Hypothesis I

The discriminant space will require two discriminant functions to adequately account for differences in eating disorder symptomatology as measured by the Eating Disorder Inventory-2 as the frequency and/or intensity of eating disordered attitudes and behaviours increase.

Research Hypothesis II

The first discriminant function will best be described as an index directly related to disordered eating, whereas the second discriminant function will be characterized as representative of the psychopathology associated with anorexia and bulimia nervosa.

METHOD

Participants

Participants for the study included both a non-clinical sample of secondary school students and a clinical sample of eating disordered participants.

Non-Clinical Participants

The non-clinical sample was obtained from both public and private British Columbia Lower Mainland secondary schools. The public schools participating in the study included Burnett, Richmond, and Westview secondary schools, and a total of 387 females aged 13- to 18-years-old participated in the study. As earlier research has suggested a socioeconomic bias in these disorders such that the prevalence rate may be higher among the upper classes, participants (n=247) were also obtained from a Vancouver private school for girls, Crofton House. As a result of the length of time required by some participants to complete the questionnaire package, as well as the time constraints posed by scheduled class times, a second class period was provided for participants to complete the research package. Due to student absences at the second testing period, and the decision made by some teachers not to provide a second class period for the students to complete the entire testing package, the data for many of the participants was incomplete and could not be utilized for the purposes of this study. In total, 270 of the public schoolgirls and 242 of the private schoolgirls provided complete data packages, and these students (n=512), constitute the non-clinical sample of this study.

Following approval from the Richmond and Maple Ridge School Boards (for those students in the public school sample), the principals of each of the aforementioned schools provided their permission for their students to participate in the study. Prior to the study, each potential participant was given a consent form (Appendix A) and

information sheet (Appendix B) to take home to her parents or legal guardians. These forms outlined the nature and purpose of the study, provided the names of persons to contact should they have any questions or concerns, and informed them they may contact the principal researcher to obtain a copy of the results of the study upon its completion. At the request of all participating schools, the parental consent form required only passive consent such that only those parents who did not wish their child to participate in the study were required to return the completed form.

Clinical Participants

As the central aim of the present study was to compare the non-clinical and eating disordered participants on eating disorder symptoms, behaviours, and psychopathology, a large clinical sample of females diagnosed with anorexia or bulimia nervosa was required. However, given that this is a difficult population to access in research, and in order to achieve the numbers of clinical participants required for the planned analyses, participants were attained from four different eating disorder treatment centres across Western Canada: (a) The University of Alberta Hospital's Eating Disorder Unit, (b) Westwind Eating Disorder Recovery Centre, (c) The Calgary Counselling Centre's Eating Disorder Program, and (d) British Columbia Children's Hospital's Eating Disorder Unit. In total, 109 participants were attained from a clinical setting.

Approval to conduct research within the hospitals was obtained from the British Columbia Children's Hospital's Research Review Committee as well as from the University of Alberta Hospitals Research Ethics Board. Consent to conduct research for the non-hospital based programs (Calgary Counselling Centre and Westwind Eating Disorder Recovery Centre) were obtained from the directors of these private clinics themselves. The data collected from the University of Alberta's Eating Disorder Unit and from the Westwind Eating Disorder Recovery Centre was the result of *live* data collection. Staff who normally conduct intake at these programs informed new admissions/clients (both inpatient and outpatient) of the opportunity to participate in the study. Following the attainment of participant (Appendix C) and parent/guardian consent

(Appendix D), an assigned program staff member administered the test protocol individually to each new participant, following the same script that was given by the teachers administering the test protocols at the secondary school sites. Completed questionnaire packages were obtained for six patients each from the University of Alberta's Eating Disorder Unit and the Westwind Eating Disorder Recovery Centre, and all were retained for the present analyses.

As it was extremely difficult to obtain a sufficient sample size of eating disordered patients using live data collection methods, it was decided to expand the eating disordered participant sample by utilizing archival data on eating disorder patients. Data was obtained from a patient sample in this manner by collecting from two sites; the Calgary Counselling Centre (outpatient sample) and the British Columbia Children's Hospital Eating Disorder Unit (predominantly inpatient sample). Both of these centres include, upon admission, a consent form that when signed by the patient, signifies their consent for the information obtained from them upon intake, as well as any test scores, be utilized for the purposes of future research. Only the patients who indicated this form of consent were included as participants in this study. As the file notes of former patients at both of these sites included detailed information on the eating disordered behaviour exhibited by the patients at the time of admission, as well as their *DSM-IV* diagnostic classification, it was possible to group these participants into the grouping classification system of the present analysis. As such, the responses of these participants on the Health Information Questionnaire (HIQ; described in Geller, Johnson, & Madsen, 1997), which served as the method for classification of participants in terms of their eating disorder status in this study, were not required. For each of these patients, a completed Eating Disorder Inventory-2 (the measure of interest in this study) was completed at the time of intake, near or at the same time as their *DSM-IV* eating disorder diagnosis was ascertained and recorded.

Instruments

Unpublished Instruments

Subject Information Sheet

The subject information sheet (Appendix E) was prepared by the author for the purposes of this study. This sheet contains questions concerning basic demographic variables, such as age, sex, height, current weight, ethnicity, and parental education and occupation. In addition, information was gathered concerning ideal weight, current exercise habits, and the students' understanding of the terms anorexia nervosa and bulimia.

Health Information Questionnaire

The Health Information Questionnaire (HIQ) is self-report instrument designed by Geller, Johnston, and Madsen (described in Geller, Johnston, & Madsen, 1997) to assess the presence and severity of disturbed eating. Based on *DSM-IV* (APA, 1994) criteria for *anorexia nervosa*, *bulimia*, and *eating disorder not otherwise specified*, the HIQ includes questions pertaining to weight status (including BMI) and history, menstrual history, fear of weight gain, dieting, fasting, binge eating, lack of control over eating, a range of purgative behaviours, and the influence of shape and weight on self-esteem. Body Mass Index (BMI=Kg/M2) is assessed by the individual's report of height and current weight, and is necessary for the determination of an anorexia nervosa diagnosis. Accuracy of self-reported weight and height has been demonstrated in previous studies of adolescents (e.g., Whitaker, 1989), and self-reported weight has been reported to be highly correlated with measured weight above 0.90 (Attie & Brooks-Gunn, 1989; Smith, Hohlstein, & Atlas, 1992).

The HIQ provides a total "disturbed eating score," which may range from 0 to 69, and allows for a DSM-IV eating disorder diagnosis (and therefore DSM-IV-TR (APA, 2000) eating disorder diagnosis, given that the revisions in the current version are revisions in text only, with no changes made to diagnositic criterion).

Published Instruments

Eating Disorder Inventory-2

The Eating Disorder Inventory-2 (EDI-2) of Garner (1991) is a self-report inventory which assesses the cognitive and behavioural features of both anorexia and bulimia nervosa. This instrument is not intended for the purposes of making formal diagnoses, but instead is "aimed at the delineation and precise measurement of certain psychological traits or symptom clusters presumed to have relevance in the understanding and treatment of eating disorders" (p. 1). The EDI-2 consists of eight subscales, including: (a) Drive for Thinness, (b) Bulimia, (c) Body Dissatisfaction, (d) Ineffectiveness, (e) Perfectionism, (f) Interpersonal Distrust, (g) Interoceptive Awareness, and (h) Maturity Fears. There are also provisional subscales of Asceticism, Impulse Regulation, and Social Insecurity. However, due to the relative paucity of reliability and validity data on these provisional subscales, as well as questions as to its factorial integrity (e.g., Eberenz & Gleaves, 1994), only the original eight scales were utilized for the purposes of the present analysis. The EDI-2 consists of 91 statement items (64 of which comprise the 8 original subscales) to which the individual is required to respond by indicating the frequency at which the statement is true for them, either always, usually, often, sometimes, rarely, or never. Descriptions of each of the eight main subscales are provided for further illustration:

1. *Drive for Thinness*: this subscale measures the need to strive for a thin body type, or the fear of fatness which is central to both anorexia and bulimia nervosa.
2. *Bulimia*: assesses the tendency to think about or to engage in binging, or episodes in which eating is experienced as being out of control.
3. *Body Dissatisfaction*: measures dissatisfaction with one's body, particularly those body parts which are of greatest concern to eating disorder patients.
4. *Ineffectiveness*: assesses feelings of inadequacy and worthlessness, as well as feelings of being empty and alone.
5. *Perfectionism*: measures the degree to which the individual strives towards high levels of achievement.

6. *Interpersonal Distrust*: this subscale taps the extent to which one feels alienated from others and avoids close personal relationships or emotional openness with others.
7. *Interoceptive Awareness*: measures uncertainty and confusion in identifying affective and bodily states.
8. *Maturity Fears*: assesses the desire to return to the safety of childhood and the fears associated with becoming an adult.

Raw scores on each test item are transformed as follows: items endorsed in the most symptomatic direction (either always or never) are scored as 3, with immediately adjacent responses (either usually or rarely) receiving a score of 2, and the next adjacent response (either often or sometimes) scoring as a 1. The three response alternatives falling farthest from the symptomatic direction are all coded as 0. This procedure of transforming scores from a 6-point to a 4-point scale is recommended by the author with the argument that "responses in the nonsymptomatic direction should not aggregate to contribute to a total subscale score reflecting psychopathology" (p. 7). In illustrating this point, Garner provides the example that if the 1-6 scoring of the raw scores were maintained, the score of an individual who endorsed two responses in the *asymptomatic* direction (e.g., 3 + 3=6) would be weighted as highly as the score of an individual with one extreme response in the *symptomatic* direction. The concern, then, is that utilizing raw scores could inflate the estimate of the pathology of nonsymptomatic individuals, or normals.

The EDI-2 test items were chosen empirically, based upon their ability to differentiate between criterion groups of eating disorder patients and non-clinical samples. The factorial integrity of the original 64-item EDI has been well supported in validation studies of clinical populations, however in more recent studies of nonpatients, its factorial integrity, internal consistency, and concurrent validity have been found to be insufficient (van Strien & Ouwens, 2003; Schoemaker, van Strien, & Van der Staak, 1994). Despite these findings, the EDI and the EDI-2 continue to be widely used in research involving nonpatient samples, primarily due to its representation of a broad range of variables, both behavioural and psychological, believed to be central to both anorexia and bulimia nervosa.

The recommended practice of transforming raw scores has also fallen under scrutiny, being criticized by many as being insensitive to the varying levels of the trait being measured. While it may be preferable in terms of diagnostic specificity as a means of minimizing false positives, for the purposes of research, the practice of transforming raw scores disallows true variation, and results in artificial *floor* as well as *ceiling* effects. As such, the present analysis utilized raw, untransformed EDI-2 item scores. This decision was made with confidence given the results obtained by Schoemaker, Strien, and van der Staak (1994), and the subsequent results of van Strien and Ouwens (2003) who found that in a nonclinical female sample, using untransformed scores on the EDI greatly improved the psychometric properties of all the EDI subscales. In fact, van Strien and Ouwens report that based on untransformed responses, the EDI-2 has greater accuracy in classifying both nonclinical and clinical individuals into their appropriate group than it does when transformed scores are utilized. They further assert that previous suggestions that the EDI has low validity in nonclinical samples may be directly attributable to the low variability of the data resulting from scale transformation.

Procedure

Non-Clinical Sample

The data collection procedure in the non-clinical sample required the involvement of teachers, and was facilitated by the counsellor in charge of coordinating the Career and Personal Planning classes at each of the schools. Each teacher who agreed to have their class participate in the project was assigned the task of administering the test materials to the students in their charge. Most of the testing took place in the context of a career and personal planning class, although some of the students from Richmond secondary school were tested during their English classes. Only those students whose parents did not return a signed negative consent form were eligible to participate. In order to ensure informed consent on the part of the students whose parents had allowed their participation, students were explicitly told prior to the study's commencement that

their participation in the project was completely voluntary, and that they were free to withdraw their participation at any time, should they so choose.

Prior to the administration of the instruments of interest, the students were required to read and sign a consent form (see Appendix F) which informed them of the nature of the study and its procedure. In addition, the consent form advised them of their rights as participants, including the right to withdraw from the study at any time. In order to ensure anonymity of responses, the completed consent forms were collected by the teacher prior to the distribution of the questionnaire packages and placed in an envelope which was then sealed. The testing instructions given to the students were standardized, as each teacher involved in the administration of the study materials was provided with a detailed and precise script to follow. As it was also decided to collect follow-up data on the eating disorder-related instruments one year following the initial testing (for the purposes of an unrelated study), students were asked to create a seven-digit code to enter onto their research packages so that the data obtained at these two collections could be matched. In order to secure the students' confidence that their responses to the questionnaires would be completely voluntary, this code was designed so that identification of the student from their code would not be possible.

Once the students' written consent was obtained, they were asked to complete the subject information sheet, followed by the Offer Self-Image Questionnaire (Offer, Ostrov, Howard, & Dolan, 1992), which was administered for the purposes of a prior study, and not relevant to the present analysis. The Eating Disorder Inventory-2, Health Information Questionnaire (HIQ), and Geller, Johnston, and Madsen's (1997) Shape and Weight Based Self-Esteem Index (SAWBS; also not relevant to the present analysis) comprised the remaining measures of the questionnaire package. In order to prevent students from completing the front page of the Eating Disorder Inventory-2 (EDI-2), which requires them to provide personal and identifying information, a piece of blank paper was affixed to the front of the item booklet which instructed the students to proceed directly to Question 1. This preventative measure was taken so that students would not mistakenly write their name on the testing material, thereby invalidating the anonymous method of self-report for this study.

The entire initial testing procedure typically required between 50- and 90-minutes to complete, although some students, particularly those for whom English was a second language, required a lengthier testing period. As such, testing was typically done over two consecutive class periods. Following the completion of the measures, the test administrator read aloud a prepared debriefing script which thanked the students for their participation and outlined the purpose of the study. Participants were also provided with an information sheet (Appendix G) which contained both a summary of the participant consent form as well as further information on the study. In addition to outlining the procedure and rationale of the study, this form provided the students with the names of individuals to contact should they desire further information or wish to voice concerns about the study, and contained information regarding resources available to those who felt they may have problems with their eating. Specifically, telephone numbers were provided for the local community mental health centre (Richmond Mental Health; Maple Ridge Mental Health), the British Columbia chapter of Anorexia Nervosa and Associated Disorders (ANAD), the British Columbia Dietitians' and Nutritionists' Association, and the Eating Disorder Resource Centre of British Columbia. Lastly, participants were provided with an optional feedback form (Appendix H), should they wish to submit comments on their involvement with the study to the Chair of the Simon Fraser University Research Ethics Committee. A second testing of students from Crofton House and Richmond schools was completed (for the purposes of a planned future analysis) approximately one year following the initial assessment, using the same instruments and procedures.

