Identifying Young Girls At Risk For Eating Disorders: A Multi-faceted Self-inadequacy Risk Model

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ABSTRACT

Identifying Young Girls At Risk For Eating Disorders:
A Multi-faceted Self-inadequacy Risk Model

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Low self-esteem, fear of negative evaluation, and body dissatisfaction have long been implicated in the development of eating disorders. The present study examined these attributes of the self as a multi-faceted self-inadequacy risk model for eating disorders. It was hypothesized that girls who display a self-profile characterized by extremely low self-esteem, high fear of negative evaluation and body dissatisfaction will report more of the eating, psychiatric and family problems found in eating disordered patients than girls who do not. To assess the validity and utility of this risk model, 918 adolescent girls and 74 eating-disordered female patients completed measures of family characteristics, attributes of the self, and eating and other psychiatric symptomatology. Results provided empirical support for the construct validity of the self-inadequacy risk model. The findings derived from two separate modes of risk group classification converged to indicate that the constellation of attributes of self-inadequacy used in the study defines a distinct vulnerable self-profile, which in its extreme form, predisposes young girls to eating pathology. The results also revealed that

the self-inadequacy construct consists of two interrelated components: a body-image deficit and a general self-image deficit. Different combinations of the two components of self-inadequacy were associated with particular family and symptom profiles. Structural equation analyses illustrated how two sources of family influence contribute to the development of serious eating pathology. The first source was family preoccupation with weight leading to body dissatisfaction; the second source was general family dysfunction leading to self-esteem problems. The findings indicate that the interaction of the two sources of family influence leads to a pervasive sense of self-inadequacy, and a symptom profile characterized by both serious eating disturbances and other psychiatric symptoms. Results are discussed in terms of the potential usefulness of the identified construct for assessing risk for eating disorders among young girls, and the possible mechanisms by which the two sources of family influence and the two component of self-inadequacy lead to clinical eating pathology. Future research directions in this area are considered.

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DEDICATION

To You, Mom.

Sorry for being late.

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Introduction

The eating disorders (EDs), anorexia nervosa (AN) and bulimia nervosa (BN), are serious health threats for women of contemporary western societies (Garfinkel, Garner & Goldbloom, 1987; Mitchell & Eckert, 1987). The diagnostic criteria for AN according to DSM-III-R (APA, 1987) include: a refusal to maintain body weight over a minimal normal weight for age and height (i.e., weight 15% below the appropriate standard), an intense anxiety about gaining weight or becoming fat even though underweight, and a disturbance of body experience (e.g., feeling fat even when emaciated). Among females, amenorrhea is an additional criterion (for at least three consecutive menstrual cycles when otherwise expected to occur). The diagnostic criteria for BN include: recurrent episodes of binge eating (averaging at least two binge episodes per week for three months), an experience of a lack of control over eating behavior during the binges, the regular occurrence of purgative behavior (by self-induced vomiting, use of laxatives or diuretics, strict eating restraint, or vigorous physical exercise) to avoid weight gain, and the persistent overconcern with body shape and weight.

Although the DSM-III-R classifies these syndromes as two distinct diagnostic categories, it is important to note that the two disorders are closely related. First, many anorexic patients display concurrent BN (Garner, 1986), and

many bulimic patients also suffered previously from AN (Russell, 1979; Yager, Landsverk, & Edelstein, 1987). Moreover, the same patients may move between the syndromes of AN and BN at different times (Vandereycken & Pierloot, 1983; Yager et al., 1987). Second, clinical features such as attitudes toward food and weight and psychological attributes such as a pervasive sense of self-inadequacy appear similar among both anorexics and bulimics (Bruch, 1985; Fairburn & Cooper, 1984; Garner, Garfinkel, & O'Shaughnessy, 1985; Norman & Herzog, 1983). The intimate links between these two syndromes explain why researchers often refer to both simply as EDs (Garner & Fairburn, 1988; Levine, 1987).

According to epidemiological data, 90%-95% of ED patients are females (Crisp, 1988; Hsu, 1989). The prevalence of AN is about 0.5%-1.5% among adolescent girls and young women (Cullberg & Engstrom-Lindberg, 1988; Robins et al., 1984; Whitaker et al., 1990). The prevalence of BN is difficult to estimate because different studies have used different definitions and different sampling methods. Based on a review of the literature, Connors and Johnson (1987) concluded that the prevalence of BN according to DSM-III criteria is most likely between 4% to 8% of females in their late teens or early twenties. The prevalence of subclinical cases (individuals who display some symptoms of AN or BN but who otherwise fail to meet the diagnostic criteria for a

true ED) among young females is estimated to be even higher, probably up to about 15 to 20% (Conners & Johnson, 1987; Fairburn & Beglin, 1990). The peak period of onset of EDs occurs in the teens and early twenties (Crisp, 1988; Garfinkel & Garner, 1982; Hsu, 1990), and chronic forms of these disorders develop in many of the sufferers (Garfinkel et al., 1987; Johnson, Stuckey, Lewis, & Schwartz, 1982; Toner, Garfinkel & Garner, 1986). Both AN and BN are also associated with serious psychological impairments (Crisp, 1984; Herzog, Pepose, Norman, Rigotti, 1985; Prather & Williamson, 1988) and potentially serious medical complications (Bo-Linn, 1986; Hall, Hoffman, Beresford, & Wooley, 1989; Kaplan & Woodside, 1987; Theander, 1985). It is generally agreed that prevention and early intervention of these disorders are necessary (Crisp, 1988; Shisslak, Crago, Neal, & Swain, 1987; Smead, 1985).

IDENTIFYING WOMEN AT RISK FOR EDs

To make prevention and early intervention possible, however, we must first be able to identify those who are at-risk. The high risk (HR) methodology, which focuses on who is at risk, why, and what can be done about it (Gruenberg, 1981), has received universal endorsement from investigators (Garfinkel et al., 1987; Hsu, 1989; Mitchell & Eckert, 1987; Patton & King, 1991; Shaw & Garfinkel, 1990; Yates, 1990) as the wave of future research on EDs. This methodology has been recommended for two major reasons. First, in contrast

to retrospective studies, which use childhood records or are based on recollections of patients or parents, the data in a well-designed high risk study are uniformly and systematically obtained and therefore ensure greater accuracy. Second, because high risk subjects are usually children or adolescents, any manifest characteristics observed in these individuals are only minimally colored by the secondary effects of the disorder. Elucidating the premorbid characteristics of anorexics and bulimics will enhance our understanding of the etiology of EDs.

High risk methodology, however, is not without its problems. Given the lengthy time span that ensues between initial assessment and later manifest symptoms of disorder, high risk research is by nature an "uncertain" venture. There is no guarantee that there will be a significant research pay-off at the end of the lengthy follow-up period. This reality highlights the importance of sample selection criteria in high risk research. Different criteria may be used in identifying individuals at risk for EDs. These criteria include: (1) environmental pressures for thinness; (2) parental psychopathology; and (3) intra-individual characteristics.

Sample Selection Based on Environmental Pressures for Thinness

Environmental pressures toward thinness have long been implicated in the development of EDs (Boskind-Lodahl, 1976;

Bruch, 1978; Garfinkel & Garner, 1982). Previous reports indicated a higher incidence of EDs among individuals who are in occupations or athletic pursuits that emphasize low body weight (Crago, Yates, Beutler, & Arizmendi, 1985; Garner & Garfinkel, 1978, 1980; Lundholm & Littrell, 1986). Logically, members of these subcultures have been regarded by many investigators (Garner & Garfinkel, 1980; Patton & King, 1991) as the ideal target samples for risk research on EDs.

Two small-scale prospective studies defining risk according to this approach have been conducted. Szmukler, Eisler, Gillies, and Hayward (1985) examined the development of eating disturbances in a sample of 100 female ballet students. At initial assessment, subjects completed scales measuring eating disturbances, social demographic data, weight and menstrual history. Out of the original sample, 25 girls who showed either elevated scores on the Eating Attitudes Test (EAT: Garner & Garfinkel, 1979) or current amenorrhoea were invited for a semi-structured interview. The selected girls were also retested and re-interviewed one year later. Results indicated that symptoms of EDs such as amenorrhea, low body weight, and stringent dieting were extremely common among ballet students. These authors indicated that the high level of disordered eating behaviors made it extremely difficult to judge the diagnostic significance of these behaviors in their sample.

Nevertheless, the first interview identified seven possible cases of clinical EDs (7% of the original 100 girls) and two subclinical cases. The follow-up interview one year later, however, revealed that all nine cases had shown considerable improvement in terms of weight gain without any medical intervention, and were able to continue their careers without serious interruption over the ensuing year. Based on these observations, Szmukler et al. argued that the higher incidence of EDs previously reported among ballet students could be misleading because many of them only superficially resemble those individuals with the actual clinical syndromes.

The second study, conducted by Garner, Garfinkel, Rockert, and Olmsted (1987), examined the persistence of eating symptoms and the factors which predict clinical EDs in a sample of 55 female ballet students. At initial testing, subjects completed questionnaires assessing weight, menstrual status, eating disturbances, family functioning, and other personality variables (locus of control and feeling of inadequacy). Thirty-two of the original 55 subjects were retested two years later. Those who showed signs suggestive of an ED were interviewed. Like Szmukler et al. (1985), Garner et al. also encountered difficulties in evaluating the diagnostic significance of disordered eating behaviors in their sample because symptoms such as amenorrhea, low body weight, and stringent dieting were

extremely widespread. Nevertheless, nine cases of AN and one case of BN were found (18% of the original 55 girls). Four cases of partial syndrome were also reported. Comparison between "cases" and "non-cases" indicated that body dissatisfaction and drive for thinness at initial testing were the only variables which differentiated these two groups. Four years after the initial testing, five of the 14 cases who remained at the ballet school were re-assessed. While most had gained weight at follow-up, all continued to experience distress in their struggle with food and weight. Based on findings from this small sample, Garner et al. argued that environmental pressures to maintain extreme thinness may lead to "sustained" rather than "transient" eating pathology as suggested by Szmulker et al. (1985).