Clinical Sample

The testing procedure for the live data collection of clinical participants was one in which the addition of relevant test questionnaires were incorporated into the hospital or eating disorder centre's initial intake assessment. This was the case both for the Westwind Eating Disorder Recovery Centre and the University of Alberta Hospital's Eating Disorder Unit. As part of the initial intake procedure of both of these treatment facilities, the Eating Disorder Inventory-2 (Garner, 1991) is routinely administered. As

such, the staffs appointed as site coordinators for this project were asked to submit to each consenting participant a questionnaire package which included the following measures: the Subject Information Sheet and the Health Information Questionnaire (HIQ; cited in Geller, Johnston, & Madsen, 1997). It was decided by the investigator of the study not to include the other questionnaires, which were included in the study package for the non-clinical group (the Offer Self-Image Questionnaire (Offer, Ostrov, Howard, & Dolan, 1992), and the Shape and Weight-Based Self-Esteem Inventory (Geller et al., 1997), which were measures of interest for an earlier unrelated study, in order to increase the likelihood that potential participants would not be deterred from participating due to a lengthy testing duration.

At the time of initial contact with a new patient, staff at the treatment centres informed the patient of the opportunity to participate in the study, and provided them with consent forms and information sheets for both participants (Appendix I) and parent/guardians (Appendix J). Upon receipt of assenting and completed parent/guardian and participant consent forms, the staff placed these forms in a manila envelope reserved for completed consent forms only. In order to increase confidence of testing procedure standardization, prior to providing the participant with the package of questionnaires, staff read to the individual the same test administration script as was provided to the non-clinical sample. Study participants were permitted to complete the research package on their own time, returning the completed questionnaires in the envelope, sealed, to the staff member as soon as was feasible. As was the case with the sample of nonclinical participants, the clinical participants were provided with a feedback form (Appendix H) should they wish to comment on their experience of the study to the Chair of the Simon Fraser University Research Ethics Committee.

Given the difficulty of obtaining sufficient numbers of clinical participants through the recruitment of current eating disorder patients, it was decided to augment the clinical sample with archival data collected from patients of eating disorder programs. Collection of archival data was completed with file information of present and former patients of the Calgary Counselling Centre and the British Columbia Children's Hospital's Eating Disorder Unit. As per their request, the Calgary Counselling Centre assigned volunteer

staff to sort through files of previous and current clients to identify those who had completed the Eating Disorder Inventory-2 as part of their intake procedure. These volunteers then submitted the EDI-2 raw scores for each individual, along with their *DSM-IV* diagnosis attained by clinical interview at the time of initial intake. The sample obtained from this Centre consisted of file information for 41 females, ranging in age from 14 to 36. In order to maximize comparability of participants, only those individuals aged 19 or younger were included in the analysis. Three potential participants were thus excluded, with 38 remaining from this sampling.

In order to obtain archival data from the British Columbia Children's Hospital's Eating Disorder Program, the researcher was given permission to sort through the files of current and former patients to identify those with *DSM-IV* diagnosed eating disorders who had completed the Eating Disorder Inventory-2 at intake, and who had provided consent for their file information to be used in future research. Once these participants were identified, their diagnostic and EDI-2 information were included for analysis. Participants obtained in this manner from the BC Children's Hospital's Eating Disorder Program represent the majority of the clinical participants in this study (n=65).

Classification of Participant Groups

The placement of participants into classification groups (apart from those obtained through the use of archival data) was made on the basis of their responses on the Health Information Questionnaire (HIQ; cited in Geller, Johnston, & Madsen, 1997). As mentioned previously, this measure consists of questions aimed at assessing the presence, frequency, and duration of those eating disorder-related attitudes and behaviours required to make a *DSM-IV-TR* diagnosis of anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified. Participants were classified into one of five groups, and the criteria for inclusion for each group are presented below.

Asymptomatic (ASY)

The asymptomatic group was defined by the absence of any binging or purging behaviour as assessed by the HIQ. The criterion for inclusion was the endorsement of never to the HIQ questions assessing (a) binge frequency, (b) the frequency to which one feels that they cannot control their eating, (c) how frequently they attempt to control their weight by exercising, and (d) how often they crash diet, fast, or make use of diet pills/medication, diuretics, vomiting, laxatives, or enemas for the purposes of controlling weight.

Normal (NOR)

The need for a group of non-asymptomatic normals, was informed by previous research which illustrates that many females exhibit some degree of disordered eating (e.g., Nylander, 1971), to the extent that disordered eating can be considered somewhat *normative* (Polivy & Herman, 1987). In addition, when initially structuring the groups, it was apparent that the significant number of participants (n=424, amounting to 68% of the total sample) who were not captured by the eating disordered, the subclinical, and the asymptomatic categories, would require at least two further groups to adequately separate the sample. This separation would be important from a clinical perspective, in terms of adequately defining meaningful subgroups representing increased levels of eating disordered behaviour, but below the level of a subclinical eating disorder. In addition, creating these distinctions was important to provide for meaningful statistical comparisons, in order to ensure that one very large participant group would not exert too much influence in the planned analyses.

In order to meet the classification criteria for inclusion in the normal group, participants' endorsements of items on the HIQ had to exhibit the following pattern: (a) acknowledgement of binging [i.e., experiencing episodes of eating a large amount of food in a relatively short amount of time (i.e., less than 2 hours)] which occurs at a frequency of once a month or less in the last three months, and (b) stating that they hardly ever or never feel that they cannot stop or control their eating. In addition,

participants were required to report either (c) exercising at least once a month (in the last three months) for the purposes of controlling weight and/or (d) going on a crash diet once in the last year. Lastly, normals were required to have responded never to questions assessing the use of fasting, diet pills/medication, diuretics, vomiting, laxatives, or enemas for the purposes of weight control.

Symptomatic (SYM)

Participants in this category were required to evidence a greater level of eating pathology than their asymptomatic or normal counterparts, but to not be diagnosable at the level of a subclinical eating disorder. Therefore, this category captures those individuals who did not meet the inclusion criteria for the eating disordered, subclinical, normal, or asymptomatic participant groups. This default method was deemed both desirable and appropriate given that one of the primary foci of this study was to look at the sample inclusively, without excluding individuals because they did not fit the a priori classification rules, while still creating a *continuum of severity* in terms of eating pathology. Individuals who comprise this group include those who report binging at a frequency of less than two times per week, with or without a feeling of control during the binges, and/or acknowledge the use of purging (using crash dieting, diet pills/medication, diuretics, vomiting, laxatives, and/or enemas), but who would not meet the criteria for a *DSM-IV* diagnosis of eating disorder not otherwise specified.

Subclinical (SUB)

The subclinical group is comprised of those individuals who meet the criteria of an eating disorder not otherwise specified (EDNOS) as outlined in the *DSM-IV-TR*. Subclinical diagnostic groups (see Table 3) included low-weight anorexia (who meet all the criteria for anorexia nervosa, but are within the normal weight range), menstruating anorexics (meeting all of the anorexia nervosa criteria apart from amenorrhea), subclinical bulimia nervosa (who meet all of the *DSM-IV-TR* criteria for bulimia nervosa, apart from the frequency or duration stipulations), nonbinging bulimia nervosa (who

purge but do not binge), and binge eating disorder (currently in the *DSM-IV-TR*'s categories for further consideration). While this group includes individuals from both the school sample and the sample obtained from the community treatment centres, it also includes participants obtained from clinical sites who have an EDNOS diagnosis.

Table 3. Composition of Subclinical Group

Diagnosis (*DSM-IV-TR*)	*N*	%	Cumulative %
Low weight anorexia nervosa	8	16	16
Menstruating anorexia nervosa	12	23	39
Subthreshold bulimia nervosa	29	57	96
Non binging bulimia nervosa	2	4	100
Binge eating disorder	0	0	100

Eating Disordered (ED)

This group is comprised of those individuals who currently meet all of the *DSM-IV-TR* criteria for a diagnosis of anorexia nervosa or bulimia nervosa. Participants identified as having bulimia nervosa who were attained from live data collection were required to have endorsed HIQ items at criterion levels (at least twice per week for the past three months) for binge eating behaviour (including a feeling of not being in control of eating during binges), as well as for purging, through any combination of methods, including exercise with the primary intention of burning calories. In addition, they must have endorsed the HIQ item assessing the extent to which self-esteem has been affected by their shape and weight with an answer of "to a very large extent" or "almost entirely." Anorexic individuals were identified as those who possess a Body Mass Index less than 18, as well as who report an absence of menses for at least three consecutive months over the past year, which occurred during a time of weight loss and in the absence of any other known physical condition (e.g., illness, pregnancy, or change in contraceptive pill). In addition, potential anorexics were required to have reported that their self-esteem was affected by their shape and weight to a very large extent or

entirely, and/or responded "no risk at all" to a question stating: "In the last 3 months, have you felt that being at your current weight presents any significant health risks?" While it is possible to further classify anorexic participants into restrictor and binge/purge subtypes, this delineation was not required for the purposes of the present analysis.

Those eating disordered participants who were obtained through the use of archival data were placed into the eating disordered group by virtue of their clinical diagnosis of anorexia nervosa or bulimia nervosa as recorded in their hospital patient chart. The fact that these diagnoses were made through a process of in-depth clinical interview, and were based on the frequency and duration of symptoms which correspond to the *DSM-IV* required criteria for an eating disorder diagnosis, was well documented in the patient charts. The composition of the eating disordered group is represented in Table 4. A total of 60 cases of anorexia nervosa (41 of the restricting subtype and 19 of the binge/purge subtype) were identified, as were 33 cases of bulimia nervosa (21 of the purging subtype and 12 of the nonpurging subtype).

Table 4. Composition of Eating Disordered Group

Diagnosis	*N*	%	Cumulative %
Anorexia Nervosa (*n*=60)			
restricting subtype	41	44	44
binge/purge subtype	19	20	64
bulimia nervosa (*n*=33)			
purging subtype	21	23	87
nonpurging subtype	12	13	100

The decision to combine both anorexia and bulimia into one group was informed by two main factors. First, there is much research to suggest that anorexic and bulimic patients resemble each other in many respects (e.g., Pryor, Wiederman, & McGilley, 1996), including their responses on the EDI in terms of both profile features and in terms of overall scores (e.g., Polivy & Herman, 1987). Indeed, Gleaves, Lowe, Snow, Green, and Murphy-Ebernez (2000) found that the restricting form of anorexia nervosa is more

distinct from the binge/purge anorexia subtype than the binge/purge anorexia subtype is from bulimia nervosa. Second, there is substantial evidence that much heterogeneity exists and shifting occurs within and between the formal eating disorders (e.g., Bulik, Sullivan, Fear, & Pickering, 1997; Herzog, Hopkins, & Burns, 1993). In their review of eating disorder types, Vitousek and Manke (1994) caution that "the pool of participants fitting a particular subgroup will consist of some who have reached their terminal eating disorder classification and some who are merely passing through a symptom phase on their way to a different category" (p. 138).

The frequency distribution of each of the participant groups is presented in Table 5. Of the 627 participants, 15% (n=93) were eating disordered, having met the *DSM-IV-TR* criteria for either anorexia nervosa or bulimia nervosa. The subclinical group, which accounted for 8% of the sample (n=51), fulfilled the criteria for a *DSM-IV-TR* diagnosis of eating disorder not otherwise specified. The largest group, amounting to 45% of the participants, was the symptomatic group (n=284), who evidenced a level of either binging, restricting, or weight control practices above and beyond that which was allotted to the normal group. The second largest group, the normal group (n=140), accounted for 22% of the total sample. Lastly, the asymptomatic group, with its 59 participants, accounted for only 9% of the participant sample.

Table 5. Frequency Distribution of Groups

Group	Frequency	Percent	Cumulative Percent
asymptomatic	59	9.4	9.4
normal	140	22.3	31.7
symptomatic	284	45.3	77.0
subclinical	51	8.1	85.1
eating disordered	93	14.8	100.0
Total	627	100.0	100.0

In terms of the distribution of clinical and non-clinical subjects across the five groups, the patient sample accounted for 0 of the asymptomatics cases, 2 of the normal cases, 11 of the symptomatic cases, 19 of the subclinical cases, and 83 of the eating disordered cases. Within the nonclinical sample of schoolgirls, the distribution of cases was as follows: 59 in the asymptomatic group, 138 in the normal group, 273 in the symptomatic group, 32 in the subclinical group, and 19 in the eating disordered group.

A one-way analysis of variance indicated a significant overall difference in age between the groups ($p<.05$). Post hoc comparisons using the Bonferroni procedure to control for familywise error rate indicated that significant group differences existed only between the normal and the symptomatic groups, and the normal and the eating disordered groups. While these differences were found to be significant, it is doubtful that they are meaningful, given the mean ages of the normal (14.86 yrs), symptomatic (15.33 yrs), and eating disordered (15.62 yrs) groups.

RESULTS

Preliminary Analysis

Table 6 presents the means and standard deviations of the five participant groups on each of the Eating Disorder Inventory-2 (EDI-2) subscales. ANOVAS on each of the eight EDI-2 subscales identified significant group differences ($p<0.05$), apart from the Maturity Fears subscale ($p=0.081$) in which no significant group differences were identified. Post hoc testing was performed, using the Bonferroni procedure to control familywise error rate, which identified that the eating disordered and the subclinical group did not significantly differ on any of the eight EDI-2 subscales, apart from the Body Dissatisfaction subscale, in which the subclinical group scored *higher* than the eating disordered group. The asymptomatic and the normal group did not differ on the majority of the EDI-2 subscales, with the exception of the Drive for Thinness and the Perfectionism subscales, on which the normal group scored higher than the asymptomatics.

Table 6 ***Means and Standard Deviations of the Eight EDI-2 Subscales According to Group***

EDI-2 Subscale	Asymptomatic (*n*=59)		Normal (*n*=140)		Symptomatic (*n*=284)		Subclinical (*n*=51)		Eating Disordered (*n*=93)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Drive for Thinness	10.66	3.54	15.69	6.00	24.67	7.83	34.67	7.32	33.62	8.59
Bulimia	10.23	2.97	11.69	3.30	16.24	5.82	21.12	6.59	22.58	10.26
Body Dissatisfaction	18.49	7.22	28.36	9.99	36.61	10.72	46.10	8.43	40.94	11.36
Ineffectiveness	20.59	7.73	22.47	6.46	28.06	9.03	36.67	9.03	38.00	11.15
Perfectionism	18.00	5.97	20.76	5.75	21.91	5.95	23.65	5.84	24.12	6.72
Interpersonal Distrust	18.47	7.29	17.85	5.73	19.34	6.53	23.22	6.41	23.84	6.64
Interceptive Awareness	21.24	7.12	23.06	6.90	28.90	8.66	36.53	8.40	38.92	10.44
Maturity Fears	25.20	7.44	25.80	5.70	26.61	6.92	27.33	9.12	28.08	8.58

Discriminant Function Analysis

The eight EDI-2 subscales were subjected to a discriminant function analysis in order to determine how many dimensions were required to adequately account for differences on these subscales among the five participant groupings. The resulting data are presented in Table 7.

Table 7. Summary of Canonical Discriminant Functions

		Eigenvalues		
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.1999	88.8	88.8	.738
2	.139	10.3	99.1	.350
3	.007	.5	99.6	.085
4	.005	.4	100.0	.072
		Wilks' Lambda		
Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1 through 4	.394	576.632	32	.000
2 through 4	.867	88.556	21	.000
3 through 4	.988	7.673	12	.810
4	.995	3.189	5	.671

As can been seen in Table 7, two significant ($p<0.00$) discriminant functions were extracted. The first function accounted for 88.8% of the between-group variance in EDI-2 subscale scores, while the second discriminant function accounted for an additional 10.3% of the between-group variance. Given that the second function is clearly significant, and that 10% of the variance is a non-negligible amount, this function was retained for further investigation. Combined, the two identified, statistically significant discriminant functions were able to account for 99.1% of the between-group variance on the EDI-2 subscale scores.

The interpretations of each of the two significant discriminant functions were made on the basis of the overall correlations between each of the functions and the eight

EDI-2 subscales, as well as the weights that are used to determine scores on each of the functions. The results are presented in Table 8. On the first discriminant function, the EDI-2 subscale of Drive for Thinness had by far the highest association with the function, with a correlation of 0.971. Although other subscales demonstrated strong associations with the first function, with correlations in the range of 0.73 to .75 [Interoceptive Awareness (0.753), Ineffectiveness (0.734), Body Dissatisfaction (0.737), and Bulimia (0.735)], the extremely high association of the Drive for Thinness subscale reduces the importance that we might otherwise attach to them. Correlations of the remaining three EDI-2 subscales with the first function were very low in comparison, with Interpersonal Distrust at 0.388, Perfectionism at 0.339, and Maturity Fears at 0.152. This discriminant function, with its extremely high correlation with the EDI-2 Drive for Thinness subscale, was titled *thinness strivings*.

Correlations of the EDI-2 subscales with the second discriminant function (see Table 8) demonstrated an interesting pattern. The highest correlation was that between the discriminant function and the EDI-2 Body Dissatisfaction subscale, which had a positive correlation of 0.546. Apart from minimal positive correlations on the Drive for Thinness subscale (0.139) and the Perfectionism subscale (0.126), the remainder of the EDI-2 subscales were negatively correlated with this function. Three of the five remaining subscales demonstrated correlations greater than -0.200 [Interoceptive Awareness (-0.237), Interpersonal Distrust (-0.333), and Ineffectiveness (-0.221)], while Bulimia (-0.147) and Maturity Fears (-0.031) were weaker in their association with this function. In this function, body dissatisfaction has contrasting relations with eating-disorder-related psychopathology (as reflected in the EDI-2 subscales of Ineffectiveness, Interoceptive Awareness, and Interpersonal Distrust), and as such, it will be termed body *dissatisfaction/psychopathology*.

Table 8. Correlations Between Discriminant Functions and the Eight EDI-2 Subscales

EDI-2 Subscale	Discriminant Scores from Function 1	Discriminant Scores from Function 2
Drive for Thinness	.971	.139
Bulimia	.735	-.147
Body Dissatisfaction	.737	.546
Ineffectiveness	.734	-.221
Perfectionism	.339	.126
Interpersonal Distrust	.388	-.333
Interoceptive Awareness	.753	-.237
Maturity Fears	.152	-.031
EDI-2 Subscale Standardized Canonical Discriminant Function Coefficients	**Function 1**	**Function 2**
Drive for Thinness	.792	-.173
Bulimia	.207	-.149
Body Dissatisfaction	-.077	1.121
Ineffectiveness	.196	-.358
Perfectionism	.027	.216
Interpersonal Distrust	-.031	-.335
Interoceptive Awareness	.125	-.321
Maturity Fears	-.109	.182

Table 9 indicates the placement of each of the group means on the two significant discriminant functions. On the first function, first glance would suggest that a linear pattern exists, with group means increasing as one moves from the least to the most pathological group classification. The mean of the asymptomatic group is at -1.756, with the normal group falling at -1.155, the symptomatic group at 0.118, the subclinical group at 1.592, and the eating disordered group at 1.619. A one-way Analysis of Variance procedure was performed on the groups' centroid scores on the first discriminant function, and this indicated a significant overall effect ($F=21.687$, $p<.000$). Pairwise contrasts of group means on Function 1 were done using the

procedure prescribed by Harris (1985, Table 4.3), with stepwise Bonferroni corrections. Significant differences were found only between the normal and the symptomatic (p<0.0001) and the symptomatic and the subclinical groups (p<0.0001). On this function, the normal and the asymptomatic groups do not significantly differ, nor do the subclinical and the eating disordered groups.

Table 9. Functions at Group Centroids

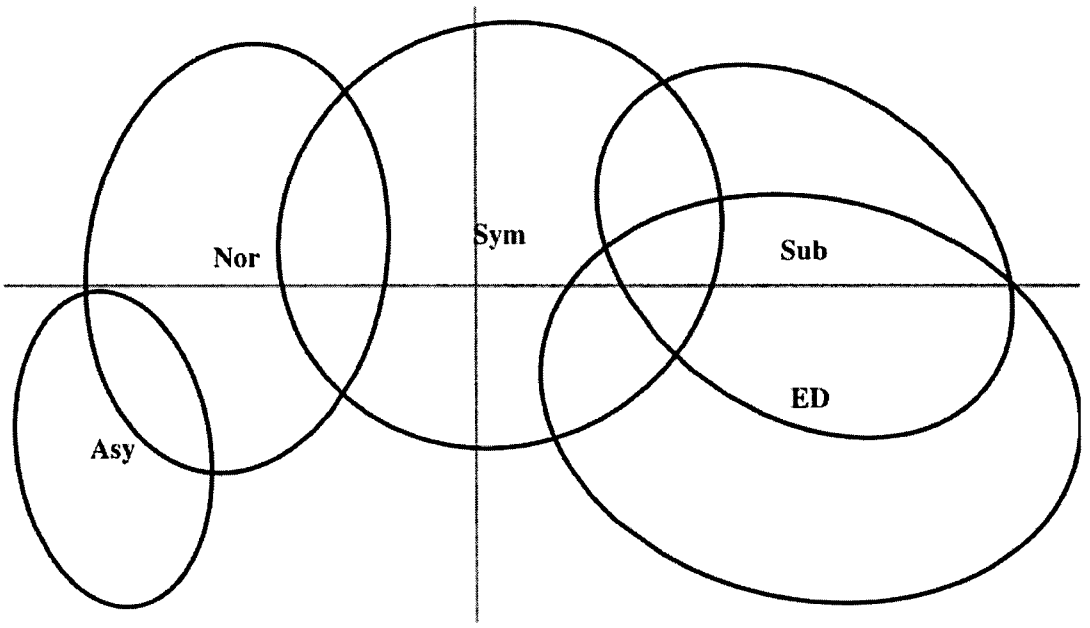
Group	Function	
	1	2
Asymptomatic	-1.756	-.794
Normal	-1.155	.134
Symptomatic	.118	.248
Subclinical	1.592	.169
Eating Disordered	1.619	-.549

On the second identified discriminant function, the placement of group centroids (see Table 9) on the function shows a dramatically different pattern. There is an initial increasing rise in group centroids as one moves from the asymptomatic (-0.794) to the normal (0.134) to the symptomatic (0.248) participant groupings. However, a decline (although not significant between the symptomatic and the subclinical groups) occurs such that the subclinical mean is at (0.169), followed by a dramatic drop to the group centroid of the eating disordered group, which falls at -0.549. This pattern of centroid distribution across the participant groups appears to be extremely unusual and perplexing, as the eating disordered group, who demonstrate the most severe form of disordered eating, score in the same direction (negative as opposed to positive), and lie very close to, the asymptomatic group on this function. The results of a one-way analysis of variance indicated an overall group effect on this function (F=22.02, p<0.000). Pairwise contrasts of group means on Function 2 were done as on Function 1. Significant differences (p<.000) were found for all groups except for the asymptomatic

and the eating disordered groups, who did not differ from each other (p>0.05) on this function.

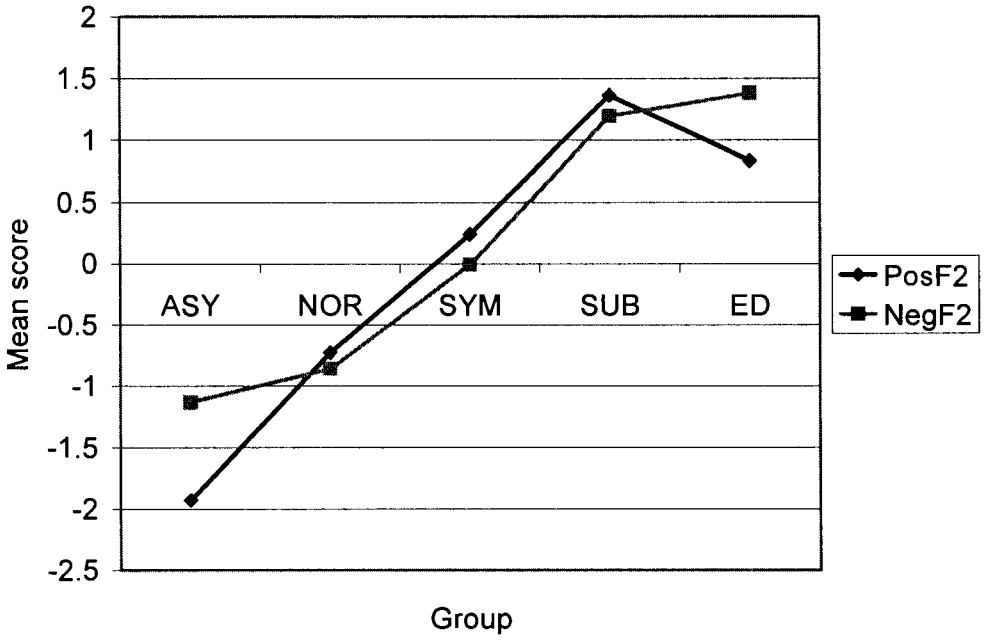
In order to illustrate the distribution of participant scores on the two identified dimensions, the group centroids on each of the two functions were plotted in order to provide a graphic representation of their placement (see Figure 1). In this graph (where Function 1 is represented by the "x" axis, and Function 2 is represented by the "y" axis), the mean of each group on each of the two discriminant functions is indicated by the center of its sphere, and the shape of the sphere is determined by the within group variance of scores on the two functions. As can be seen, the result is an inverted "U" shape pattern, with the asymptomatic and the eating disordered groups as anchors on the negative side of the "y," axis, and the normal, the symptomatic, and the subclinical groups on the positive side of the "y" axis, which represents the second discriminant function.

Figure 1. Group Means on Function 1 and Function 2



As Function 2 can be seen as a contrast of the weighted sum of the positive and the negative components of that function, in order to further explore the nature of the second discriminant function, it was decided to split the function into two separate components; a positive component (F2pos) representing all of the EDI-2 subscales which demonstrated positive weights in terms of their standardized canonical discriminant function coefficients on Function 2 (Drive for Thinness, Body Dissatisfaction, and Perfectionism) and a negative component (F2neg) consisting of those subscales which demonstrated negative coefficients on Function 2 (Bulimia, Ineffectiveness, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears). A score was then calculated for each subject on F2pos and F2neg, and means for each of these components calculated for each group. The standardized group means on F2pos and F2neg are presented in Figure 2. In order to facilitate discussion, F2pos will be referred to as *body dissatisfaction* and F2neg will be referred to as *psychopathology*.

Figure 2. ***Standardized Group Means on Positive and Negative Components of Function 2***



This plot, illustrating the relationship between the standardized positive and negative components of Function 2 by group, exhibits a striking pattern. For the three middle groups (normal, symptomatic, and subclinical), differences in F2pos (body dissatisfaction) almost perfectly parallel differences in F2neg (Psychopathology). However, this pattern breaks strikingly at both ends, for the asymptomatic and eating disordered groups.

The group means on F2pos and F2neg were subjected to ANOVA and post hoc testing, utilizing the Bonferroni procedure to control for familywise error rate. The results of this testing indicated that on F2pos, all groups differed significantly ($p<.001$) apart from the eating disordered and the subclinical groups, and on F2neg, only the three middle groups differed significantly from each other (the normal, the symptomatic, and the subclinical groups), with the eating disordered and subclinical groups not differing significantly and the normal and the asymptomatic groups not differing significantly.

DISCUSSION

In the present study, the primary conclusion is that two discriminant functions are necessary to account for and explain the differences between the groups, who differed in symptomatology with each group showing increasing severity of eating disorder features. The first of the discriminant functions is labelled *thinness strivings*, and it adequately separates the middle three groups (normal, symptomatic, and subclinical). However, it fails to discriminate the asymptomatics from the normals, and more importantly, the subclinicals from the eating disordered. The second function, which we will refer to as *body dissatisfaction/psychopathology*, is required to differentiate the subclinical group from the eating disordered group.

While the nature of the second discriminant function was not immediately apparent, the relationship that it captures became clear with the separation of the function into its positively and negatively weighted components. While initially perplexing and perhaps even illogical, upon consideration of the patterns evident in the plots of F2pos and F2neg, it may be the case that the similarity observed between the asymptomatic group and the eating disordered group (in terms of their scores on the second discriminant function) is due to the fact that both groups represent an atypical extreme. The scores of the asymptomatic group on the F2pos (body dissatisfaction) component of Function 2 of body dissatisfaction/psychopathology may be very low because by virtue of their group membership, this group denied any eating disorder symptomatology. However, they nonetheless remain an atypical group, both because of their low level of body dissatisfaction and the higher level of psychopathology they demonstrate in comparison to their level of body dissatisfaction. This pattern is reversed and consistent among the "middle" three participant groups; the normals, the symptomatics, and the subclinicals. Then, the pattern shifts in the eating disordered group, who evidence lower levels of body dissatisfaction than the subclinical group. However, the eating disordered group's body dissatisfaction scores are superseded by the level of their scores on the psychopathology component on the function.

In ascertaining the significance of this second function of body dissatisfaction/psychopathology, and its representation of the relationship between levels of body dissatisfaction and eating-disorder-related psychopathology, it is perhaps first important to consider what it *does not* represent. If this function were *only* related to body dissatisfaction, then only the EDI-2 Body Dissatisfaction subscale would have demonstrated its relevance with respect to the function. Similarly, if the function were indicative *only* of psychopathology (in terms of Ineffectiveness, Interoceptive Awareness, and Interpersonal Distrust in particular), then body dissatisfaction would not have shown itself to be important to the function.

In contrast to the first discriminant function, the second discriminant function effectively separates the subclinical from the eating disordered group. However, interestingly, the eating disordered group did not exhibit higher scores than the subclinical group on the EDI-2 subscales of Ineffectiveness, Interpersonal Distrust, and Interoceptive Awareness. As a consequence, it can be concluded that it is not the level of psychopathology that effectively distinguishes these groups, but rather it is specifically the relationship between body dissatisfaction and Psychopathology that is important. Also, one must note that utilizing raw, untransformed EDI-2 scores (i.e., 1-6 scoring) instead of transformed (i.e., 0-4 scoring) scores reduced the likelihood of floor effects on all of the EDI-2 subscales, but did not of course impact potential ceiling effects. However, in the present analysis, ceiling effects would only be relevant for the F2neg scores of the eating disordered group, and if removed, would only result in an increase in the observed difference between this group's F2neg and F2pos scores.