The usefulness of the environmental risk approach, while intuitively appealing, is limited by at least two factors. First, both Szmulker et al. (1985) and Garner et al. (1987) reported that eating and weight irregularities are extremely common among members of subcultures that emphasize low body weight. The clinical significance of these behaviors in such samples, however, is difficult to evaluate. Szmulker et al. (1985) argued that the previously reported higher incidence of EDs among members of these subcultures is misleading because many of these so-called "probable cases" only superficially resemble the actual

clinical cases. Recent findings from other weight-concerned subcultures seem to support their contention. For example, King and Mezey (1987) found that the strong environmental demand for low body weight in male racing jockeys was also associated with a high incidence of diverse eating abnormalities (e.g., extreme dieting, bingeing, and self-induced vomiting). However, they do not show other psychological characteristics (such as a pervasive sense of self-inadequacy) usually observed among ED patients. More importantly, their eating abnormalities usually disappeared during the off-season. These findings suggest that there may be fundamental differences between behaviors aimed principally at maintaining a low weight for vocational purposes and the central pathology of an ED. Furthermore, recent studies based on community samples also failed to confirm the association between weight-related career choices and eating pathology (Johnson-Sabine, Wood, Patton, Mann, & Wakeling, 1988; Patton, Johnson-Sabine, Wood, Mann, & Wakeling, 1990).

Second, while a minority of members of these weight-concerned subcultures developed EDs after they were exposed to chronic environmental pressures to be thin (Garner & Garfinkel, 1980; Johnson-Sabine, et al., 1988), the majority of the ED patients do not come from these subcultures (Garfinkel & Garner, 1982). The generalizability of findings from these highly selective risk samples,

therefore, is likely to be limited.

Sample Selection Based on Maternal Psychopathology

A risk criterion that has been widely used by risk researchers studying other psychiatric disorders is parental psychopathology (see Ledingham, 1990). It gains ascendancy over other risk criteria because genetic-epidemiologic studies indicate that most major psychiatric disorders are more common in first degree relatives of the affected person than would be expected by chance. For example, 12.8% of the offspring of schizophrenic individuals (Gottesman & Shields, 1982), 18% of sons of severe alcoholics (Goodwin 1979), and 18.4% of children of unipolar depressives (Weissman et al., 1984) succumb to these disorders. For these disorders, defining risk on the basis of parental psychopathology is especially useful because of the high rate of expected incidence among the probands.

The applicability of this risk approach in studying EDs, however, is less certain. While several studies have reported a higher incidence of AN and BN among first-degree female relatives (i.e., mothers and female siblings) of ED patients than those of control subjects (Gershon et al., 1984; Hudson, Pope, Jonas, Yurgelun-Todd, & Frankenburg, 1987; Kendler et al., 1991; Strober, Lampert, Morrell, Burroughs, & Jacobs, 1990), there is little systematic information on mother-child concordance for AN or BN (Strober, 1991). Some investigators (Garfinkel & Garner,

1982) reported that the occurrence of clinical EDs in both a mother and a child is a relatively rare phenomenon. It is, therefore, uncertain to what extent defining risk on the basis of maternal psychopathology will enhance the yield rate.

Another potential problem of this risk approach pertains to the constant changes in our diagnostic system. This problem is best exemplified by the struggles encountered by risk researchers studying schizophrenia. Most of the risk studies on schizophrenia began in the late 60s and early 70s, and the majority of them defined risk on the basis of maternal psychopathology (Watt, Anthony, Wynne, & Rolf, 1984). Schizoaffective and schizophreniform disorders in DSM-III, however, have removed a significant portion of schizophrenia's constituency as it existed in DSM-II. These changes caught all of these risk studies in midstream. Reclassifications of index parents according to the new diagnostic criteria was time-consuming and costly, with the general effect of shrinking the size of the original risk samples. Moreover, these changes in the risk status of the samples have complicated the interpretation of many earlier findings concerning developmental antecedents of the high risk subjects. This issue is particularly relevant for risk research on EDs because both AN and BN are relatively new diagnostic entities, and future modifications of their diagnostic criteria are almost inevitable (Wilson &

Walsh, 1991).

Sample Selection Based on Intra-individual Characteristics

Holzman (1982) indicated that not all persons who constitute a "risk population" (e.g., ballet dancers or offspring of ED patients) are truly "vulnerable". Vulnerability refers to "a perceivable or measurable variation in structure or function that represents a predisposition to a specific disease process ... All of these traits are identifiable prior to the onset of the disease and place the person possessing such traits in a position of being susceptible to the specific disorder, given certain known or as yet unknown environmental conditions." (pp.19-20) According to Holzman, a more precise risk approach would be to identify the risk sample on the basis of certain reliable intra-individual vulnerability markers. Intra-individual vulnerability markers for psychopathology can be classified into two major categories: biological and behavioral markers. Biological vulnerability markers refer to biochemical, anatomical or neurophysiological traits. Behavioral vulnerability markers refer to observable behavior patterns, signs or symptoms.

Biological risk approach. Different neurobiological parameters have been used in risk studies of other forms of psychopathology. For example, deviant patterns of autonomic functioning have been used in identifying individuals at risk for schizophrenia (Mednick, Schulsinger, & Garfinkel,

1975). Low levels of platelet monoamine oxidase (MAO) have been used in identifying individuals at risk for schizophrenia, alcoholism, and depression (Coursey, Buchsbaum, & Murphy, 1982; Siever & Coursey, 1985).

Although neurochemical and neuroendocrinal abnormalities have repeatedly been observed in both AN and BN (for review, see Fava, Gopeland, Schweiger, & Herzog, 1989; Kaplan & Woodside, 1987), the application of this risk approach in studying EDs is both premature and impractical. First, while some investigators (e.g., Donohoe, 1984) have postulated that certain of these neurochemical abnormalities may precede the onset of abnormal eating behaviors, the evidence for the most part to date indicates that changes in hypothalamic-pituitary function in ED patients are secondary to dieting and caloric deprivation, and that refeeding and weight gain usually ameliorates these neuroendocrine changes (e.g., Fichter, Doerr, Pirke, & Lund, 1982; Keys Brozek, Henschel, Mickelsen, & Taylor, 1950; Walkeling, 1985). Without further clarification of the nature of these neurochemical abnormalities in ED patients, it is clearly premature to apply these biochemical abnormalities in screening nonclinical population for high risk subjects.

Second, identifying a representative and adequately sized risk sample inevitably requires large-scale screening of a non-clinical population, often within a setting (e.g. high school) over which investigators have little control.

In these circumstances, practicality is a major concern. The biological risk approach is uneconomical because it often involves collection of either blood or urine samples and costly assays from relatively large groups before risk subjects identification may proceed. Moreover, these intrusive testing procedures preclude group screening and, therefore, make it difficult to recruit participants.

Behavior risk approach. Risk may also be defined by certain observable behavior characteristics. Eating pathology has been viewed by many investigators as part of a continuum (Nylander, 1971; Streigel-Moore, Silberstein, & Rodin, 1986; Vandereycken & Pierloot, 1983), ranging from little concern with weight and normal eating, to normative discontent with weight and moderately disregulated eating, to the clinical extremes of AN and BN. Some investigators (Button & Whitehouse, 1981; Hsu, 1990; Killen et al., 1986; Nylander, 1971) have suggested that individuals who fall in the middle range on this continuum (i.e., show elevated signs of eating disturbances but do not fully meet the diagnostic criteria) may be at risk for EDs.

a. Symptom-related risk criteria. Two prospective studies defining risk on the basis of "attenuated eating symptoms" have been conducted. Using a set of predefined risk criteria (dieting in connection either with possible anorectic symptoms, or weight loss of at least 10 kg, or a history of psychiatric disorders), Schleimer (1983)

identified 130 high risk girls out of a sample of 1241 high school girls. Of the 130 high risk girls, 111 subjects could be assessed through clinical interviews. Of these 111 girls, 97 were re-assessed through interview about 10 years later, while 12 subjects completed a questionnaire. Results indicated that 15 (11%) out of the 111 high risk girls had received a diagnosis of AN. All 15 cases, however, already had manifest anorectic behaviors or had AN at or before the time of initial screening. None of the subjects who were symptom-free at the time of initial screening developed the disorder during the follow-up period. More importantly, Schleimer observed that besides attenuated eating disturbances, all future AN cases also displayed multiple psychiatric symptoms (e.g., dysphoria, depression, and compulsions) and personality features such as low self-esteem and fears about interpersonal relationships during the premorbid phase of the disorder.

In another study, Johnson-Sabine and her colleagues (Johnson-Sabine et al., 1988; Patton et al., 1990) used the short form of the Eating Attitude Test (EAT-26: Garner, Olmstead, Bohr, & Garfinkel, 1982) and the General Health Questionnaire (GHQ: Goldberg & Hillier, 1979), a measure of general psychiatric disturbances, to identify high school girls at-risk for EDs. Of a sample of 1010 adolescent girls, 83 girls obtained a score at or above the clinical cutoff point of 20 on the EAT-26 and were classified as at-

risk. Two control groups consisting of girls who scored below the clinical cutoff on the EAT-26 were also formed, one (n=74) with a high GHQ score, and the other (n=73) with a low GHQ score. Girls from all groups were interviewed two weeks after the initial screening. Significantly more clinical cases were found in the high risk group (20 out of 83) than in the low Eat - high Psychopathology group (2 out of 74) or the low Eat - low Psychopathology group (0 out of 73). Notably, many high risk girls (65 out of 83) were also found to have significant psychiatric disturbances. Of the 20 cases found in the high risk group, 17 were from this "double positive" subgroup. Based on this observation, Johnson-Sabine et al. (1988) speculated that girls who show both eating and psychiatric disturbances may be at highest risk for EDs. Findings from follow-up assessment 12 months later confirmed their speculations (Patton et al., 1990). Girls who showed both eating and psychiatric disturbances at initial screening were more likely to received a diagnosis of clinical ED than girls who showed eating or psychiatric disturbances only. Like Schleimer (1983), these investigators also reported that most of the cases identified at follow-up had significant eating disturbances at initial testing.