With respect to the meaning of the second discriminant function (of body dissatisfaction/psychopathology), it is reasonable to conclude that whatever it is that distinguishes the eating disordered and the subclinical groups, it cannot be explained by body dissatisfaction or by eating disorder-related psychopathology alone. What is certain is that the second function represents body dissatisfaction and its relation to the three psychopathological indices. However, the meaning of this relationship is not as easy to define. With the subclinical group scoring similarly to the eating disordered group on the psychopathology indices while scoring *higher* than the eating disordered

group on the Body Dissatisfaction subscale, there is something important and intriguing about the fact that among the eating disordered individuals, their high levels of psychopathology occur in the context of relatively lower levels of body dissatisfaction.

After the findings of the present study were considered, and upon re-review of the eating disorder literature, it was discovered that similar results to those outlined above have been reported in previous studies. However other researchers have not interpreted their findings as evidence of the unique nature of the eating disorder group. For example, in reporting the results of their comparison of normals, chronic dieters, bingers, purgers, subthreshold bulimics, and bulimics, Mintz and Betz (1988) presented a plot of group means (left largely uninterpreted) on an index of self-esteem and an index of body satisfaction that in fact mirrors the characteristics of Function 2 when parcelled into F2pos and F2neg. Their plot indicates a relationship between body satisfaction and self-esteem which is consistent across all groups (with levels of body satisfaction being lower than levels of self-esteem) except for the bulimic group, for whom the relationship reverses. Thus, the Mintz and Betz data show a markedly similar pattern to that observed in the present study.

In regards to the so-called "continuity versus discontinuity" debate, the results of the present study are not supportive of the continuity perspective in several ways. First, the finding that the first discriminant function does not differentiate the subclinical and the eating disordered groups is not consistent with the continuity hypothesis of eating disorders, which would predict that significant increases on the dimension would occur up to and including the level of the eating disordered group. Second, the fact that a second significant and interpretable discriminant function was identified, and given that it effectively discriminates between the subclinical and the eating disordered groups, also is not consistent with the continuity hypothesis.

Overall, the results of the current study corroborate the results of earlier studies which suggest that eating disorders are best conceptualized as consisting of two separate dimensions. The first dimension, capturing a central feature common to both anorexia and bulimia nervosa, and represented by the first discriminant function, reflects strivings for thinness and one's level of motivation to achieve or maintain a thin body

shape. This dimension effectively discriminates between the normal, the symptomatic, and the subclinical groups. However, a second dimension, representing the amount of discrepancy between body dissatisfaction and psychopathology (as captured by the EDI-2 subscales of Ineffectiveness, Interoceptive Awareness, and Interpersonal Distrust), is required to distinguish the eating disordered group from the subclinical group.

The most compelling information provided by the present study which can inform the continuity/discontinuity debate comes from the results provided by separating Function 2 into its positive and negative components. The plotting of difference scores from splitting the second discriminant function into its positive and negative components, and the resulting pattern that emerges (as presented in Figure 2), provides persuasive evidence that when explaining the variance between the subclinical and the eating disordered groups, a *different difference* occurs. That is to say that when describing individuals with *DSM-IV-TR* diagnosable anorexia or bulimia nervosa, *a different kind of information* must come into play. The present finding suggests that the information needed to describe the eating disordered group (namely greater eating disorder-related psychopathology in comparison to level of body dissatisfaction) is *different* than the information needed to define those groups with eating disordered behaviours which are less than the level of a formal diagnosable eating disorder (namely higher body dissatisfaction than eating disorder-related psychopathology). The existence of this pattern in the current data serves both to increase confidence that the relationship suggested by the correlations of the EDI-2 subscales with the function is meaningful, as well as to provide confidence in the interpretation of Function 2 as representative of body dissatisfaction/psychopathology.

In sum, it is thus apparent that there is indeed something different about those individuals with eating disorders that distinguish them from all others who exhibit a spectrum of eating disordered behaviour ranging from the normal to the symptomatic to the subclinical level. In addition, those individuals who deny any presence of eating disordered behaviour, who were captured in the asymptomatic group, also appear to be a distinctly different group from these middle three groups.

The most parsimonious explanation for the similarity of the asymptomatic and the eating disordered groups would be that the psychological process or characteristics captured by Function 2 for both the asymptomatic and the eating disordered groups is a similar one. Perhaps it is possible that both the asymptomatic individuals and those with anorexia or bulimia nervosa under-reported on items related to body dissatisfaction, either consciously or unconsciously, resulting in artificially lowered scores on the EDI-2 Body Dissatisfaction subscale. It is also possible that both groups over-reported on the psychopathological subscales, again, either consciously or unconsciously. However, each of these possibilities seems rather unlikely, as it is difficult to conceive of convincing reasons why both asymptomatic and eating disordered individuals would be compelled to under-report in one area and/or over-report in another area of functioning, particularly in a similar manner.

An alternate explanation for their similarity on Function 2 is that for both the asymptomatic and eating disordered groups, their psychological status with respect to feelings of ineffectiveness, level of interoceptive awareness, and degree of interpersonal distrust, plays a larger role in determining their group membership with respect to their eating disorder status than does body dissatisfaction. For the asymptomatic group, low levels of psychopathology exist in the context of *even lower* levels of body dissatisfaction. In the eating disordered group, high levels of body dissatisfaction exist in the context of *even higher* levels of psychopathology. In this interpretation, the asymptomatic group, which is atypical in that it represents a deviation from the normal group, while still exhibiting normal levels of eating disorder-related psychopathology, are relatively unaffected by issues related to dissatisfaction with their bodies. This relationship makes them an identifiable group separate from the larger population of individuals who do not have a diagnosis of anorexia or bulimia nervosa.

The most obvious clinical interpretation of this body image/psychopathology relationship dimension is that for individuals with eating disorders, eating disorder symptoms are less driven by body dissatisfaction and more driven by psychopathology than is the case with the subclinical, symptomatic, and normal individuals. Expanding this argument, one might suggest that the eating disorder symptoms exhibited by non-

eating disordered participants are more influenced by external drivers (e.g., sociocultural pressures towards a thin body ideal) and less influenced by internal drivers (e.g., poor interoceptive awareness, feelings of ineffectiveness and interpersonal issues or conflicts) than is the case with anorexic or bulimic participants. It could then be speculated that the subclinical individuals, who demonstrate levels of psychopathology equal to the eating disordered group (and body dissatisfaction levels *higher* than those of anorexics and bulimics), but exhibit less severe forms of actual eating disturbance, have a somewhat less benign form of eating disturbance given that its basis is more influenced by external pressures and motives than is the case with clinical eating disordered individuals.

As the present study was cross-sectional in design, thus placing strict limits with respect to interpretations of causality, it might be argued that the results could be explained as reflecting the *consequences* of having an eating disorder. It is certainly possible that as a consequence of developing anorexia or bulimia, one becomes less dissatisfied with their body, and that the drivers of the eating disorder change to reflect a greater influence of psychopathological factors than was the case prior. However, it is also possible that these results are capturing what many proponents of clinically-driven etiological models (i.e., those of Bruch, Crisp, & Selvini-Palazzoli) have long asserted, which is that that some individuals, by virtue of their psychological make-up, are more likely to develop a clinical anorexic or bulimic syndrome than those not in possession of this profile.

The finding in the present analysis that poor Interoceptive Awareness is important to formal eating disorders is perhaps the best illustration of this proposition. Bruch (1982) conceived of anorexia as having its roots in a defective self-concept, and she emphasized the role of poor Interoceptive Awareness, or the inability to distinguish between physical and emotional stimuli, as a key feature of the disorder. In this regard, she hypothesized that:

> The lack of regular and consistent appropriate responses to his needs deprives the developing child of the essential groundwork for his body identity, with accurate perceptual and conceptual awareness of his own functions; instead, he will grow up perplexed when trying to differentiate

> between disturbances in his biological field and emotional and interpersonal experiences. (1982, p. 1533)

As a consequence, it may be that there is a channelling of *all* forms of dissatisfaction and anxiety into attempts to control weight; something the anorexic *can* control. Perhaps this too, can help explain why in the present study, the eating disordered group evidenced less body dissatisfaction than did the subclinical group, if their attempts to control weight have more to do with *inner dissatisfaction* and less to do with *body dissatisfaction* than is the case with subclinical individuals. As Bruch (1973) noted:

> One might say that anorexia nervosa by its very existence proves that the hateful self-contempt is not really related to the excess weight, but to some deep inner dissatisfaction. Not one of the anorexic patients whom I have come to know over the years had set out to reach this state of pitiful emaciation. All they had wanted to achieve was to feel better about themselves. Since they had felt that "being too fat" was the cause of their despair, they were determined to correct it. Whatever weight they reached in this struggle for self-respect and respect from others, it was "not right" for giving them inner reassurance, and so the downhill course continued. (p. 101)

In support of her view, Bruch provided an illustration of an anorexic patient who explained "about being fat I could do something, but not about being ugly...at the same time, she knew that what was covered under the term *ugly* applied as much to psychological attributes and to disappointment in her own achievements and behaviour as to the physical evidence" (1973, p. 101). Although different theorists (i.e., Bruch, Crisp, & Selvini-Palazzoli) have emphasized different psychological features in their etiological models of eating disorders, all have been firm in their contention that the eating and weight-control practices of eating disordered individuals represented attempts to deal with intrapsychic deficits and conflicts.

The EDI-2 subscales of Interpersonal Distrust and Ineffectiveness were also important to the second discriminant function. The core deficit of ineffectiveness, originally described by Bruch (1962, 1973) as a primary etiological factor in the development of primary anorexia, has been a key feature of many clinical formulations

with respect to the development of eating disorders. Thus it is not surprising that ineffectiveness was identified in the present study as important in discriminating the subclinical from the eating disordered in this study. Interpersonal distrust, which was posited by Selvini-Palazzoli (1978) as an important etiological variable, was also important in this discrimination, and reflects both feelings of alienation and the reluctance to engage in close personal relationships with others. The two remaining EDI-2 psychopathology subscales of Maturity Fears and Perfectionism were not found to be meaningfully involved in discriminating the subclinical and eating disordered groups.

It is interesting to note that research examining the prognostic utility of the EDI-2 has supported that in general, with successful treatment, scores on both the symptomatic and the psychological indices of the EDI-2 demonstrate a significant decline in pathology for both anorexics and bulimics (e.g., Manara, Manara, & Todisco, 2005). In addition, Bizeul, Sadowsky, and Rigaud (2001), in their 5- to 10-year follow-up study of anorexic patients, identified that high initial *EDI* total score and high initial scores for *Perfectionism*, *Ineffectiveness, Interpersonal Distrust, Interoceptive Awareness and Drive for Thinness* were significantly associated with a poor prognosis at follow-up. The findings of Manara et al. and Bizeul et al. provide some assurance that the results of the present study are capturing a meaningful construct, and support the importance of the key psychopathological components represented by F2neg for both prevention and treatment efforts.

In evaluating the importance of the second dimension (i.e., body dissatisfaction/psychopathology) in the present analysis, and its potential fit with other putative risk factors identified in research, a consideration of the concept of *silencing the self* is useful. This interpersonal style, related to the type of cognitive schemata one possesses related to securing intimate relationships, is measured by the four subscales comprising The Silencing the Self Scale (STSS; Jack & Dill, 1992). The four subscales tap (a) the tendency to evaluate the self by external standards, (b) the tendency to secure attachments by placing the needs of others before self-needs, (c) inhibiting one's self-expression and action in order to avoid conflict, and (d) presenting an outer compliant self while the inner self remains angry and hostile. Geller, Cockell, Hewitt,

Goldner, and Flett (2000) identified that women with anorexia nervosa score significantly higher on anger expression (as measured by The State-Trait Anger Expression Inventory (STAXI; Spielberger et al., 1985) and on all four of the STSS schemas than do psychiatric and normal controls. In Geller et al.'s study, even when the effects of depression, self-esteem, and global assessment of functioning were controlled, the scores of the anorexic group on the indices measuring self-sacrifice and the tendency to avoid the expression of thoughts and feeling in order to avoid conflict remained significantly higher than those of the two control groups. Most importantly, these results related to the inhibited expression of negative feelings and the identified interpersonal style were found to be associated with the anorexics' negative feelings and thoughts about their bodies. This finding has been cited by other authors (e.g., Zaitsoff, Geller, & Srikameswaran, 2002) as supportive of the hypothesis that "unexpressed feelings may be displaced onto the body" (p. 52). In their discussion of their results, Geller et al. identify three potential interpretations for their findings. First, it is possible that a third variable, such as self-esteem, is responsible for the suppressed negative affect, the body dissatisfaction, and the self-silencing interpersonal style. Second, it may be the case that consistent with the established relationship between anorexia nervosa and poor Interoceptive Awareness, "body dissatisfaction may reflect a difficulty to clearly identify feelings, and possibly a tendency to blur "pure affect" with "body affect" (Geller et al., 2000, p. 17). A third possibility is that the body dissatisfaction for the eating disordered individual reflects a displacement of threatening feelings onto a *safe target*, namely one's body.

While certainly a possibility, it would appear unlikely that the effects of both the interpersonal style of self-silencing and the body dissatisfaction of eating disordered individuals are solely attributable to the influence of low self-esteem. On a rational level, one would expect that the disturbance in interpersonal style and the inhibition of the expression of one's emotions and needs would logically impact general well-being and self-esteem. Indeed, the self-silencing interpersonal stance has been linked with depression and low self-esteem in a number of populations (Jack & Dill, 1992; Thompson, 1995; Sperberg & Stabb, 1998).

Certainly, the results of the present study would be consistent with the first two hypotheses proposed by Geller, Cockell, Hewitt, Goldner, and Flett (2000), and consistent as well with the theoretical conceptualizations which accord psychological determinants an etiological role in eating disorders. Linking together the ideas presented by clinical theorists regarding the specific etiology of eating disorders, it is possible to construct a tentative developmental pathway that incorporates the relationships between key psychological and interpersonal factors. Starting with the influence of deficient early parent-child interactions, one may speculate that basic deficits in psychological functioning develop and result in the establishment of interpersonal distrust, poor interoceptive awareness, and a core feeling of ineffectiveness. This psychological configuration, then coupled by (or even informing) the need for external validation and approval, leads to high self-expectations, a self-silencing interpersonal style, and the suppression of negative or threatening affect. The portrait of the developing anorexic provided by Minuchin, Rosman, and Baker (1978) provides a nice integration of these characteristics and proposed effects:

> The anorexic child has grown up in a family operating with highly enmeshed patterns. As a result, her orientation toward life gives prime importance to proximity in interpersonal contact. Loyalty and protection take precedence over autonomy and self-realization. A child growing up in a extremely enmeshed system learns to subordinate the self. Her expectation from a goal-directed activity, such as studying or learning a skill, is therefore not competence, but approval. The reward is not knowledge, but love. (p. 59)

Once all of these conditions are in place, the experience of emotions and internal sensations are either: missed, misinterpreted, or perceived as threatening, with the end result of the negative emotion being transferred or displaced onto the body. Further support for this hypothesis is found in the results of Triosi, Di Lorenzo, Alcini, Nanni, Di Pasquale, and Siracusano (2006), who in their study of treatment-seeking outpatient anorexics and bulimics, found a high correlation between levels of body dissatisfaction and both separation anxiety symptoms in childhood, as well as an insecure style of adult attachment.