Findings from the two studies indicate that individuals who show both attenuated eating problems and other psychiatric symptoms are at elevated risk for later clinical

EDs. The strategy of identifying risk subjects on the basis of attenuated symptoms, however, faces a serious logical dilemma. The obvious question is: do these attenuated symptoms tap an existing pathological process or the susceptibility to such a process? Findings from both studies clearly point to the insidious nature of EDs. By defining risk on the basis of attenuated symptoms, one is likely to pick up individuals who are already caught up in a pathological process. The more general and extensive the disturbance, the more likely will this be the case. If primary prevention and early treatment of EDs are the ultimate goals of high risk research, then the advantages of this risk approach will be minimal. Moreover, the study of attenuated symptom patterns in relatively close temporal proximity to full-blown disorder will not add significantly to our understanding of the etiology of these disorders.

b. Non-symptom risk criteria. To be able to examine the premorbid features of EDs with minimal confounds from prodromal symptoms, it would be preferable to identify high risk girls on the basis of deviant psychological characteristics which do not include clinical signs or symptoms of EDs. Only one group of investigators (Kiemle, Slade, & Dewey, 1987; Slade & Dewey, 1986) has attempted to identify individuals at risk for EDs on the basis of non-symptom psychological characteristics. Slade (1982) argued that eating pathology is a secondary adaptation to certain

psychological "setting conditions" (p.169). These conditions are hypothesized to involve a combination of "general dissatisfaction with oneself and loss of control over one's life" and "perfectionist tendencies." Together, these psychological features generate a need on the part of the individual to seek complete control over some aspects of their life. Since complete control is impossible whenever other people are involved, Slade argues that such persons will be predisposed toward body and weight control. Based on this theoretical perspective, Slade and Dewey (1986) developed the SCANS (Setting Conditions for Anorexia Nervosa Scale), a self-report instrument which taps these hypothesized setting conditions. The authors posited that individuals who score high on these psychological features are at risk for EDs. To test their risk model, the SCANS and the Eating Attitudes Test (Garner & Garfinkel, 1979) were administered to 227 high school girls, 141 female college students, 354 student nurses and 40 ED patients. Factor analyses of the SCANS indicated that the factor structures of their hypothesized constructs were weak at best (e.g., many items loaded on more than one factor, and the two key constructs extracted less than 25% of the total variance). Nevertheless, 98 individuals of the nonclinical groups who scored high on the SCANS were defined as "at-risk." Findings indicated that although the "at-risk" group scored significantly higher on the EAT than the control

group, their mean score was too far below the clinical cutoff of the EAT to have any clinical significance. Similar results were obtained in a second study undertaken by this group one year later (Kiemle, et al., 1987). In sum, these findings provide little support for the utility of their proposed risk construct.

AN ALTERNATIVE RISK MODEL

The foregoing review points to a dearth of systematic risk studies on EDs. Of the risk approaches reviewed above, the non-symptom behavior risk approach appears to be the most promising strategy and one that merits further examination. This approach has several advantages. First, by defining risk on the basis of non-symptom target behaviors, it avoids the logical dilemma discussed earlier that plagues the symptom-based risk criterion. Second, it allows researchers to define risk on the basis of psychological vulnerability markers which characterize a broad spectrum of ED patients. Data collected from this risk approach are likely to have greater generalizability than the environmental and the genetic risk approaches, both of which tend to focus on selected minorities of the ED population. Third, compared to biological traits, psychological vulnerability markers in general are easier to measure and more economical to use, and therefore more suitable for large scale screening. Moreover, the non-symptom behavior risk approach allows researchers greater

flexibility to refine the discriminant efficacy of their risk models in at least two ways: (a) combining vulnerability markers from different behavior domains; and (b) assessing the effect of different cutoff scores. However, there has been little research to date along these lines. New and innovative risk models based on non-symptom behavior criteria are clearly needed.

The major purpose of the present study, then, was to develop a non-symptom behavior risk model to identify young girls at risk for EDs. To do so, it is essential to select vulnerability markers which are shared by a wide spectrum of ED cases, or what some researchers refer to as the "common denominators" of EDs (Pope & Hudson, 1988). Previous reports have provided a long list of vulnerability markers for EDs (Garfinkel et al., 1987; Hsu, 1989; Striegel-Moore et al., 1986). Of all suggested vulnerability markers, a pervasive sense of self-inadequacy meets the common denominator criterion and represents a construct of considerable promise for future risk research on EDs.

Pervasive Sense of Self-inadequacy

A pervasive sense of self-inadequacy has long been postulated by both clinicians and researchers to play an essential etiological role in the development of both AN and BN (Bruch, 1978; Casper, 1983; Geist, 1989; Rizzuto, Peterson, & Reed, 1981; Slade, 1982; Strober, 1991). Its relevance has been emphasized by Bruch (1985) who, after

four decades working with anorexic patients, concluded that the basic pathology in anorexic patients lies not in eating disturbance, but in underlying deficits in the sense of self. She indicated that long before the illness becomes manifest, pre-anorexic girls often experience an all-pervasive sense of ineffectiveness. They suffer from a deep fear of being incompetent and of being a "nothing" (p.10). They are "eternally preoccupied with the image they create in the eyes of others, always questioning whether they are worthy of respect" (p.15). They believe that they are basically inadequate, mediocre, inferior and despised by others. All their efforts are directed toward hiding their inadequacy. Constant dissatisfaction with their body and their relentless pursuit of thinness is just "a cover-up for underlying doubt about their own worth and value" (p.14).

A similar profile of self-inadequacy has also been observed in bulimic patients. Johnson and Connors (1987) indicated that low self-esteem is one of the most prominent psychological features found among bulimic women. Even prior to the disorder, these women often experience intense feelings of inadequacy and self-doubt. Because of the severe self-doubt, they often rely heavily on the opinions of others to evaluate their self-worth. They always over-accommodate to the needs of others and ignore their own needs in an effort to gain approval. Their vigilance concerning others' reactions to them makes them particularly

sensitive to rejection and vulnerable to criticism. In a sociocultural milieu which equates thinness with beauty and success, the pursuit of thinness represents an option for them to enhance their self-esteem. The repeated failures to achieve an unrealistic body shape, inevitably, result in a constant feeling of body-dissatisfaction.

Garner and Bemis (1985) also indicated that one of the most consistent clinical observations in ED patients is their self-concept deficits. According to these authors, women who develop EDs often experience themselves as inadequate in most areas of personal or social functioning. Although decreased self-esteem is one consequence of semistarvation, these indivdiuals' negative self-evaluation appears to precede weight loss and is not ameliorated by renourishment (Garner & Garfinkel, 1982). A distinctive aspect of their self-concept is that they rely heavily on weight, shape, or thinness as the "sole or predominant referent for inferring personal value or self-worth" (p.129). As a result, intense feelings of body-dissatisfaction are common among these individuals. Their consistently low self-evaluations also predispose them to respond more to the demands of others and behave less in response to their own thoughts and feelings. Favorable self-evaluation becomes rigidly bound to positive appraisals from others.

In summary, clinicians working with ED patients

generally concur that an underlying sense of self-inadequacy plays a key role in the development of EDs. Morevoer, this underlying self-concept deficit, as Garner and Bemis (1985) have indicated, is reflected in at least three inter-related dimensions: (1) low self-esteem, (2) self-worth which is rigidly tied to others' evaluations; and (3) high body-dissatisfaction.

Empirical studies which compared ED patients with normal controls have generally confirmed that both AN and BN patients are often characterized by: low self-esteem (e.g., Dykens & Gerrard, 1986; Katzman & Wolchik, 1984; Laessle, Kittl, Fichter, & Pirke, 1988; Laessle, Tuschl, Waadt, & Pirke, 1989), hypersensitivity to others' negative evaluations (e.g., Katzman & Wolchik, 1984; Laessle et al., 1989; Norman & Herzog, 1983), and high body dissatisfaction (e.g., Cooper & Taylor, 1988; Huon & Brown, 1989; Katzman & Wolchik, 1984; Laessle et al., 1988; Williamson, Davis, Goreczny, & Blouin, 1989). A similar profile of self-inadequacy has also been observed in high risk individuals who later developed clinical EDs (Garner et al., 1987; Schleimer, 1983) and young females with subclinical eating disturbances (Attie & Brooks-Gunn, 1989; Brown, Cash, & Lewis, 1989; Chandarana, Helmes, & Benson, 1988; Grant & Fodor, 1986; Cross & Rosen, 1988; Mintz, & Betz, 1988; Rosen, Gross, & Vara, 1987; Vanderheyden & Boland, 1987). Collectively, this evidence strongly suggests that low self-

esteem, high fear of negative evaluation and body dissatisfaction are robust vulnerability markers for EDs.

It is important to note, however, that each of these attributes, on their own, can be found in many individuals. For example, low self-esteem has been found to be associated with a wide spectrum of psychopathology (Harder, Strauss, Kokes, & Ritzler, 1984; Koenig, Howard, Offer, & Cremerius, 1984; Silverstone, 1991). Erikson (1968) indicated that many adolescents are particularly, indeed sometimes morbidly, preoccupied with how they appear in the eyes of others. This is particularly true for girls as they often define themselves primarily in relation to others in forming a sense of self (Gilligan, 1982). Body dissatisfaction has also been observed in the great majority of women in western industrialized societies (Connor-Greene, 1988; Grant & Fodor, 1986; Huenemann, Shapiro, Hampton, & Mitchell, 1966; Klemchuk, Hutchison, & Frank, 1990; Nylander, 1971; Strober & Yager, 1989). Garner and Bemis (1985) suggested that it may be the specific constellation of these attributes in their extreme form that distinguishes the future ED patients from other women. Given the substantial evidence suggesting that this profile of indicators of self-inadequacy represents the psychological "common denominator" in the development of EDs, the present study combined these inter-related attributes of the self to form a multi-faceted self-inadequacy risk construct in identifying young girls who may

be at risk for EDs.

VALIDATION CRITERIA

The utility of this multi-faceted self-inadequacy risk construct cannot be properly assessed until we know whether it is predictive of later EDs. To test this model's predictive validity, however, requires sufficient follow-up time. In the absence of follow-up data, Moffit, Mednick, and Cudeck (1983) suggested that the validity of a risk model could be tested by comparing high risk and normative individuals identified by the model on psychosocial features that characterize the premorbid functioning of ED patients. Candidates for EDs identified by a potentially useful risk model should at least display higher levels of premorbid features than the non-candidates. Accordingly, psychosocial features in the following areas were chosen to serve as validation criteria in evaluating the validity of this risk model.

Attenuated Eating Disturbances

Empirical evidence clearly indicates that both AN and BN are disorders of insidious onset. Almost all ED patients reported significant disordered eating behaviors (e.g., overrestrictive dieting, periodic binge-eating, or occasional purgeing) long before the development of full-blown clinical syndromes which meet the DSM-III-R criteria for AN and/or BN. For example, in her 10-year follow-up study, Schleimer (1983) indicated that among girls

identified as having AN during the follow-up period, all had attenuated anorectic behaviors at the time of the initial screening. More importantly, among those who at initial screening did not show any attenuated anorectic symptoms, none developed the disorder later during the follow-up period. In their one-year follow-up study, Patton et al. (1990) also found that most girls received a diagnosis of BN during the follow-up period had reported attenuated eating symptoms at the initial screening. Similar data have also been reported by Marchi and Cohen (1990). These authors found that BN in late adolescence or adulthood was always presaged by attenuated symptoms of the disorder. While attenuated eating pathology may not be ideal as vulnerability marker for reasons discussed earlier (see pp.14-15), available evidence clearly indicates that it represents a valuable validation criterion for the self-inadequacy risk model.

Psychiatric disturbances

Attenuated eating disturbances, however, are very common among young women (e.g., Button & Whitehouse, 1981; Chandarana et al., 1988; Gross, & Rosen, 1988; Huenemann et al., 1966; Mann et al., 1983). Measuring eating abnormalities alone, therefore, may not be sufficient in detecting clinically significant eating pathology (Garner, Olmsted, Polivy & Garfinkel, 1984). For example, Thomas and Schwartz (1982) compared ED patients with two groups of

college women: one with high and one with low scores on the Eating Attitudes Tests (Garner & Garfinkel, 1979). The high-EAT students resembled the ED patients and differed from the low-EAT students in the proportion of subjects reporting binge eating and self-induced vomiting. However, the high-EAT students reported fewer psychiatric disturbances than the ED patients, and no more than the low-EAT students. This study highlights two important facts. First, relying solely on eating symptoms to ascertain the incidence of clinical EDs may result in a high number of false positives. Second, the coexistence of elevated eating problems and other psychiatric disturbances in an individual often signals the existence of clinical eating pathology. These observations are supported by a substantial body of research which indicates that besides salient eating abnormalities, the majority of anorexic and bulimic patients also display multiple psychiatric symptoms (Crisp, 1970; 1984; Dykens & Gerrard, 1986; Fairburn & Cooper, 1984; Garner et al., 1990; Gross & Rosen, 1988; Johnson et al., 1982; Katzman & Wolchik, 1984; King, 1989; Laessle et al., 1989).

Evidence from the few available prospective risk studies also indicates that girls who later develop clinical EDs often display both elevated eating problems and multiple psychiatric symptoms during the premorbid phase. Schleimer (1983) reported that eating problems, observed in

emotionally healthy teenage girls, seldom proceeded to clinical AN. The same behaviors observed in emotionally disturbed girls, by contrast, often resulted in clinical EDs. Patton et al. (1990) also reported that general psychiatric distress was the one factor which significantly distinguished the eating disturbed high school girls who later developed EDs from those who did not.

Among the psychiatric symptoms associated with EDs, affective dysfunction is the most prominent. A substantial body of research indicates that 30%-50% of patients with AN and/or BN suffer from concurrent or past major depression (for review, see Strober & Katz, 1987; Swift, Andrews, & Barklage, 1986; Wilson, & Lindholm, 1987). While the exact nature of the relationship between eating and affective disturbances is still under debate (Devlin & Walsh, 1989; Leung & Steiger, 1991), it is generally agreed that depressive and biphasic moods are two key prodromal psychological features of both AN and BN (Cantwell, Sturzenburger, Burroughs, Salkin & Green, 1977; Gomez & Dally, 1980; Hudson, Pope, Jonas, & Yurgelun-Todd, 1983; Piran, Kennedy, Garfinkel, & Owens, 1985; Walsh, Roose, Glassman, Gladdis, & Sakik, 1985). Two recent studies aimed at detecting clinical ED cases among dieters also found that the presence of both elevated depressive and eating symptoms in a girl often signalled the existence of clinical eating pathology (Steiger, Leung, Ross, & Gulko, 1992; Steiger,

Leung, Puentes-Neuman, & Gottheil, 1992).

Another common psychological feature observed among AN and BN patients is obsessive-compulsiveness (Cantwell et al., 1977; Hudson et al., 1983; Hatsukami, Owen, Pule, & Mitchell, 1982; Kasvikis, Tsakiris, Marks, Basaglu, & Nashirvani, 1986; Rothenberg, 1986; Strober, 1980; Tisdale, Pendleton, & Marler, 1990). Clinically, the persistent preoccupation with food and weight in anorexic and bulimic patients resembles the repetitive and ritualistic behavior exhibited by patients with obsessive-compulsive disorder (Rothenberg, 1986, 1988). Neuro-physiologically, serotonin dysregulation has been implicated in obsessive-compulsive disorder, AN, and BN (Murphy & Pigott, 1990). These similarities have led to considerable research interest in recent years in the potential link between obsessive-compulsive disorder and EDs (Pigott et al., 1991; Rothenberg, 1990). Impulsivity has also been observed in many ED patients (Edwin, Andersen, & Rosell, 1988; King, 1989; Pyle, Mitchell, & Eckert, 1981; Prather & Williamson, 1988; Williamson, Kelley, Davis, Urggiero, & Blouin, 1985; Williamson, 1990). Crisp (1988) has argued that this turbulent mix of impulsivity and obsessionality may reflect the constant impulse control problems (under- or over-control) frequently observed in ED patients.

In summary, while the exact nature of the relationship between eating disturbances and concomitant psychiatric

symptoms is far from clear, the fact that these symptoms are frequently observed in ED populations as well as in individuals at risk for later EDs has been well-documented. This evidence suggests that the prodromal phase of EDs is often characterized by both elevated eating disturbances and multiple psychiatric symptoms such as dysthymia, depression, obsessionality and impulsivity. The co-occurrence of both eating and psychiatric symptoms, therefore, may provide a more reliable validation criterion than eating problems alone.

Family characteristics of ED populations

Family Dysfunction. Beyond the domain of symptomatology, many clinical reports have also documented the presence of disturbed family relationships during the premorbid phase of both AN and BN (for review, see Hsu, 1983; Kalucy, 1983; Kog & Vandereycken, 1989; Yager, 1982). For example, Morgan and Russell (1975) observed that disturbed family relationships antedated the illness in 54% of their anorexic patients. Similarly, Crisp, Hsu, Harding, and Hartshorn (1980) observed a disturbed premorbid relationship between patient and parents in over half of their 102 anorexia cases. In comparing the interaction patterns in 60 families (including families of anorexics, asthmatics, diabetics, and normative control individuals), Minuchin, Rosman, & Baker (1978) found that families of all clinical groups, particularly the anorexics, are

characterized by enmeshment, over-protectiveness, rigidity, conflict avoidance, and poor conflict resolution. These and many other similar observations have led many investigators to speculate that dysfunctional family relationships are significant predisposing factors in the development of the disorder (Bruch, 1973; 1978; Johnson & Connors, 1987; Munchin et al., 1978; Vandereycken, Kog, & Vanderlinden, 1989).

Family relationships are troublesome for bulimics as well. Recent studies on families of bulimics have indicated that these families are more conflictual and disorganized, and less cohesive and nurturing than control families (Humphrey, 1986; Garner, et al., 1985; Johnson & Flach, 1985; Kog, Vertommen, & DeGroote, 1986; Ordman & Kirschenbaum, 1986; Strober, 1981).

There is also speculation that family relationships may differ in different subtypes of ED patients. For example, families of bulimics and bulimic-anorexics have been reported to be more hostile, conflicted, disorganized, and less nurturing than families of restricting anorexics (Humphrey, 1988; 1989). The evidence to date for the most part, however, has not indicated any specificity of family relationship pattern to ED subtypes. Rather, general family dysfunctions such as low cohesion, poor conflict resolution, and disorganization are common in families of ED patients (Garfinkel & Garner, 1982; Kog & Vandereycken, 1989; Stern

et al., 1989; Wonderlich & Swift, 1990).