It would seem reasonable that low self-esteem could occur at any or all of these junctures, and quite likely as a result rather than a cause. The combined effects of the distinct psychological structure and interpersonal style, the inhibited expression of emotion, the resultant body dissatisfaction, and efforts toward controlling the body (and emotions) through weight-control measures culminate to render an individual uniquely predisposed to the development of a diagnosable eating disorder. Certainly this hypothesized developmental model represents a speculative effort. However, the fact that there is empirical evidence to document the links between each of these factors is encouraging. Additionally, due to the known multidetermined nature of both anorexia and bulimia (i.e., a *biopsychosocial* model), there are other influences, not considered here (e.g., the influence of societal pressures and cultural stereotypes upon women), which would certainly play a role. Of course, only longitudinal, complex designs could adequately address questions about etiology, and future efforts aimed at verifying the direction of causal links are obviously necessary in this field.

As has been summarized in the introduction to this analysis, a substantial body of research has been undertaken to try and determine whether eating disorders represent a continuous entity. However, in general, the methods utilized to test this question have undermined this effort. In several studies, the *continuous* nature of eating disorders has been conceived of as a mathematical continuity, such that if increases, whether significant or linear in nature, exist between the participant groupings, then support for the continuity theory is asserted to have been achieved. However, as has been argued, the most appropriate test of whether or not a disorder represents a departure from the way its attributes are expressed in the nonclinical population is to test for whether the same variables that distinguish between non-clinical groups and subclinical groups also distinguish between subclinical and clinical groups. The results of the present study, with the finding that a second function came into play to distinguish between the subclinical and the eating disordered group, supports the argument that a *different kind of difference* exists, and that eating disorders are not just a case of eating disturbances taken to an extreme.

With respect to the continuity versus discontinuity debate, it is important to consider that while the findings of the present study are clearly not supportive of the unidimensional continuum model of eating disorders, neither are they consistent with traditionally held notions of discontinuity. Discontinuity has largely been defined by researchers as a mathematical concept analogous to discreteness. However, discreteness versus continuousness has not been an appropriate framework for addressing the question. Discreteness would suggest that there is no possibility of individuals falling in between the group means, which is of course relevant for disease-based models (e.g., *germ theory*, either you have it or you don't), but not relevant to a construct such as eating disorders. A more appropriate way of phrasing the question of interest would be: *Is there a* distinctiveness *to anorexia and bulimia nervosa, rendering these disorders different from subthreshold levels of eating disturbances in that information sufficient to "explain" one is not sufficient to explain the other?* The results of the present study, similar to the findings of Garner et al. (1983, 1984) and Laessle et al. (1989) which are described in terms of a *two component model*, provide support for the hypothesis that anorexia and bulimia nervosa indeed represent distinct entities, and in this manner, differ from the continuum of subthreshold eating disorders. Given the problems associated with the way in which the term 'discontinuity' has been defined in the continuity/discontinuity debate, it is suggested that future discussions and investigations conceptualize the fundamental issue as one of continuity versus *distinctiveness.* In this framework, the results of the present study, taken in light of the findings of Garner et al. (1983, 1984) and Laessle (1989) provide strong evidence for a *distinctiveness hypothesis* of anorexia and bulimia nervosa.

While not central to the present analysis, a number of findings are of interest and worth mentioning. First, it is rather striking that less than 10% of the participants were asymptomatic, in terms of denying the presence of any binging or purging in the past three months. The necessity of having to create a normal category which allows for the presence of at least some level of binging, weight restriction, or weight-control practices, and the fact that this group accounts for 22% of the sample certainly underscores the normative nature of weight-concerns and eating disturbances present in the general population of female adolescents. Even more striking is the fact that a full 45% of the

sample, the largest of the participant groups, fell into the "symptomatic" category, evidencing a greater level of eating disturbance than was referenced for the category of normals. Yet the pattern of results on the EDI-2 subscales, with increases demonstrated on EDI-2 subscales as one moves from the normal to the symptomatic group, provides confidence in terms of the need to distinguish among these two groups, as increased levels of psychopathology tended to occur as the groups progressed in symptom severity.

One of the major strengths of the present study is the fact that it represented an attempt to group individuals based upon naturally-occurring presentations of eating disorder symptomatology, and in a manner consistent with the current diagnostic criteria (*DSM-IV-TR*) for assessing anorexia and bulimia nervosa. In so doing, it was possible to isolate a group of asymptomatic individuals. In this regard, it should be noted that very few studies have made the distinction between asymptomatic individuals, namely those who deny any presence of binging, restricting, or purging, and so-called normals. Had this distinction not been made in the present study, it may have been more difficult to provide a meaningful interpretation of the second discriminant function, which feasibly, could have then resulted in it having been erroneously disregarded.

A second important implication of the present classification method relates to the generalizability of the results. Most of the previous research on the continuity/discontinuity debate, in isolating only certain features of eating disorders in their participant groupings (e.g., unrestrained eaters, restrained eaters, controls), limit the extent to which their results generalize, and thus limit the clinical utility of any findings. It is rare that clinicians encounter eating disordered individuals who *only* binge, or who *only* restrict. The majority of the individuals who present for treatment exhibit a range of symptoms, with much heterogeneity existing in those who do not meet the criteria for anorexia or bulimia nervosa. Due to the manner in which participants were classified in this study, the results generated have a high level of generalizability and therefore clinical utility, being applicable to a broad range and a greater number of people.

The clinical implications of these current findings are two-fold. First, these results would suggest that in terms of identifying those at risk for the future development of anorexia or bulimia nervosa, one should take into account not just their levels of thinness strivings, but also their levels of eating-disorder-related psychopathology (i.e., EDI-2-measured Ineffectiveness, Interoceptive Awareness, and Interpersonal Distrust) and its relation to their levels of body dissatisfaction. Those individuals whose motivations for weight loss appear less related to normal body dissatisfaction and more related to attempts to deal with intrapsychic issues would be considered more at risk, and therapeutic strategies then targeted towards dealing with the issues related to ineffectiveness, interoceptive awareness, and interpersonal distrust as well as to issues related to thinness strivings and body dissatisfaction. It is important to note, however, that subclinical eating disorders are associated with significant levels of distress (Bunnell, Shenker, Nussbaum, Jacobson, & Cooper, 1990; Dancyger & Garfinkel, 1995; Lewinsohn, Striegel-Moore, & Seeley, 2000), and the present results should not be taken to conclude that these individuals do not require attention and treatment. However, it may be the case that a portion of these subclinical individuals may have a more circumscribed presentation, and that treatment for these individuals may not necessarily require the same level of attention to the psychopathological features that are important to address therapeutically in the formal eating disorders.

The present study addressed some of the limitations of past research by means of its classification of participants, retaining all valid protocols for analysis, inclusion of individuals from both patient and non-patient populations, utilization of a *DSM-IV-TR*-based measure of eating disordered symptomatology, and commitment to utilizing a measure of psychopathology (e.g., the EDI-2) which captures in its subscales the key psychopathological factors theorized to be core features of anorexia and bulimia nervosa. Although problems with generalizability may exist, the stability of these findings is strengthened by the large number of individuals who met the criteria for subthreshold or full syndrome eating disorders.

As with all research, there are of course limitations to the current study, and these must be acknowledged. Ideally, in any study involving groups, the representation

of subjects in each group is equal, and this was not the case in the present anaysis. Greater equality of groups, in reducing the standard error of difference between groups, results in an increased probability of detecting between group effects. As such, were the groups more equal in size, this would not have directly affected the results (i.e. the distribution of group centroids), but rather the probability *(p)* values attached to them, thus according the obtained results an even greater level of significance.

Secondly, the reliance on self-report and/or file data carries with it the potential to impact the validity of the results in largely unknown ways. The use of a self-report questionnaire in the non-patient sample for the purposes of assessing eating disorder status may have limited the opportunity to make accurate diagnoses. Ideally, classification would have involved the use of the Eating Disorders Examination (EDE) (Cooper & Fairburn, 1987), considered by many to be the *gold standard* for assessing eating disorders. However, this instrument requires a 60 minute interview of each participant and specific training of the interviewers is required, and as a result, the use of this instrument was not feasible given the constraints inherent in data collection within the schools. Some reassurance was provided by Fairburn and Beglin's (1993) finding that self-report assessment of *DSM* status is roughly comparable to the results obtained through structured interview. However, it is possible that particularly for questions with a greater potential for participant interpretation (e.g., what constitutes a *binge*), symptomatology levels assessed by such items may be artificially inflated.

It is also important to note that as the sample consisted solely of adolescent females, the generalizability of the findings to older populations and to males may be limited, and could be a focus of further study. Additionally, while there may be good justification for combining the anorexic and bulimic participants into one group, it is possible that different results would have been obtained were they treated in separate analyses. Future research efforts could involve replicating the analyses with anorexia and bulimia independently. A final limitation relates to the correlational nature of the present study. As is the case with all non-experimental designs, there are strict limits on making any causal inferences on the basis of the present findings.

Only prospective research can address conclusively the question addressed by the present analysis. Identification of at risk individuals at baseline, and determination of their progression over time would be required to make causal attributions regarding the psychological variables posited to be etiological in the development of anorexia and bulimia nervosa. However, as Polivy and Herman (1987) noted, if a resolution were not achieved with respect to this question, psychology would be in good company with those investigating other psychological disorders who have strived to resolve a similar debate, namely the continuity or discontinuity of specific psychological disorders.

REFERENCES

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., Revised). Washington, DC: Author.

American Psychological Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Attie, I., & Brooks-Gunn, J. (1989). Development of eating problems in adolescent girls: A longitudinal study. *Developmental Psychology, 25,* 70-79.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory,* 2nd ed. San Antonio, TX: The Psychological Corporation.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 5,* 561-571.

Bizeul, C., Sadowsky, *N.*, & Rigaud, D. (2001). The prognostic value of initial EDI scores in anorexia nervosa patients: A prospective follow up study of 5-10 years. *European Psychiatry, 16,* 232-238.

Bohrnstedt, G. W. (1977). *On measuring body dissatisfaction.* Unpublished manuscript. (Indiana University, Bloomington, IN)

Boskind-Lodahl, M. (1976). Cinderella's stepsisters: A feminist perspective on anorexia nervosa and bulimia. *Signs, 2,* 342-356.

Brooks-Gunn, J., Burrow, C., & Warren, M. P. (1988). Attitudes toward eating and body weight in different groups of female adolescent athletes. *International Journal of Eating Disorders, 17,* 749-757.

Bulik, C. M., Sullivan, P. F., Fear, J. L., & Pickering, A. (1997). Predictors of the development of bulimia nervosa in women with anorexia nervosa. *Journal of Nervous and Mental Diseases, 185,* 704-707.

Button, E. J., & Whitehouse, A. (1981). Subclinical anorexia nervosa. *Psychological Medicine, 11,* 509-516.

Bruch, H. (1962). Perceptual and conceptual disturbances in anorexia nervosa. *Psychosomatic Medicine, 24,* 187-194.

Bruch, H. (1973). *Eating disorders: Obesity, anorexia, and the person within.* New York: Basic Books.

Bruch, H. (1978). *The golden cage: The enigma of anorexia nervosa.* Cambridge, MA: Harvard University Press.

Bruch, H. (1982). Anorexia nervosa: Therapy and theory. *American Journal of Psychiatry, 139,* 1531-1538.

Bruch, H. (1985). Four decades of eating disorders. In D. M. Garner & P. E. Garfinkel, (Eds.) *Handbook of psychotherapy for anorexia nervosa and bulimia.* New York: Guilford Press.

Bunnell, D. W., Shenker, I. R., Nussbaum, M. P., Jacobson, M. S., & Cooper, P. (1990). Subclinical versus formal eating disorders: Differentiating psychological features. *International Journal of Eating Disorders, 9,* 357-362.

Button, E. J., & Whitehouse, A. (1981). Subclinical anorexia nervosa. *Psychological Medicine, 11,* 509-516.

Cooper, Z., Cooper, P. J., & Fairburn, C. G. (1989). The validity of the Eating Disorder Examination and its subscales. *British Journal of Psychiatry, 154,* 807-812.

Cooper, Z., & Fairburn, C. (1987). The Eating Disorder Examination: A semi-structured interview on the assessment of the specific psychopathology of eating disorders. *International Journal of Eating Disorders, 6,* 1-8.

Cooper, P. J., Taylor, M. J., Cooper, Z,, & Fairburn, C. G. (1987). The development and validation of the Body Shape Questionnaire. *International Journal of Eating Disorders, 6,* 485-494.

Crago, M., Shisslak, C. M., & Estes, L. S. (1996). Eating disturbances among American minority groups: A review. *International Journal of Eating Disorders, 19,* 239-248.

Crisp, A. H. (1965). Clinical and therapeutic aspects of anorexia nervosa: A study of 30 cases. *Journal of Psychosomatic Research, 9,* 67-78.

Crisp, A. H. (1974). Primary anorexia nervosa or adolescent weight phobia. *The Practitioner, 212,* 525-535.

Crisp, A. H. (1980). *Anorexia nervosa: Let me be me.* New York: Grune and Stratton.

Crisp, A. H., & Fransella, F. (1972), Conceptual changes during recovery from anorexia nervosa. *British Journal of Medical Psychology, 45,* 395-405.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24,* 349-354.

DaCosta, M., & Halmi, K.A. (1992). Classifications of anorexia nervosa: Question of subtypes. *International Journal of Eating Disorders, 4,* 305-313.

Dancyger, I. F., & Garfinkel, P. E. (1995). The relationship of partial syndrome eating disorders to anorexia nervosa and bulimia nervosa. *Psychological Medicine, 25,* 1019-1025.

Davis, C., & Katzman, M. A. (1999). Chinese men and women in the United States and Hong Kong: Body and self-esteem ratings as a prelude to dieting and exercise. *International Journal of Eating Disorders, 23,* 99-102.

Derogatis, L. R. (1983). SCL-90-R: Administration, scoring, and procedures manual for the revised version. Towson, MD: Clinical Psychometric Research.

Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): A self-report symptom inventory. *Behavioural Science, 19,* 1-15.

Dickman, S. (1990). Functional and dysfunctional impulsivity: personality and cognitive correlates. *Journal of Personality and Social Psychology, 58,* 95-102.