Family Attitudes Toward Weight and Shape. In addition to non-specific family dysfunctions, there is one family feature which has not received much attention: the heightened concerns with weight and appearance among immediate family members of ED patients. Bruch (1973) observed that parents of ED patients were often very concerned with weight and physical appearance themselves. While these characteristics are very common in our appearance-oriented culture, Bruch indicated that these features were particularly pronounced in families with an ED member. Kalucy, Crisp, and Harding (1977) also reported that 27% of mothers and 16% of fathers of anorexics overvalued the importance of weight and appearance. Moreover, 23% of the families had grossly deviant eating patterns which antedated illness in their ED relatives.

Similar findings have also been reported in studies of bulimic patients. In comparing family attitudes toward weight and appearance across bulimics, depressed patients, and normal controls, Wold (1985) found that family members of bulimic patients displayed more distress about overweight, and more derogatory attitudes toward obesity than did those in other groups. Wold believed that the attitude of the family toward weight and shape, an extension of the cultural emphasis on thinness as a beauty ideal, may be crucial for the development of an ED. Pike and Rodin

(1991) also found that mothers of girls with disordered eating were more concerned with weight and appearance themselves. They also rated their daughters as less attractive, and thought their daughters should lose weight.

To summarize, previous studies have indicated that general family dysfunction and heightened family concerns with weight and appearance are often observed in families of ED patients. There are, of course, limitations in these studies. First, the majority of studies in this area are retrospective, and so, any inferences regarding causation are tentative at best. Second, exactly how these dysfunctional family features foster the development of eating disturbances remains largely unexplored. Despite these limitations, there is sufficient evidence to suggest that these family characteristics are important for understanding the development of EDs and may be useful as validation criteria for the self-inadequacy risk model proposed in the present study.

RATIONALE OF THE PRESENT STUDY

Previous research strongly suggests that the unique constellation of low self-esteem, high fear of negative evaluation and body dissatisfaction represents a common psychological vulnerability marker for both AN and BN. In the present study these conceptually inter-related attributes of the self were combined to form a multi-faceted self-inadequacy risk construct to identify young girls who are vulnerable for EDs. Specifically, three major research questions were addressed in this study.

(1) Do young girls who display a self-profile characterized by extremely low self-esteem, high fear of negative evaluation and body dissatisfaction report more of the eating, psychiatric and family problems found in ED patients than girls who do not?

To evaluate the validity of the multi-faceted self-inadequacy risk model proposed in the present study, high school girls were classified into high risk (HR), intermediate risk (IR), or normative control groups using a composite score of self-esteem, fear of negative evaluation and body dissatisfaction. To provide a clinical reference group, a sample of ED patients was also included in the study. All groups were compared on measures of eating disturbances, psychiatric symptoms (i.e., depression, mood lability, obsessionality and impulsivity), and family characteristics (i.e., family cohesion, adaptability, and family attitudes toward weight and appearance). These

symptom and family variables were selected as validation criteria for the current risk model because previous studies have indicated that ED patients often report attenuated eating disturbances and various psychiatric symptoms long before they develop a full-blown clinical ED (Patton et al., 1990; Schleimer, 1983; Marchi & Cohen, 1990). There is also evidence that they are more likely to come from families with dysfunctional relationships (such as low cohesion and adaptability) and heightened concerns with weight and appearance (Kagan & Squires, 1986; Pike & Rodin, 1991; Wold, 1985). It was hypothesized that girls who display a self-profile characterized by extremely low self-esteem, high fear of negative evaluation and body dissatisfaction will report more of the eating, psychiatric, and family problems found in ED patients than girls who do not.

(2) <u>What are the multivariate relational features among family characteristics, attributes of self-inadequacy, eating and psychiatric symptomatology?</u>

Family influences and self-concept deficits have been widely commented upon in relation to the development of EDs. A major impediment to our understanding of how different family characteristics, attributes of self-inadequacy, and eating and psychiatric symptomatology are inter-related is the exclusive use of univariate strategies in ED research that deal with simple relations between simplistic constructs. Little is known about the multivariate

relational features among these variables. As many investigators (Johnson & Connors, 1987; Shaw & Garfinkel, 1990) have indicated, there is a need to assess the full complexity of these inter-relations using multivariate strategies. In the present study, multiple measures were used to assess family characteristics, attributes of self-inadequacy, eating and psychiatric symptomatology. More than one configuration of within- and inter- domain relations may exist. Clarification of the nature of these relations will enhance our understanding of the multivariate relations among these variables in the development of eating pathology. Toward this end, the present study applied canonical correlation analyses to explore multivariate relations: (1) between family characteristics and attributes of self-inadequacy; (2) between family characteristics and symptomatology; and (3) between attributes of self-inadequacy and symptomatology. Because of the exploratory nature of these analyses, it was deemed premature to make specific predictions.

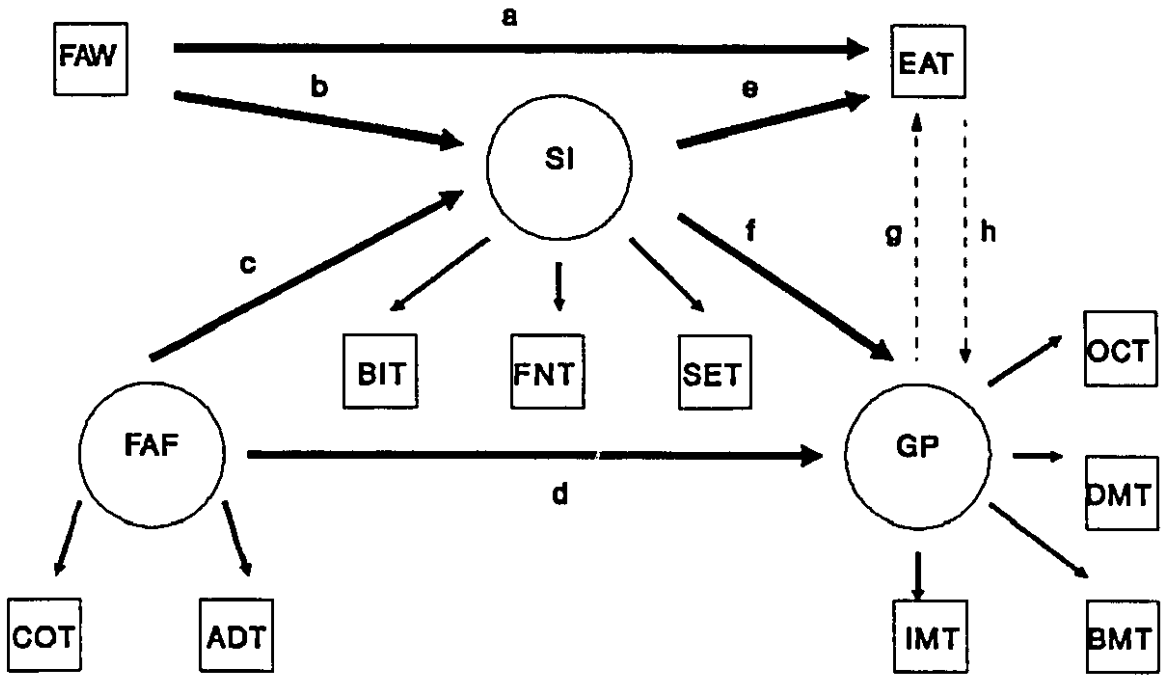
(3) What are the "causal" links among family characteristics, attributes of self-inadequacy, and eating and psychiatric symptomatology?

Traditionally, risk has always been understood largely within an actuarial framework. The statistical association between a vulnerability marker and a pathological outcome tells us little about the underlying mechanism involved. As Ramey, Yeates, and MacPhee (1984) point out, risk is

fundamentally a prediction in want of an explanation. To proceed beyond "risk as prediction", the present study also attempted to develop a parsimonious path model that can help us understand the possible causal relationships among family characteristics, attributes of self-inadequacy and symptomatology. The basic model (see Figure 1) includes 11 measured and three latent variables. Family cohesion (COT) and adaptability (ADT) are assumed to index a latent general Family Functioning (FAF) construct. Self-esteem (SET), fear of negative evaluation (FNT), and body dissatisfaction (BD) are assumed to index a latent Self-inadequacy (SI) construct. Depression (DMT), biphasic mood (BMT), obsessive-compulsiveness (OCT), and impulsivity (IMT) are assumed to index a latent General Psychiatric Disturbances (GP) construct. In general, the proposed model predicts that general family dysfunction (FAF) and family attitudes toward weight and appearance (FAW) contribute directly to the development of a vulnerable self-profile characterized by low self-esteem, high fear of negative evaluation and body dissatisfaction (the hypothesized high risk profile). This vulnerable self-profile, in turn, will predispose young girls to develop both eating (EAT) and psychiatric disturbances (GP). Within this general framework, the following causal hypotheses were tested:

Figure 1

A General Path Diagram of Possible Causal Relations Between Family Characteristics, Attributes of Self-inadequacy, and Eating and Psychiatric Symptomatology.



Note. FAW = Family Attitudes Toward Weight and Appearance; FAF = Family Functioning; SI = Self-inadequacy; BIT = Body-dissatisfaction; FNT = Fear of Negative Evaluation; SET = Self-esteem; EAT = Eating Disturbances; GP = General Psychiatric Disturbances; OCT = Obessive-compulsiveness; DMT = Depression; BMT = Biphasic Mood; IMT = Impulsivity.

(a) Family attitudes toward weight and appearance have a direct effect on a sense of self-inadequacy, both direct and indirect effects (mediated by self-inadequacy) on eating disturbances, and an indirect effect (mediated by self-inadequacy) on psychiatric disturbances.

b) Family functioning has a direct effect on a sense of self-inadequacy, both direct and indirect effects (mediated by self-inadequacy) on psychiatric disturbances, and an indirect effect (mediated by self-inadequacy) on eating disturbances.

(c) A sense of self-inadequacy has direct effects on both eating and psychiatric disturbances.

(d) The causal direction between eating pathology and psychiatric distress has long been a subject of controversy (see Devlin & Walsh, 1989; Leung & Steiger, 1991). One view (e.g., Johnson & Connors, 1987) argues that psychiatric distress observed among patients of eating disorders reflect primary characterological disturbances, and these disturbances render an individual more vulnerable to develop eating pathology. Another view (e.g., Garner et al., 1990) argues that psychiatric distress represent secondary elaborations of chronic eating disturbances. To test these competing hypotheses, both causal directions were tested.

METHOD

Subjects

The high school sample consisted of 393 French-speaking and 525 English-speaking girls (a total of 918 students) from eight high schools in Montreal. The students ranged in age from 12 to 17 years. Mean ages for English and French girls were 14.60 (± 1.42) and 14.56 (± 1.39), respectively. They were attending the 8th through 11th grades at the time of testing. Four hundred and seventy-nine girls were in grades 8 or 9, and 439 girls were in grades 10 or 11. Participating schools were located in a broad range of neighbourhoods (urban and suburban), and could be considered as representative of Montreal in social class distribution. Schools were selected according to the following considerations: (1) no involvement by students in other research projects; and (2) willingness on the part of the administration to schedule a class period for students to complete the measures.

As a clinical reference group, 74 female ED outpatients from a ED clinic in Montreal were also tested. Forty-two patients were French-speaking and 32 were English-speaking. Patients ranged in age from 19 to 37, mean ages for English and French patients were 26.41 (± 7.00) and 27.54 (± 6.58), respectively. All patients met DSM-III-R (APA, 1987) criteria for EDs: 18 suffered from anorexia, 49 suffered from bulimia, and seven suffered from atypical ED. All

patients were at an early stage of treatment at the clinic when tested.

Measures

Descriptive Variables

Information regarding parental occupation, level of education, subjects' age, weight, and height of the high school sample was obtained using a questionnaire shown in Appendix B. Many students were unable to provide information about their parents' level of education or occupation. The paucity and potential unreliability of these data precluded computation of SES as a variable. The omission of direct SES information did not appear to pose problems in interpreting results as: (1) most recent studies have indicated that SES is largely irrelevant in the development of EDs (Chandarana, et al., 1988; Dolan, Evans, & Lacey, 1989; Lachenmeyer & Muni-Brander, 1988; Pope, Champoux, & Hudson, 1987); and (2) socio-economic factors were not directly pertinent to the hypotheses of the present study.

For the high school sample, a measure of Body Mass Index (BMI: weight/height^2) for each subject was also determined from the self-reported weight and height data. Various studies which compared self-reported versus actual weights found self-reported weight to be remarkably accurate among adolescent girls (King, 1989; Pike & Rodin, 1991). The BMI of the patients, on the other hand, was derived from

their actual weight and height measured during the intake interview at the clinic.

Translation of measures

Measures used in this study were presented either in English or French according to the principal medium of instruction at each school. Validated French versions of the EAT-26, the Body-dissatisfaction Scale, the Brief Impulsivity Scale (Steiger, Leung, & Houle, 1992), the Depression and the Obsessive-Compulsive subscales of the SCL-90-R (Derogatis, 1983) were available. Other measures that did not have a French version were translated into French and then back-translated as a validity check.

Self-inadequacy

The following three self-report instruments were used to capture the full complexity of self-inadequacy as a multi-faceted construct: (a) Rosenberg's Self-Esteem Scale (Rosenberg, 1979); (b) the Fear of Negative Evaluation Scale (Leary, 1983); and (c) the Body Dissatisfaction Scale of the Eating Disorder Inventory (Garner, Olmsted, & Polivy, 1983). These measures were selected for the following reasons: (1) each of them has demonstrated validity in ED research (Williamson, 1990); (2) simple in terms of ease of understanding of item content, and assured reliability of ratings by girls at fairly young ages; and (3) brief, an important consideration when time for adminstration of an extensive test battery is limited. Self-report methodology

was used for three reasons. First, adolescents have sufficient psychological sensitivity and cognitive skills to provide a valid self-portrait (Offer, Ostrov, & Howard, 1981). Second, how adolescents view themselves often has greater significance and impact on attitude, affect, cognition and behavior than "objective" measures (Swift, Bushnell, Hanson, & Logemann, 1986). Third, to test a large sample in a setting over which researchers have little control, practical considerations are important. Ease of administration and acceptability of the procedure to respondents make self-report a preferable means for screening a large sample.

Rosenberg's Self-Esteem Scale (RSE). The RSE is a 10-item instrument designed to assess global self-regard of both adolescents and adults (see Appendix C). The construct validity and the predictive utility of the instrument are well documented (Corcoran & Fischer, 1987). A two-week test-retest reliability coefficient of .88 and a Guttman scale coefficient of .92 are reported (Rosenberg, 1979). In the present study, alpha coefficients for the English and French versions of this scale were .92 and .89, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from not at all true of me (1) to always true of me (5). High RSE scores reflect high global self-esteem.

Fear of Negative Evaluation Scale (FNE). The FNE is a

12-item self-report inventory designed to assess the fear of receiving negative evaluation among both adolescents and adults (see Appendix D). A test-retest correlation of .75 over a four week period and an alpha of .90 are reported (Corcoran & Fischer, 1987). In the present study, alpha coefficients for the English and French versions of this scale were .89 and .90, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from not at all true of me (1) to always true of me (5). Higher FNE scores reflect greater fear of receiving negative evaluation.

Body Dissatisfaction Scale (BD). The BD is a 8-item instrument that assesses attitudes toward different body parts (see Appendix E). Test-retest reliability information has not been reported, but internal consistency of the scale has been found to be excellent (alpha = .92). In the present study, alpha coefficients for the English and French versions of this scale were .91 and .89, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from never (1) to always (5). High scores reflect greater dissatisfaction with one's body-image.

Validation Measures

Besides scales tapping attributes of self-inadequacy, subjects also completed multiple measures assessing eating disturbances, psychiatric symptoms, and family characteristics that have been reported to be associated

with the development of EDs.

Eating disturbances

Eating Attitudes Test (EAT-26: Garner et al., 1982). Eating disturbances were assessed by means of the EAT-26 (see Appendix F). This scale consists of 26 items tapping maladaptive eating attitudes and behaviors frequently observed in anorexics and bulimics. It has been validated with both anorexic and bulimic patients, and has been used widely to identify eating disturbances in nonclinical adolescent and adult samples (e.g., Button & Whitehouse, 1981; Johnson-Sabine, et al., 1990). A cutoff score of 20 reliably identifies eating pathology of clinical significance. Internal consistency of the scale is reported to be excellent (alpha = .85). A test-retest reliability coefficient of .72 over a 6-month period has also been reported (Leung & Steiger, 1991). In the present study, alpha coefficients for the English and French versions of this scale were .86 and .84, respectively. Subjects were asked to rate each items on a 6-point Likert scale ranging from always (1) to Never (6). High EAT-26 scores reflect more eating disturbances.

Psychiatric symptoms

Depression Subscale of the SCL-90-R (Derogatis, 1983). Depressive symptoms were assessed by means of the Depression Subscale of the SCL-90-R (see Appendix G for sample items). This scale consists of 13 items tapping common non-

vegetative signs and symptoms of depression. A test-retest correlation of .84 over a two week period and an alpha of .90 are reported. In the present study, alpha coefficients for the English and French versions of this scale were .90 and .88, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from not at all (0) to extremely (4). High scores reflect more depressive symptoms.

Obsessive-compulsive Subscale of the SCL-90-R (Derogatis, 1983). Obsessive-compulsive behavior features were assessed using the Obsessive-compulsive Subscale of the SCL-90-R (see Appendix G for sample items). This scale consists of 10 items tapping unremitting or irresistible thoughts and actions commonly reported by neurotic individuals. A test-retest correlation of .85 over a two week period and an alpha of .86 are reported. In the present study, alpha coefficients for the English and French versions of this scale were .81 and .76, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from not at all (0) to extremely (4). High scores reflect more obsessive-compulsive symptoms.

Biphasic Mood Scale of the General Behavior Inventory (GBI: Depue et al., 1981). Mood lability was measured by the Biphasic Mood Scale of the GBI (see Appendix H). This is a 7-item instrument designed to measure biphasic mood shifts. Test-retest reliability information is not

available. Greenberg and Harvey (1987), however, reported good internal consistency for the scale (alpha = .71). In the present study, alpha coefficients for the English and French versions of this scale were .85 and .84, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from not at all true of me (1) to always true of me (5). High scores reflect greater mood lability.

Brief Impulsivity Scale (BIS: Steiger et al., 1992). Impulsivity was assessed by means of the BIS (see Appendix I). This scale is a 10-item instrument designed to measure impulsive behaviors (e.g., difficulty in deferring gratification, or failure to consider consequences of actions) among adolescents and young adults. Items were inspired by the impulsivity subscale of the California Psychological Inventory (Gough, 1969). Although test-retest reliability information is not available, internal consistency has been reported to be excellent (alpha = .82). In the present study, alpha coefficients for the English and French versions of this scale were .81 and .77, respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from not at all true of me (1) to always true of me (5). High scores reflect more impulsive behaviors.