Drewnowski, A., Yee, D. K., Kurth, C. L., & Krahn, D. D. (1994). Eating pathology and *DSM-III-R* bulimia nervosa: A continuum of behaviour. *American Journal of Psychiatry, 151,* 1217-1219.

Dykens, E. M., & Gerrard, M. (1986). Psychological profiles of purging bulimics, repeat dieters, and controls. *Journal of Consulting and Clinical Psychology, 54,* 283-288.

Eberenz, K. P., & Gleaves, D. H. (1994). An examination of the internal consistency and factor structure of the Eating Disorder Inventory-2 in a clinical sample. *International Journal of Eating Disorders, 16,* 371-379.

Fairburn, C. G. (1985). Cognitive-behavioural treatment for bulimia. In D. M. Garner & P. E. Garfinkel (Eds.), *Handbook of psychotherapy for anorexia nervosa and bulimia* (pp. 160-192). New York: Guilford Press.

Fairburn, C. G., & Beglin, S.J. (1990). Studies of the epidemiology of bulimia nervosa. *American Journal of Psychiatry, 147,* 401-408.

Fairburn, C. G., & Beglin, S.J. (1993). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16,* 363-370.

Feighner, J. P., Robius, E., Gize, S. B, Woodruff, R. A., Jr., Winokur, G., & Munoz, R. (1972). Diagnostic criteria for use in psychiatric research. *Archives of General Psychiatry, 26,* 57-63.

First, M. B., Spitzer, R. L., Gibbon, R. L., Gibbon, M., & Williams, J. B. W. (1984). *Structured Clinical Interview for Axis I DSM-IV Disorders Patient Edition (SCID-II, Version 2.0).* New York: Biometrics Research Department.

Fitts, W. H. (1964). *Tennessee Self-Concept Scale.* Nashville, TN: Counselor Recordings and Tests.

Fitzgibbon, M. A., Sánchez-Johnsen, L. A. P., & Martinovich, Z. (2003). A test of the continuity perspective across bulimic and binge eating pathology [Electronic version]. *International Journal of Eating Disorders, 34*(1), 83-97. Retrieved April 16, 2007, from http://www3.interscience.wiley.com/cgi-bin/fulltext/104533974/PDFSTART

Franko, D. L., & Omori, M. (1999). Subclinical eating disorders in adolescent women: A test of the continuity hypothesis and its psychological correlates. *Journal of Adolescence, 22*(3), 389-396.

Franko, D. L., & Zuroff, D. C. (1992). The Bulimic Automatic Thoughts Test: Initial reliability and validity data. *Journal of clinical Psychology, 48,* 505-509.

Gard, M. C. E., & Freeman, C. P. (1996). The dismantling of a myth: A review of eating disorders and socioeconomic status. *International Journal of Eating Disorders, 20,* 1-12.

Garfinkel, P. E., Lin, E., & Goering, P. (1996). Should amenorrhoea be necessary for the diagnosis of anorexia nervosa? Evidence from a Canadian community sample. *British Journal of Psychiatry, 168,* 500-506.

Garfinkel, P. E., Lin, E., Goering, P., Spegg, C., Goldbloom, M. D., Kennedy, M. D., Kaplan, A. S., & Woodside, D. B. (1995). Bulimia nervosa in a Canadian community sample: Prevalence and comparison of subgroups. *American Journal of Psychiatry, 152,* 1052 -1058.

Garfinkel, P. E., Lin, E., Goering, P., Spegg, C., Goldbloom, M. D., Kennedy, S., Kaplan, A.S., & Woodside, D.B. (1996). Should amenorrhoea be necessary for the diagnosis of anorexia nervosa? *British Journal of Psychiatry, 168,* 500-506.

Garner, D. M. (1991). *EDI-2: Eating Disorder Inventory-2 professional manual.* Odessa, FL: Psychological Assessment Resources, Inc.

Garner, D. M. (2004). *Eating Disorder Inventory-3: Professional manual.* Lutz, FL: Psychological Assessment Resources, Inc.

Garner, D. J., & Garfinkel, P. E. (1979). The Eating Attitudes Test: An index of the syndrome of anorexia nervosa. *Psychological Medicine, 9,* 273-279.

Garner, D. J., & Garfinkel, P. E. (1980). Socio-cultural factors in the development of anorexia nervosa. *Psychological Medicine, 10,* 647-656.

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *International Journal of Eating Disorders, 9,* 1-15.

Garner, D. M., Olmsted, M. P., & Garfinkel, P. E. (1983). Does anorexia nervosa occur on a continuum? *International Journal of Eating Disorders, 2,* 11-20.

Garner, D. M., Olmsted, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders, 2,* 15-34.

Garner, D. M., Olmsted, M. P., Polivy, J., & Garfinkel, P. E. (1984). Comparison between weight-preoccupied women and anorexia nervosa. *Psychosomatic Medicine, 46,* 255-265.

Garner, D. M., Rosen, L. W., & Barry, D. (1998). Eating disorders among athletes: Research and recommendations. *Child and Adolescent Psychiatric Clinics of North America, 7,* 839-857.

Geller, J., Cockell, S. J., Hewitt, P., Goldner, E. M., & Flett, G. (2000). Inhibited expression of negative emotions and interpersonal orientation in anorexia nervosa. *International Journal of Eating Disorders, 28,* 8-19.

Geller, J., Johnston, C., & Madsen, K. (1997). The role of shape and weight in self-concept: The Shape and Weight Based Self-Esteem Inventory. *Cognitive Therapy and Research, 21,* 5-24.

Gleaves, D. D., Brown, J. D., & Warren, C. S. (2004). The continuity/discontinuity models of eating disorders: A review of the literature and implications for assessment, treatment, and prevention. *Behaviour Modification, 28,* 739-762.

Gleaves, D. H., Lowe, M. R., Snow, A. C., Green, B. A, & Murphy-Eberenz, K.P. (2000). Continuity and discontinuity models of bulimia nervosa: A taxometric investigation. *Journal of Abnormal Psychology, 109,* 56-68.

Harris, R. J. (1985). *A primer of multivariate statistics* (2nd ed.). Orlando, FL: Academic Press.

Hathaway, S., & McKinley, J. (1966). *The Minnesota Multiphasic Personality Inventory.* New York: Psychological Corporation.

Hawkins, R. C., II, & Clement, P. F. (1980). Development and construct validation of a self-report measure of binge eating tendencies. *Addictive Behaviours, 5,* 219-226.

Hawkins, R.C., II, & Clement, P. F. (1984). Binge eating syndrome: The measurement problem and a conceptual model. In R. C. Hawkins, II, W. Fremouw, & P. F. Clement (Eds.), *Binge eating: Theory, research and treatment.* New York: Springer.

Herman, C. P., & Polivy, J. (1975). Anxiety, restraint, and eating behaviour. *Journal of Abnormal Psychology, 84,* 666-672.

Herman, C. P., & Polivy, J. (1980). Restrained eating. In A.J. Stunkard (Ed.), *Obesity.* Philadelphia: Saunders.

Herman, C. O., Polivy, J., Pliner, P., Threlkeld, J., & Munic, D. (1978). Distractibility in dieters and nondieters: An alternative view of "externality." *Journal of Personality and Social Psychology, 36,* 536-548.

Herzog, D. B., Hopkins, J. D., & Burns, C. D. (1993). A follow-up study of 33 subdiagnostic eating disordered women. *International Journal of Eating Disorders, 14,* 261-267.

Hock, H. W., Bartelds, A. I. M., Bosveld, J. J. F., van der Graaf, Y., Limpens, V. E. L., Maiwald, M., & Spaaij, C. J. K. (1995). Impact of urbanization on detection rates of eating disorders. *American Journal of Psychiatry, 152,* 1272-1278.

Hudson, J. I., Hiripi, E., Pope, H. G., Jr., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry, 61,* 348-358.

Hulley, A. J., & Hill, A. J. (2001). Eating disorders and health in elite women distance runners. *International Journal of Eating Disorders, 30,* 312-317.

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.

Jourard, S. M., & Secord, P. F. (1955). Body cathexis and the ideal female figure. *Journal of Abnormal and Social Psychology, 50,* 243-246.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39,* 31-36.

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.

Kruger, S., McVey, G., & Kennedy, S. (1998). The changing profile of anorexia nervosa at the Toronto programme for eating disorders. *Journal of Psychosomatic Research, 45,* 533-547.

Laessle, R. G., Tuschl, R. J., Waadt, S., & Pirke, K. M. (1989). The specific psychopathology of bulimia nervosa: A comparison with restrained and unrestrained (normal) eaters. *Journal of Consulting and Clinical Psychology, 57,* 772-775.

Levenson, R. W., & Gottman, J. M. (1978). Toward the assessment of social competence. *Journal of Consulting and Clinical Psychology, 46,* 453-462.

Lewinsohn, P. M., Striegel-Moore, R. H., & Seely, J. H. (2000). Epidemiology and natural course of eating disorders in young women from adolescence to young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 1284-1292.

Lindeman, M., Stark, K., & Keskivaara, P. (2001). Continuum and linearity hypotheses on the relationship between psychopathology and eating disorder symptomatology. *Eating and Weight Disorders, 6,* 181-187.

Lloyd, C., Overall, J. E., Kimsey, L. R., & Click, M. (1983). A comparison of the MMPI-168 profiles of borderline and nonborderline patients. *Journal of Nervous and Mental Diseases, 171,* 207-215.

Lowe, M. R. (1984, August 24-28). Restraint theory: The search for a mechanism. In M.E. Lowe, (Chair), *Relevance of restraint theory for normal and abnormal eating.* Paper presented at the 92nd Annual Convention of the American Psychological Association, Toronto, Ontario, Canada.

Lowe, M. R., Gleaves, D. H., DiSimone-Weiss, R. T., Furgueson, C., Gayda, C. A., Kolsky, P. A., Neal-Walden, T., Nelsen, L. A., & McKinney, S. (1996). Restraint, dieting, and the continuum model of bulimia nervosa. *Journal of Abnormal Psychology, 4,* 508-517.

Lucas, A. R., Beard, C. M., O'Fallon, W. M., & Kurland, L. T. (1991). 50-Year trends in the incidence of anorexia nervosa in Rochester, Minn.: A population-based study. *American Journal of Psychiatry, 148,* 917-922.

Lucas, A. R., Crowson, C. S., O'Fallon, W. M., & Melton, L. J. (1999). The ups and downs of anorexia nervosa. *International Journal of Eating Disorders, 26,* 397-405.

Manara, F., Manaro, A., & Todisco, P. (2005). Correlation between psychometric and biological parameters in anorexic and bulimic patients during and after an intensive day hospital treatment. *Eating and Weight Disorders, 10,* 236-244.

Mintz, L., & Betz, *N.* (1988). Prevalence and correlates of eating disordered behaviours among undergraduate women. *Journal of Counseling Psychology, 4,* 463-471.

Mintz, L. B., O'Halloran, M. S., Mulholland, A. M., & Schneider, P. A. (1997). Questionnaire for eating disorder diagnoses: Reliability and validity of operationalizing *DSM-IV* criteria into a self-report format. *Journal of Counseling Psychology, 44,* 63-79.

Minuchin, S., Rosman, B. L., & Baker, L. (1978). *Psychosomatic families: Anorexia nervosa in context.* Cambridge, MA: Harvard University Press.

Nielsen, S. (2001). Epidemiology and mortality of eating disorders. *Psychiatric Clinics of North America, 24,* 201-214.

Nylander, J. (1971). The feeling of being fat and dieting in a school population: Epidemiological interview investigation. *Acta Sociomedica Scandinavica, 3,* 17-26.

Offer, D., Ostrov, E., Howard, K. J., & Dolan, S. (1992). *Offer Self-Image Questionnaire: Revised.* Los Angeles: Western Psychological Services.

Ousley, L.B. (1986). *Differences among bulimic subgroups, binge-eaters, and normal dieters in a female college population.* Unpublished doctoral dissertation, University of Florida, Gainesville, FL.

Petrie, T. A. (1993). Disordered eating in female college gymnasts: Prevalence and personality/attitudinal correlates. *Journal of Sport & Exercise, 15,* 424-436.

Polivy, J., & Herman, C. P. (1987), Diagnosis and treatment of normal eating. *Journal of Consulting and Clinical Psychology, 55,* 635-644.

Polivy, J., Herman, C. P., & Warsh, S. (1978). Internal and external components of emotionality in restrained and unrestrained eaters. *Journal of Abnormal Psychology, 87,* 497-504.

Prather, R. C., & Williamson, D. A. (1988). Psychopathology associated with bulimia, binge eating, and obesity. *International Journal of Eating Disorders, 7,* 177-184.

Pryor, T., Wiederman, M. W., & McGilley, B. (1996). Clinical correlates of anorexia nervosa subtypes. *International Journal of Eating Disorders, 19,* 371-379.

Ringham, R., Klump, K., Kaye, W., Stone, D., Libman, S., Stowe, S., & Marcus, M. (2006). Eating disorder symptomatology among ballet dancers. *International Journal of Eating Disorders, 39,* 503-508.

Rosen, R., & Martindale, L. (1978). Sex role perceptions and the abortion decision. *Journal of Sex Research, 14,* 231-235.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton University Press.

Rosenberg, M. (1979). *Conceiving the self.* New York: Basic Books.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*(1), 1-28.

Rossiter, E. M., Wilson, G. T., & Goldstein, L. (1989). Bulimia nervosa and dietary restraint. *Behaviour Research and Therapy, 27,* 465-468.

Ruderman, A. J., & Besbeas, M. (1992). Psychological characteristics of dieters and bulimics. *Journal of Abnormal Psychology, 101,* 383-390.

Ruderman, A. J., & Grace, P. S. (1988). Bulimics and restrained eaters: A personality comparison. *Addictive Behaviours, 13,* 359-368.

Russell, G. F. (1979). Bulimia nervosa: An ominous variant of anorexia nervosa? *Psychological Medicine, 9,* 429-448.

Russell, G. F. M. (1997). The history of bulimia nervosa. In D. M. Garner & P. E. Garfinkel (Eds.), *Handbook of treatment for eating disorders* (pp. 50–63). New York: Guilford Press.

Sanford-Martens, T. C., Davidson, M. M., Yakushko, O. F., Martens, M. P., Hilton, P., & Beck, N. (2005). Clinical and subclinical eating disorders: An examination of college athletes. *Journal of Applied Sport Psychology, 17,* 79-86.

Schoemaker, C., van Strien, T., & van der Staak, C. (1994). Validation of the Eating Disorder Inventory in a nonclinical population using transformed and untransformed responses. *International Journal of Eating Disorders, 15,* 387-393.

Selvini-Palazzoli, M. P. (1978). *Self-starvation: From individual to family therapy in the treatment of anorexia nervosa.* New York: Jason Aronson.

Silverman, J. A. (1979). Anorexia nervosa: Historical perspective on treatment. In D.M. Garner & P. E. Garfinkel (Eds.), *Handbook of treatment for eating disorders.* New York: Guilford Press.

Smith, G. T., Hohlstein, L. A., & Atlas, J. G. (1992). Accuracy of self-reported weight: covariation with binger or restrainer status and eating disorder symptomatology. *Addictive Behaviours, 17,* 1-8.

Smith, M. C., & Thelen, M. H. (1984). Development and validation of a test for bulimia. *Journal of Consulting and Clinical Psychology, 52,* 863-872.

Smolack, L., Murnen, S. K., & Ruble, A. E. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders, 27,* 371-380.

Spielberger, C. D., Johnson, E. H., Russell, S. F., Crane, R. J., Jacobs, G. A., & Worder, T. J. (1985). Construct validation of an anger expression scale. In M. A. Chesney & R. H. Rosenman (Eds.), *Anger and hostility in cardiovascular and behavioural disorders.* New York: McGraw-Hill.

Spence, J., & Helmreich, R. (1978). *Masculity and femininity: Their psychological dimensions, correlates, and antecedents.* Austin, TX: University of Texas Press.

Sperberg, E. D., & Stabb, S. D. (1998). Depression in women as related to anger and mutuality in relationships. *Psychology of Women Quarterly, 22,* 223-238.

Spitzer, R. L., Devlin, M., Walsh, B. T., Hasin, D., Wing, R., Marcus, M., Stunkard, A., Wadden, T., Yanovski, S., Agras, S., Mitchell, J., & Nonas, C. (1992). Binge eating disorder: A multisite field trial of the diagnostic criteria. *International Journal of Eating Disorders, 11,* 191-203.

Spitzer, R. L., Williams, J. B., Gibbon, M., & First, M. B. (1987). *Instruction manual for SCID-II.* New York, NY: Biometrics Research Department New York State Psychiatric Institute.

Steiger, J., Leung, F. Y. K, Puentes-Neuman, G., & Gottheil, *N.* (1992). Psychosocial profiles of adolescent girls with varying degrees of eating and mood disturbances. *International Journal of Eating Disorders, 11,* 121-131.

Steiger, H., Leung, F. Y. K., Ross, D. J., & Gulko, J. (1992). Signs of anorexia and bulimia nervosa in high school girls reporting combinations of eating and mood symptoms: Relevance of self-report to interview-based findings. *International Journal of Eating Disorders, 12,* 143-149.

Steiger, H., & Seguin, J. R. (1999). Anorexia nervosa and bulimia nervosa. In T. Millon, P. H. Blaney, & R. D. Davis (Eds.), *Oxford textbook of psychopathology.* New York: Oxford University Press.

Stice, E., Killen, J. D., Hayward, C., & Barr Taylor, C. (1998). Support for the continuity hypothesis of bulimic pathology. *Journal of Consulting and Clinical Psychology, 66,* 784-790.

Stice, E., & Shaw, H. (1998). Dual pathway model of bulimia nervosa: Longitudinal support for dietary restraint and affect-regulation mechanisms. *Journal of Social and Clinical Psychology, 17,* 129-149.

Stice, E., Ziemba, C., Margolis, J., & Flick, P. (1996). The Dual Pathway Model differentiates bulimics, subclinical bulimics, and controls: Testing the continuity hypothesis. *Behaviour Therapy, 27,* 531-549.

Stunkard, A. J., & Messik, S. (1985). The Three Factor Eating Questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research, 29,* 71-81.

Sundgot-Borgen, J. (1994). Risk and trigger factors for the development of eating disorders in female elite athletes. *Medicine and Science in Sports and Exercise, 26,* 414-419.

Thelen, M. H., Farmer, J., Wonderlich, S., & Smith, M. (1991). A revision of the bulimia Test: The BULIT-R. *Psychological Assessment, 3,* 119-124.

Thompson, D. A., Berg, K. M., & Shatford, M. A. (1987). The heterogeneity of bulimic symptomatology: Cognitive and behavioural dimensions. *International Journal of Eating Disorders, 6,* 215-234.

Thompson, J. (1995). Silencing the self: Depressive symptomatology and close relationships. *Psychology of Women Quarterly, 19,* 337-353.

Thompson, M. G., & Schwartz, D. M. (1982). Life adjustment of women with anorexia nervosa and anorexic-like behaviour. *International Journal of Eating Disorders, 1,* 47-60.

Troisi, A., Di Lorenzo, G., Alcini, S., Nanni, R., Di Pasquale, C., & Siracusano, A. (2006). Body dissatisfaction in women with eating disorders: Relationship to early separation anxiety and insecure attachment. *Psychosomatic Medicine, 68,* 449-453.

Turnbull, S., Ward, A., Treasure, J., Jick, H., & Derby, L. (1996). The demand for eating disorder care. An epidemiological study using the general practice research database. *British Journal of Psychiatry, 169,* 705-712.

Tylka, T. L., & Subich, L. M. (1999). Exploring the construct validity of the eating disorder continuum. *Journal of Counseling Psychology, 46,* 268-276.

Vandereycken, W. (1995). Families of patients with eating disorders. In C. G. Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity.* New York: Guilford Press.

Vandereycken, W., & Pierloot, R. (1983). The significance of sub classification in anorexia nervosa: A comparative study of clinical features in 141 patients. *Psychological Medicine, 13,* 543-549.

Vanderheyden, D. A., & Boland, F. J. (1987). A comparison of normals, mild, moderate, and severe binge eaters, and binge vomiters using discriminant function analysis. *International Journal of Eating Disorders, 6,* 331 -337.

Van Hoeken, D., Seidell, J., & Hoek, H. W. (2005). Epidemiology. In J. Treasure, U. Schmidt, & E. van Furth (Eds.), *The essential handbook of eating disorders.* Hoboken, NJ: John Wiley & Sons Inc.

Van Strien, T., & Ouwens, M. (2003). Validation of the Dutch EDI-2 in one clinical and two nonclinical populations. *European Journal of Psychological Assessment, 19,* 66-84.

Vitousek, K., & Manke, F. (1994). Personality variables and disorders in anorexia nervosa and bulimia nervosa. *Journal of Abnormal Psychology, 103*(1), 137-147.

Weissman, M. M., & Paykel, E. S. (1974). *The depressed woman: A study of social relationships.* Chicago: University of Chicago Press.

Whitaker, A., Davies, M., Shaffer, D., Johnson, J., Abrams, S., Walsh, B. T., & Kalikow, K. (1989). The struggle to be thin: A survey of anorexic and bulimic symptoms in a non-referred adolescent population. *Psychological Medicine, 19,* 143-163.

Williamson, D. A., Barker, S. E., & Norris, L. E. (1993). Etiology and management of eating disorders. In P. B. Sutker & H. E. Adams (Eds.), *Comprehensive handbook of psychopathology* (2nd ed.). New York: Plenum Press.

Willmuth, M. E., Leitenberg, H., & Rosen, J. C. (1988). A comparison of purging and nonpurging normal weight bulimics. *International Journal of Eating Disorders, 7,* 825-835.

Woodside, D. B., Garfinkel, P. E., Lin, E., Goering, P., Kaplan, A. S., Goldbloom, D. S., & Kennedy, S. H. (2001). Comparisons of men with full or partial eating disorders, men without eating disorders, and women with eating disorders in the community. *American Journal of Psychiatry, 158,* 570-574.

World Health Organization. (1992). *The ICD-10 Classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines.* Geneva, Switzerland: Author.

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.

APPENDICES

APPENDIX A.

PARENTAL CONSENT FORM

Your child's school has agreed to participate in a study designed to help us learn more about how adolescents view themselves, their worlds, and their eating patterns. Your child will be given the opportunity to participate in this study, provided you consent to their participation. Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of participants. This form and the information it contains are given to you for your child's protection and for your full understanding of the procedures involved.

Participation in this study involves your child completing a brief information sheet and four separate questionnaires which are designed to assess the various thoughts, feelings, and attitudes adolescents have about themselves, their lives, and their eating patterns. There are no foreseeable risks to those taking part in this study, and all information collected during the study will remain confidential as your child's responses will be completely anonymous. In addition, your child's participation is completely voluntary, and they will be informed that they can withdraw their participation at any time should they so desire. ***We are confident that your child's experience of participating in this research project will be a positive one!*** The study is scheduled to take place during two regularly-scheduled class times, and will occur in late November or early December, 1995.

To help us ensure parental or guardian feedback, we are asking that you complete the bottom portion of this form ONLY IF you DO NOT wish to permit your child's participation in this project. Should this be the case, and you do not want your child to participate in the study, please return or have your child return the completed bottom section of this form to their school as soon as possible. Your assistance is greatly appreciated. Should we fail to receive your completed form, we will conclude that you are providing your consent for your child to participate in the study. Once again, your child's participation, even one your consent is obtained, is completely voluntary. In order to ensure that this is the case, immediately prior to the study your child will be asked to sign a consent form indicating that they themselves wish to participate in the study.

Any questions or concerns about the study may be brought to the chief researcher, Lana Hawkins, or to Dr. Christopher Webster, the Chair of Simon Fraser University's Psychology Department, both of whom may be reached at 291-3354. You and your child may obtain a copy of the results of this study, upon its completion, by contacting Lana Hawkins at the above telephone number.

IF YOU <u>DO NOT</u> AGREE TO YOUR CHILD'S PARTICIPATION IN THE STUDY, please fill out the following section, along with your signature.

I, as parent or legal guardian of _____

(your child's full name)

DO NOT CONSENT (do not agree) to their participation in the research study to take place at their school during regularly-scheduled class time.

Your Name _____

Address _____

Signature _____

Date _____

Reminder: Those parents who wish to allow their children to participate should not complete this form.

APPENDIX B.

INFORMATION SHEET FOR PARENT OR GUARDIAN

Your child's school has agreed to participate in a study designed to help us learn more about how adolescents view themselves, their worlds, and their eating patterns. Your child will be given the opportunity to participate in this study, provided you consent to their participation. Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of participants. This form and the information it contains are given to you for your child's protection and for your full understanding of the procedures involved.

Participation in this study involves your child completing a brief information sheet and four separate questionnaires which are designed to assess the various thoughts, feelings, and attitudes adolescents have about themselves, their lives, and their eating patterns. There are no foreseeable risks to those taking part in this study, and all information collected during the study will remain confidential as your child's responses will be completely anonymous. In addition, your child's participation is completely voluntary, and they will be informed that they can withdraw their participation at any time should they so desire. ***We are confident that your child's experience of participating in this research project will be a positive one!*** The study is scheduled to take place during two regularly-scheduled class times, and will occur in late November or early December, 1995.

To help us ensure parental or guardian feedback, we are asking that you complete the bottom portion of this form ONLY IF you DO NOT wish to permit your child's participation in this project. Should this be the case, and you do not want your child to participate in the study, please return or have your child return the completed bottom section of this form to their school as soon as possible. Your assistance is greatly appreciated. Should we fail to receive your completed form, we will conclude that you are providing your consent for your child to participate in the study. Once again, your child's participation, even one *your* consent is obtained, is completely voluntary. In order to ensure that this is the case, immediately prior to the study your child will be asked to sign a consent form indicating that they themselves wish to participate in the study.

Any questions or concerns about the study may be brought to the chief researcher, Lana Hawkins, or to Dr. Christopher Webster, the Chair of Simon Fraser University's Psychology Department, both of whom may be reached at 291-3354. You and your child may obtain a copy of the results of this study, upon its completion, by contacting Lana Hawkins at the above telephone number.

Parent/Guardian's Initials_____ Researcher's Initials _____

As the primary research in this project, I, Lana Hawkins, would like to thank all of you who chose to allow your child to participate in the study. I would like to briefly explain the nature of the study, and what it is we are hoping to discover. First, it is clear that eating disturbances, body dissatisfaction, and eating disorders have become an important problem in today's world. For the past several years, many researchers have attempted to define what might predispose some individuals to who diet to develop anorexia nervosa or bulimia. Over time, two very different theories have emerged. One theory, called the "continuum hypothesis," states that both the disturbances in eating and the psychological disturbances associated with anorexia and/or bulimia (e.g., low self-esteem, Perfectionism) exist on a continuum from non-problematic to problematic, and that anyone who diets is at risk for anorexia or bulimia. The other theory (the "discontinuity theory") proposes that there are distinct psychological characteristics which predispose some people who begin dieting to go on to develop eating disorders, and if one does not possess this "at risk" psychological profile, then they will just remain "normal dieters." The study your child is participating in represents an attempt to provide a clearer answer to this question, as inconsistent results have been found in the past. Thank you for assisting us with this important project!

APPENDIX C.

INFORMED CONSENT FORM FOR SUBJECTS

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your own protection and full understanding of the procedures involved. Your signature on the Informed Consent forms signifies that you have been informed of the procedures and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to participate in the project.

Having been asked by Lana Hawkins of the Department of Psychology of Simon Fraser University to participate in a research project experiment titled *"subclinical Eating Disorders and the Eating Disorder Continuum: Is the continuum continuous?"* I have read the procedures specified in this document. I understand the procedure to be used in this experiment involves completing a brief information sheet and two separate questionnaires, and the time required to complete the package of questionnaires will be approximately one hour. I agree to participate by completing the information sheet and the questionnaires which are designed to assess my eating patterns, as well as the thoughts, feelings, and attitudes I have towards eating and towards myself and my life. I understand that there are no foreseeable personal risks to me in taking part. There are no direct benefits to my participating in the study, other than the knowledge that I am helping the researcher learn more about psychological factors central to eating disorders, and their role in the development of anorexia and bulimia.

I also understand that I may register any complaint I might have about the experiment with Dr. Daniel Weeks, Chair of Psychology at Simon Fraser University, who may be reached through the Department of Psychology at (604) 291-3354. I may obtain copies of the results of this study upon its completion by contacting Lana Hawkins at the above telephone number.

I have been informed that all information collected during the study will remain confidential. My name will not be written on any of the research material, and therefore my responses will be completely anonymous. I understand that my participation is voluntary, and that I am free to refuse to answer a question, and free to withdraw from the study at any time. I understand that the information I provide will be kept for at least five years after the study is done. The information will be kept in a secure area (i.e., locked filing cabinet). As my responses are anonymous, my name will never be stated in any presentations or publications of the study results.

Name (please print) _____

Address _____

_____

Signature _____

Date: _____ Witness:_____

APPENDIX D.

CONSENT FORM FOR PARENT OR GUARDIAN

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your child's protection and full understanding of the procedures involved. Your signature on this Consent Form signifies that you have been informed of the procedures and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to allow your child to participate in the project.

Having been asked by Lana Hawkins of the Department of Psychology of Simon Fraser University to consent to my child's participation in a research project experiment titled *"subclinical Eating Disorders and the Eating Disorder Continuum: Is the continuum continuous?"* have read the procedures specified in this document. I understand the procedure to be used in this experiment involves completing a brief information sheet and two separate questionnaires designed to assess eating patterns, as well as the thoughts, feelings, and attitudes my child has towards eating and towards herself and her life. I understand that there are no foreseeable personal risks to my child taking part in this project. There are no direct benefits to participating in the study, other than the knowledge that we are helping the researcher learn more about psychological factors central to eating disorders, and how they play a role in the development of anorexia and bulimia.