Family characteristics

Family Adaptability and Cohesion Evaluation Scale III

(FACES-III: Olson, Portner, & Lavee, 1985). General family functioning was assessed by means of the FACES-III (see Appendix J). This scale consists of two 10-item subscales designed to measure family cohesion and adaptability. The Family Cohesion Subscale assesses the emotional bonding that family members have toward one another. The Family Adaptability Subscale assesses the extent to which the family system is able to change its power structure and role relationships on the basis of situational and developmental demands. FACES-III was chosen for the present study because family cohesion and adaptability are two dimensions of family functioning which have been reported to be particularly relevant to EDs (Kagan & Squires, 1986). This scale can be rated by either parents or children. Recent studies which compared daughters' and parents' ratings have reported that daughters' ratings had the greater validity and were better as predictors of their EDs (Waller, Calam, & Slade, 1988; Waller, Peter, & Calam, 1990). FACES-III has fair internal consistency with an overall alpha of .68 for the total instrument, .77 for cohesion, and .62 for adaptability. Test-retest data are not available; but for FACE-II, however, a four- to five- week test-retest correlation of .83 for cohesion and .80 for adaptability is reported. In the present study, alpha coefficients for the English and French versions of these subscales were .71 and .63 on Adaptability and .91 and .87 on Cohesion,

respectively. Subjects were asked to rate each item on a 5-point Likert scale ranging from never (1) to always (5). FACES-III was originally designed to measure the curvilinear hypotheses of the Circumplex Model of family functioning. However, there is considerable evidence that this scale is a linear rather then curvilinear measure (Green, Harris, Forte, & Robinson, 1991). In the present study, this scale was scored in a linear way as recommended by Olson (1991). Low Cohesion scores indicate "incohesion"; low Adaptability scores indicate "rigidity".

Family Attitudes Toward Weight and Appearance. Family attitudes toward weight and appearance were assessed by means of a 6-item scale designed specifically for the present study (see Appendix K). Each item on this brief instrument has good face validity for measuring the intended construct (Item samples: "Members of my family watch their weight carefully" and "Members of my family put great emphasis on physical appearance"). In the present study, alpha coefficients for the French and English versions of this measure were .68 and .67, respectively. Subjects were asked to rate each item on a 5-point scale ranging from never (1) to always (5). Higher scores reflect greater family concerns about weight and appearance.

Procedure

Students were informed about the study by their teachers after the project had been approved by the

authorities of their schools. Each subject was given a letter addressed to their parents explaining the purpose of the research and a consent form (see Appendix L). To avoid response bias, the study was presented as a "Survey on Women's Health Problems". Students completed the scales at their schools in groups of 30 to 40 during a regular class period, with a research assistant present to answer questions. To reduce test-taking defensiveness, it was emphasized that the research was being conducted by individuals who had no connection with the school and teachers, and that all information collected was confidential. All scales were presented in one test booklet in random order except that the demographic questionnaire appeared first and the EAT-26 measure appeared last. The test battery took approximately 45 minutes to complete.

Patients were informed about the study by their therapists. They completed the scales at home as part of a large test battery routinely given to assess their overall functioning at the beginning of therapy. To minimize confounding of assessment with treatment, all patients were required to complete the test battery within the first two weeks of treatment.

RESULTS

The data analysis in this study proceeded in three stages. The first stage of the analysis evaluated the validity and utility of this risk model using factor analyses and Multivariate Analysis of Variance (MANOVA). Significant multivariate F tests were followed up with univariate ANOVAs and Tukey post hoc multiple comparisons. The second stage of the analysis explored the within- and inter- construct relations among measures of family characteristics, attributes of self-inadequacy, eating and psychiatric symptomatology. Canonical correlation analysis was used to examine multivariate relations between sets of intercorrelated variables (Cohen & Cohen, 1983). The third stage of the analysis applied structural equation modelling to examine causal relations between family characteristics, attributes of self-inadequacy, eating and psychiatric symptomatology.

Preliminary analyses

Transformation. Raw scores of the different scales of psychiatric symptoms were converted to T-scores to provide a standardized unit of measurement. Examination of the distributions of variables revealed that the scale score of the EAT-26 among the high school sample was considerably skewed in the positive direction, a finding which has been reported in previous studies (e.g., Garner et al., 1982; Mann et al., 1983; Steiger et al., 1992). To reduce

skewness in the EAT-26 scores, a base 10 log transformation, as recommended by Tabachnick and Fidell (1989), was conducted. Although the skewness of the distribution was significantly reduced by the log transformation, the lack of variance in EAT-26 scores probably resulted in underestimation of the magnitude of the various relationships between eating and other variables.

Intercorrelations. Table 1 presents the intercorrelations among the variables of the study. Correlations between descriptive variables (age and body mass index) and other variables were generally low. Among experimental variables, within- construct correlations were higher than the between- construct correlations. Correlation between family cohesion and adaptability was .49. Correlations of scales measuring attributes of the self ranged from .34 to .55. Correlations of scales measuring psychiatric symptoms ranged from .52 to .74.

Construct validity of the self-inadequacy risk model. Although previous literature (Bruch, 1985; Johnson & Connors, 1987; Garner & Bemis, 1985) has suggested that the constellation of low self-esteem, fear of negative evaluation, and body dissatisfaction taps an underlying dimension of self-inadequacy in the ED population, few studies have directly examined the interdependence among these self attributes in a non-clinical population. To address the issues of construct validity and construct

Table 1

Intercorrelations Among All Variables in the Present Study (N=918)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. AGE	-												
2. BMI	.20	-											
3. FAW	.09	.26	-										
4. COT	-.13	-.05[a]	.01[a]	-									
5. ADT	-.06[a]	.03[a]	.08	.49	-								
6. BIT	.11	.37	.40	-.20	-.06[a]	-							
7. FNT	.00[a]	.00[a]	.23	-.10	-.05[a]	.34	-						
8. SET	-.06	-.09	-.23	.40	.24	-.44	-.55	-					
9. EAT	.10	.11	.44	-.19	-.07	.40	.25	-.33	-				
10. OCT	.18	.12	.27	-.31	-.09	.31	.40	-.53	.26	-			
11. DMT	.20	.13	.28	-.36	-.15	.36	.49	-.68	.32	.72	-		
12. BMT	.18	.12	.29	-.31	-.10	.29	.43	-.53	.29	.60	.74	-	
13. IMT	.06	.08	.28	-.35	-.12	.26	.31	-.43	.25	.52	.54	.62	-

Note. BMI = Body Mass Index; FAW = Family Attitudes Toward Weight and Appearance; COT = Family Cohesion; ADT = Family Adaptability; BIT = Body Dissatisfaction; FNT = Fear of Negative Evaluation; SET = Self-Esteem; EAT = EAT-26; OCT = Obsessive-Compulsive Behaviors; DMT = Depression; BMT = Biphasic Mood; IMT = Impulsivity.

a $p > .05$.

equivalence, structures of inter-dependence among self-esteem, fear of negative evaluation and body dissatisfaction for both the clinical and nonclinical samples were also compared in preliminary analyses.

Table 2 presents the results of factor analyses (using principal components method of factor extraction) on the measures of self attributes in both the clinical and nonclinical samples. The constellation of low self-esteem, high fear of negative evaluation and body dissatisfaction clearly reflects a global dimension of self-inadequacy in both samples. To evaluate further the similarity of factor structures derived from the two samples, two factor comparison analyses were conducted. First, loadings of this factor for each sample were intercorrelated (Tabachnick & Fidell, 1989). The correlation of factor loadings between the clinical and the high school samples was .99, suggesting similarity of the factor structures across samples. Another approach was to compute correlations between factor scores produced by different solutions (Gorsuch, 1983). In essence, this is achieved by (a) obtaining the factor-scoring matrix for each sample; (b) for each subject, computing two factor scores, one based on the patients' scoring matrix, one based on the students' matrix; and (c) correlating these factor scores; the higher the correlations, the more similar the factor structures. Results revealed that correlations between two factor

Table 2

Results of Factor Analyses on Attributes of Self-inadequacy for Clinic and High School Samples

	Factor Loadings	
	Patient Sample (n=74)	Student Sample (n=918)
Self-esteem	-0.90	-0.87
Fear of Negative Evaluation	0.75	0.80
Body-Dissatisfaction	0.73	0.74
Eigenvalue	1.92	1.96
Pct of Var	63.90	65.30
Alpha	0.65	0.71

scores derived from both samples also approached unity (above .99), substantiating the comparability of factor structures and construct equivalence across samples. Taken together, the results indicate that it is both theoretically meaningful and empirically sound to combine these attributes of the self to form a composite self-inadequacy construct in assessing risk for EDs among high school girls.

Multivariate Analyses of Variance

To evaluate the differentiating utility of this risk model, high school girls were first divided into high risk (HR), intermediate risk (IR), or normative control groups according to a composite self-inadequacy index (CSI). The CSI was created using the linear combination of the scale scores of self-esteem, fear of negative evaluation and body dissatisfaction. To match the scoring direction of the fear of negative evaluation and body dissatisfaction scales, scores on the self-esteem scale were reversed so that high scores would be negative. The CSI score was then converted to Z score. HR status was assigned to those who scored at or above the 92th percentile of the CSI distribution (n=81). IR status was assigned to those who scored at or above the 75th percentile but below the 92th percentile of the CSI distribution (n=116). The normative control status was assigned to those who scored below the 75th percentile of the CSI distribution (n=720). These cutoff criteria were chosen because epidemiological data indicated that up to

about 8% of young women may develop clinical EDs, and 15 to 20% may develop subclinical eating disturbances (Connors & Johnson, 1987; Heatherton & Baumeister, 1991). The patient sample was also included in the group comparisons to provide a clinical reference.

A one-way MANOVA was performed with group (HR, IR, Control, Patients) as the independent variable and scores on symptoms and family characteristics as dependent variables. A significant multivariate main effect of group was obtained, Wilks' criterion = .48, $F(24, 2798) = 34.51$, $p < .0001$. Univariate F tests revealed that the groups differed significantly on all dependent measures. Table 3 presents the means, standard deviations, and results of ANOVAs on all dependent variables. Information on age and body mass index (BMI) was also included for descriptive purposes. The three risk groups were significantly younger than the patient group. The HR and IR groups were slightly heavier than the control and patient groups.