I also understand that I may register any complaint I might have about the experiment with Dr. Daniel Weeks, Chair of Psychology at Simon Fraser University, who may be reached through the Department of Psychology at (604) 291-3354. I may obtain copies of the results of this study upon its completion by contacting Lana Hawkins at the above telephone number.

I have been informed that all information collected during the study will remain confidential. My child's name will not be written on any of the research material, and therefore her responses will be completely anonymous. I understand that her participation is voluntary, and that she is free to refuse to answer a question, and free to withdraw from the study at any time. I understand that the information she provides will be kept for at least five years after the study is done. The information will be kept in a secure area (i.e., locked filing cabinet). As her responses are anonymous, her name will never be stated in any presentations or publications of the study results.

Name (please print)_____

Child's name_____

Address _____

_____

Signature _____

Date: _____ Witness _____

Once signed, a copy of the information contained in this consent form will be provided to you.

APPENDIX E.

SUBJECT INFORMATION SHEET

Date of birth: _____ _____ _____ Age: ____ Height:____ft ____in
Month day year Sex:____ (M or F) School:_____

Race or ethnicity (please specify): _____

Country of your birth: _____

Country of your parents' birth_____

Current Family Situation: _____two-parent family _____step-family
_____one-parent family _____other

Mother's highest level of education completed:

_____ Grade (please circle) 1 2 3 4 5 6 7 8 9 10 11 12
_____ Trade or technical school
_____ Community college
_____ University

Mother's occupation:_____

Father's highest level of education completed:

_____ Grade (please circle) 1 2 3 4 5 6 7 8 9 10 11 12
_____ Trade or technical school
_____ Community college
_____ University

Father's occupation:_____

How often do you typically engage in the following activities for longer than a 20-minute period? (please mark with an "X" for each activity.

	Never or rarely	1-3 times a month	At least once a week	Nearly every day
Jogging	_____	_____	_____	_____
Walking	_____	_____	_____	_____
Running	_____	_____	_____	_____
Sit-ups	_____	_____	_____	_____
Stretching	_____	_____	_____	_____
Weight-lifting	_____	_____	_____	_____
Baseball	_____	_____	_____	_____
Biking	_____	_____	_____	_____
Canoeing	_____	_____	_____	_____
Golf	_____	_____	_____	_____
Hockey	_____	_____	_____	_____

Please turn over...

	Never or rarely	1-3 times a month	At least once a week	Nearly every day
Sailing	_____	_____	_____	_____
Skating	_____	_____	_____	_____
Skiing	_____	_____	_____	_____
Soccer	_____	_____	_____	_____
Rugby	_____	_____	_____	_____
Wrestling	_____	_____	_____	_____
Martial arts	_____	_____	_____	_____
Swimming	_____	_____	_____	_____
Racquetball	_____	_____	_____	_____
Squash	_____	_____	_____	_____
Tennis	_____	_____	_____	_____
Aerobics	_____	_____	_____	_____
Bowling	_____	_____	_____	_____
Dance	_____	_____	_____	_____
Gymnastics	_____	_____	_____	_____
Softball	_____	_____	_____	_____

Please list all of the reasons, in order of importance (with the most important reason being listed first, the second most important reason listed second, and so on) that you engage in exercise.

1._____
2._____
3._____

Other reasons:_____

_____

Have you ever taken steroid pills or had steroid injections in order to enhance either your athletic performance or your body shape? _____yes

_____no

What is "anorexia" (sometimes also called "anorexia nervosa")

_____

_____

_____

What is "bulimia" (sometimes also called "bulimia nervosa")

_____

_____

What is the postal code for your home address? _ _ _ – _ _ _ (e.g., V5A 1S5)

APPENDIX F.

INFORMED CONSENT FOR SUBJECTS

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your own protection and full understanding of the procedures involved. Your signature on the Subject Consent Form signifies that you have been informed of the procedures and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to participate in the project.

Having been asked by Lana Hawkins of the Department of Psychology of Simon Fraser University to participate in a research project experiment titled *"subclinical Eating Disorders and the Eating Disorder Continuum: Is the continuum continuous?,"* I have read the procedures specified in this document.

I understand the procedure to be used in this experiment involves completing a brief information sheet and four separate self-report questionnaires. I agree to participate by completing the information sheet and the questionnaires which are designed to assess my eating patterns, as well as the thoughts, feelings, and attitudes I have towards eating and towards myself and my life. I understand that there are no foreseeable personal risks to me in taking part. There are no direct benefits to my participating in the study, other than the knowledge that I am helping the researcher learn more about the perceptions young people have about themselves, their eating, and their lives.

I also understand that I may register any complaint I might have about the experiment with either Lana Hawkins or with Dr. Christopher Webster, Chair of Psychology at Simon Fraser University, who may be reached through the Department of Psychology at (604) 291-3354. I may obtain copies of the results of this study upon its completion by contacting Lana Hawkins at the above telephone number.

I have been informed that all information collected during the study will remain confidential. My name will not be written on any of the research material, and therefore my responses will be completely anonymous. I understand that my participation is voluntary, and that I am free to withdraw from the study at any time.

Name (please print)_____

Child's name_____

Address _____

_____

School _____

Signature _____

Date: _____ Witness _____

At the end of the study, a copy of the information provided in this consent form, along with some additional information about the study, will be provided to you.

APPENDIX G.

INFORMATION SHEET FOR SUBJECTS

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your own protection and full understanding of the procedures involved. Your signature on the Subject Consent Form signifies that you have been informed of the procedures and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to participate in the project.

Having been asked by Lana Hawkins of the Department of Psychology of Simon Fraser University to participate in a research project experiment titled *"subclinical Eating Disorders and the Eating Disorder Continuum: Is the continuum continuous?,"* I have read the procedures specified in this document.

I understand the procedure to be used in this experiment involves completing a brief information sheet and four separate self-report questionnaires. I agree to participate by completing the information sheet and the questionnaires which are designed to assess my eating patterns, as well as the thoughts, feelings, and attitudes I have towards eating and towards myself and my life. I understand that there are no foreseeable personal risks to me in taking part. There are no direct benefits to my participating in the study, other than the knowledge that I am helping the researcher learn more about the perceptions young people have about themselves, their eating, and their lives.

I also understand that I may register any complaint I might have about the experiment with either Lana Hawkins or with Dr. Christopher Webster, Chair of Psychology at Simon Fraser University, who may be reached through the Department of Psychology at (604) 291-3354. I may obtain copies of the results of this study upon its completion by contacting Lana Hawkins at the above telephone number.

I have been informed that all information collected during the study will remain confidential. My name will not be written on any of the research material, and therefore my responses will be completely anonymous. I understand that my participation is voluntary, and that I am free to withdraw from the study at any time.

Subject's Initials_____ Researcher's Initials _____

As the primary research in this project, I, Lana Hawkins, would like to thank all of you who chose to participate in the study today. I would like to briefly explain the nature of the study, and what it is we are hoping to discover. First, it is clear that eating disturbances, body dissatisfaction, and eating disorders have become an important problem in today's world. For the past several years, many researchers have attempted to define what might predispose some individuals to who diet to develop anorexia nervosa or bulimia. Over time, two very different theories have emerged. One theory, called the "continuum hypothesis," states that both the disturbances in eating and the psychological disturbances associated with anorexia and/or bulimia (e.g., low self-esteem, Perfectionism) exist on a continuum from non-problematic to problematic, and that anyone who diets is at risk for anorexia or bulimia. The other theory (the "discontinuity theory") proposes that there are distinct psychological characteristics which predispose some people who begin dieting to go on to develop eating disorders, and if one does not possess this "at risk" psychological profile, then they will just remain "normal dieters." The study you are participating in represents an attempt to provide a clearer answer to this question, as inconsistent results have been found in the past. Thank you for assisting us with this important project!

Note: should you wish further information regarding eating problems and eating disorders, or if you feel you might have a problem with your eating, you may find the following resources helpful: Richmond Mental Health (604-273-9121), Maple Ridge Mental Health (604-476-7165), the British Columbia chapter of Anorexia Nervosa and Associated Disorders (ANAD; 604-739-2070), the British Columbia Dietitians' and Nutritionists' Association (604-736-3790), and the Eating Disorder Resource Centre of British Columbia (604-806-9000).

APPENDIX H.

SUBJECT FEEDBACK FORM

Completion of this form is **OPTIONAL**, and is not a requirement of participation in the project. However, if you have served as a subject in a project and would care to comment on the procedures involved, you may complete the following form and send it to the Chair, University Research Ethics Review Committee. All information received will be treated in a strictly confidential manner.

Name of Principal Investigator: Lana Hawkins

Title of Project: subclinical Eating Disorders and the Eating Disorders Continuum: Is the continuum continuous?

Department: Department of Psychology

Did you sign an Informed Consent Form before participating in the project? _____

Were there significant deviations from the originally stated procedures? _____

I wish to comment on my involvement in the above project which took place at

_____

(Date) (Place) (Time)

Comments:

Completion of this section is optional

Your name: _____

Address: _____

Telephone: (w)_____ (h)_____

This form should be sent to the Chair, University Ethics Review Committee, c/o Office of the Vice-President, Research, Simon Fraser University, Burnaby, BC, V5A 1S6.

APPENDIX I.

INFORMATION SHEET FOR SUBJECTS

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your own protection and full understanding of the procedures involved. Your signature on the Informed Consent forms signifies that you have been informed of the procedures and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to participate in the project.

Having been asked by Lana Hawkins of the Department of Psychology of Simon Fraser University to participate in a research project experiment titled *"subclinical Eating Disorders and the Eating Disorder Continuum: Is the continuum continuous?"* I have read the procedures specified in this document. I understand the procedure to be used in this experiment involves completing a brief information sheet and two separate questionnaires, and the time required to complete the package of questionnaires will be approximately one hour. I agree to participate by completing the information sheet and the questionnaires which are designed to assess my eating patterns, as well as the thoughts, feelings, and attitudes I have towards eating and towards myself and my life. I understand that there are no foreseeable personal risks to me in taking part. There are no direct benefits to my participating in the study, other than the knowledge that I am helping the researcher learn more about psychological factors central to eating disorders, and their role in the development of anorexia and bulimia.

I also understand that I may register any complaint I might have about the experiment with Dr. Daniel Weeks, Chair of Psychology at Simon Fraser University, who may be reached through the Department of Psychology at (604) 291-3354. I may obtain copies of the results of this study upon its completion by contacting Lana Hawkins at the above telephone number.

I have been informed that all information collected during the study will remain confidential. My name will not be written on any of the research material, and therefore my responses will be completely anonymous. I understand that my participation is voluntary, and that I am free to refuse to answer a question, and free to withdraw from the study at any time. I understand that the information I provide will be kept for at least five years after the study is done. The information will be kept in a secure area (i.e., locked filing cabinet). As my responses are anonymous, my name will never be stated in any presentations or publications of the study results.

Subject's Initials_____ Researcher's Initials _____

As the primary research in this project, I, Lana Hawkins, would like to thank all of you who chose to participate in the study today. I would like to briefly explain the nature of the study, and what it is we are hoping to discover. First, it is clear that eating disturbances, body dissatisfaction, and eating disorders have become an important problem in today's world. For the past several years, many researchers have attempted to define what might predispose some individuals to who diet to develop anorexia nervosa or bulimia. Over time, two very different theories have emerged. One theory, called the "continuum hypothesis," states that both the disturbances in eating and the psychological disturbances associated with anorexia and/or bulimia (e.g., low self-esteem, Perfectionism) exist on a continuum from non-problematic to problematic, and that anyone who diets is at risk for anorexia or bulimia. The other theory (the "discontinuity theory") proposes that there are distinct psychological characteristics which predispose some people who begin dieting to go on to develop eating disorders, and if one does not possess this "at risk" psychological profile, then they will just remain "normal dieters." The study you are participating in represents an attempt to provide a clearer answer to this question, as inconsistent results have been found in the past. In addition to the information you are providing, information has been gathered from over 400 junior high and high school girls, and comparing your responses to theirs will help us to address our central question (of the continuity/discontinuity of eating disorders) in a more thorough manner. Thank you for assisting us with this important project!

APPENDIX J.

INFORMATION SHEET FOR PARENT OR GUARDIAN

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your child's protection and full understanding of the procedures involved. Your signature on this Consent Form signifies that you have been informed of the procedures and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to allow your child to participate in the project.

Having been asked by Lana Hawkins of the Department of Psychology of Simon Fraser University to consent to my child's participation in a research project experiment titled *"subclinical Eating Disorders and the Eating Disorder Continuum: Is the continuum continuous?"* have read the procedures specified in this document. I understand the procedure to be used in this experiment involves completing a brief information sheet and two separate questionnaires designed to assess eating patterns, as well as the thoughts, feelings, and attitudes my child has towards eating and towards herself and her life. I understand that there are no foreseeable personal risks to my child taking part in this project. There are no direct benefits to participating in the study, other than the knowledge that we are helping the researcher learn more about psychological factors central to eating disorders, and how they play a role in the development of anorexia and bulimia.

I also understand that I may register any complaint I might have about the experiment with Dr. Daniel Weeks, Chair of Psychology at Simon Fraser University, who may be reached through the Department of Psychology at (604) 291-3354. I may obtain copies of the results of this study upon its completion by contacting Lana Hawkins at the above telephone number.

I have been informed that all information collected during the study will remain confidential. My child's name will not be written on any of the research material, and therefore her responses will be completely anonymous. I understand that her participation is voluntary, and that she is free to refuse to answer a question, and free to withdraw from the study at any time. I understand that the information she provides will be kept for at least five years after the study is done. The information will be kept in a secure area (i.e., locked filing cabinet). As her responses are anonymous, her name will never be stated in any presentations or publications of the study results.

Parent/Guardian's Initials_____ Researcher's Initials _____

As the primary research in this project, I, Lana Hawkins, would like to thank all of you who chose to allow your child to participate in the study. I would like to briefly explain the nature of the study, and what it is we are hoping to discover. First, it is clear that eating disturbances, body dissatisfaction, and eating disorders have become an important problem in today's world. For the past several years, many researchers have attempted to define what might predispose some individuals to who diet to develop anorexia nervosa or bulimia. Over time, two very different theories have emerged. One theory, called the "continuum hypothesis," states that both the disturbances in eating and the psychological disturbances associated with anorexia and/or bulimia (e.g., low self-esteem, Perfectionism) exist on a continuum from non-problematic to problematic, and that anyone who diets is at risk for anorexia or bulimia. The other theory (the "discontinuity theory") proposes that there are distinct psychological characteristics which predispose some people who begin dieting to go on to develop eating disorders, and if one does not possess this "at risk" psychological profile, then they will just remain "normal dieters." The study your child is participating in represents an attempt to provide a clearer answer to this question, as inconsistent results have been found in the past. In addition to the information your child is providing, information has been gathered from over 400 junior high and high school girls, and comparing the responses will help us to address our central question (of the continuity/discontinuity of eating disorders) in a more thorough manner. Thank you for assisting us with this important project!