Eating Disturbances. Post hoc comparisons revealed that on EAT-26, patients reported the most elevated scores of all groups. The HR group, however, reported significantly more eating symptoms than the IR and control groups. More importantly, the HR group was the only nonclinical group that scored, on average, above the clinical cutoff point (i.e., 20) on the EAT-26 scale, suggesting that eating abnormalities of clinical

Table 7

Means, (Standard Deviations), and ANOVA Results for Age, BMI, Symptom and Family Variables by Group: The Alternative Approach of Group Comparison

	Patients (n=74)	HR (n=82)	SO (n=74)	BO (n=143)	Control (n=618)	F	df
Age	27.67[a] (7.02)	15.00[b] (1.23)	14.61[b] (1.48)	14.83[b] (1.32)	14.57[b] (1.41)	543.28*	4, 983
BMI	19.57[b] (6.15)	21.28[a] (5.12)	19.03[b] (1.97)	22.43[a] (3.14)	19.49[b] (3.37)	21.63*	4, 955
EAT-26	32.25[a] (16.19)	20.38[b] (12.22)	10.97[cd] (11.02)	13.43[c] (8.61)	7.24[d] (7.22)	153.85*	4, 985
Depression	63.77[a] (9.50)	59.01[b] (8.36)	58.44[b] (8.74)	49.30[c] (7.66)	45.89[c] (7.52)	150.52*	4, 985
Biphasic Mood	59.72[a] (9.83)	58.03[a] (8.27)	56.73[a] (8.26)	49.25[b] (8.97)	46.70[b] (8.73)	74.07*	4, 984
Obsessive-compulsiveness	60.62[a] (11.97)	57.09[b] (8.92)	55.54[b] (9.46)	49.76[c] (7.92)	46.85[c] (8.48)	68.50*	4, 984
Impulsivity	55.27[a] (10.01)	55.75[a] (11.50)	55.89[a] (10.41)	51.00[b] (9.21)	47.72[b] (9.21)	27.51*	4, 985
Family Cohension	27.46[c] (8.43)	27.91[c] (8.87)	29.30[bc] (8.43)	31.49[ab] (8.15)	33.58[a] (8.44)	17.96*	4, 985
Family Adaptability	22.91[c] (7.14)	24.56[bc] (5.80)	24.85[b] (6.39)	27.16[a] (6.44)	26.90[a] (6.05)	10.64*	4, 985
Family Attitudes	24.06[a] (5.33)	23.48[a] (5.44)	19.58[b] (5.82)	22.15[a] (4.83)	18.41[b] (4.76)	45.85*	4, 973

Note. HR = High Risk; SO = Self-Only; BO = Body-Only. Means with different superscripts differ significantly at the .05 level. * $P < .0001$.

significance were present. The IR group also reported significantly more disordered eating behaviors than the control group. Their mean EAT-26 score, however, fell far below the clinical cutoff, suggesting eating disturbances less severe than those observed in a clinical population.

Psychiatric symptoms. Patients reported significantly more depressive and obsessive-compulsive symptoms than other groups. They also reported significantly more problems of mood lability and impulsivity than the control group. Of the three nonclinical groups, the HR group again displayed the most deviant score profile. They reported levels of mood lability and impulsivity which were comparable to those reported by patients. They also reported significantly more depressive symptoms than the IR group, and more symptoms on all psychiatric scales than the control group. The IR group also reported significantly more psychiatric symptoms than the control group.

Family Characteristics. The HR group displayed family characteristics that were comparable to those reported by patients. Both groups scored significantly lower on family cohesion, and higher on family concerns with weight and appearance than the IR and control groups. The patients and the HR subjects also described their families as less flexible than did the control group. The IR girls perceived their families as less cohesive and more concerned with weight and appearance than did the control subjects.

Given that girls in the HR and IR groups weighed more than subjects in the control and patient groups, analyses of covariance (ANCOVAs) using BMI as covariate were also conducted on the symptom and the family variables to determine whether differences among groups were associated with weight. Results of these analyses (see Appendix L) indicated that the pattern of findings did not change. These findings indicate that differences among groups in symptoms and family characteristics were not associated with weight.

In summary, these results document the differentiating utility of the composite self-inadequacy risk construct. In general, girls scoring high on the CSI reported more of the eating, psychiatric and family problems found in clinic cases. Of the three nonclinical groups, the HR group was the most disturbed. They reported more eating and psychiatric disturbances than the IR and control groups. Notably, the HR group was the only nonclinical group which scored, on average, above the clinical cutoff of the EAT-26 scale. HR girls also reported family characteristics closely resembling those described by clinic cases. They portrayed their families as less cohesive, less flexible, and more concerned with issues of weight and appearance.

Canonical Correlation Analyses

To examine the multivariate relational features among family characteristics, attributes of self-inadequacy, and

symptomatology, three sets of canonical analysis were conducted: (1) between family characteristics and attributes of self-inadequacy; (2) between family characteristics and symptomatology; and (3) between attributes of self-inadequacy and symptomatology.

Family characteristics and attributes of self-inadequacy. The canonical analysis of family characteristics and attributes of self-inadequacy indicated that two independent sources of covariation were required to describe the relations between these two sets of variables (see Table 4). The first root had a canonical correlation of .51 ($p < .0001$). Using only loadings of .40 or above, the first pair of canonical variates revealed that the combination of high family cohesion (.73), family adaptability (.40), and low family preoccupation with weight and appearance (-.68) was associated with high self-esteem (.88), low body dissatisfaction (-.80), and low fear of negative evaluation (-.45). The second root had a canonical correlation of .30 ($p < .0001$). Loadings on the second pair of canonical variates revealed that the preoccupation with weight and appearance (.73) in a family without other dysfunctions was associated with body dissatisfaction (.55) but not with other features of self-inadequacy. The redundancy index, an indicator of the proportion of variance in one set of variables that is predictable from the other set, indicated that the three family measures as a set

Table 4

Canonical Correlation Analysis of Family characteristics and Attributes of Self-inadequacy

	Root 1		Root 2	
	Coefficient	Correlations	Coefficient	Correlation
Measures of Family Features				
Family Cohesion	0.67	0.73	0.51	0.65
Family Adaptability	0.12	0.40	0.27	0.58
Family Attitudes	-0.69	-0.68	0.70	0.73
Measures of Self Features				
Self-esteem	0.72	0.88	0.13	0.34
Body-dissatisfaction	-0.52	-0.80	0.79	0.55
Fear of Negative Evaluation	0.12	-0.45	0.63	0.34
Canonical R_c	0.51		0.30	
Canonical R^2	0.26		0.09	
F	43.12		21.68	
df	9		4	
P	0.0001		0.0001	
Redundancy Indexes	15.61[a]			
	13.89[b]			

a Variance of self-inadequacy attributes predicted by family characteristics.
b Variance of family characteristics predicted by self-inadequacy attributes.

explained 15.61% of the total variance in attributes of self-inadequacy.

To summarize, these findings indicated that girls who described their families as high on cohesion, adaptability, and low on preoccupation with weight and appearance tended to report a healthy self-profile characterized by high self-esteem, low sensitivity to others' disapproval and low body dissatisfaction. Girls who described their families as preoccupied with issues of weight and appearance but without other relationship problems tended to report body dissatisfaction but not other attributes of self-inadequacy.

Family Characteristics and Symptomatology. The canonical analysis conducted between family characteristics and symptomatology also resulted in two significant and interpretable roots (see Table 5). The first root had a canonical correlation of .59 ($p < .0001$). Loadings on this pair of canonical variates revealed that the combination of high family preoccupation with weight and appearance (.81) and low family cohesion (-.58) was associated with elevated symptoms of eating disturbances (.80), depression (.73), impulsivity (.73), biphasic mood (.69), and obsessive-compulsiveness (.67). The second root had a canonical correlation of .25 ($p < .0001$). Loadings on this pair of canonical variates revealed that preoccupation with weight and appearance (.59) in cohesive families (.81) was associated only with circumscribed eating disturbances

Table 5

Canonical Correlation Analysis of Family Characteristics and Eating/Psychiatric Symptoms

	Root 1		Root 2	
	Coefficient	Correlations	Coefficient	Correlation
Measures of Family Features				
Family Cohesion	-0.60	-0.58	0.85	0.81
Family Adaptability	0.03	-0.20	-0.10	0.37
Family Attitudes	0.81	0.81	0.59	0.59
Measures of Eating and Psychiatric Symptoms				
EAT-26	0.58	0.80	0.86	0.59
Obsessive-Compulsiveness	0.13	0.67	-0.06	-0.38
Depression	0.20	0.73	-0.63	-0.47
Biphasic Mood	0.07	0.69	0.27	-0.29
Impulsivity	0.36	0.73	-0.51	-0.49
Canonical R_2	0.59		0.25	
Canonical R^2	0.35		0.06	
F	32.70		7.73	
df	15		8	
P	0.0001		0.0001	
Redundancy Indexes	19.67[a]			
	14.33[b]			

a Variance of Symptomatology predicted by Family characteristics.
b Variance of Family characteristics predicted by Symptomatology.

(.59). The redundancy index indicated that the three family variables as a set explained 19.67% of the total variance in eating and psychiatric symptoms.

To summarize, these findings indicated that in families without other dysfunctions, concerns about weight and appearance were associated mainly with circumscribed eating problems. The same concerns in families with other relationship problems, however, were associated with a mutli-symptom profile characterized by both elevated eating disturbances and psychiatric symptoms.

Self-inadequacy Attributes and Symptomatology. Canonical analysis of self-inadequacy attributes and symptomatology also resulted in two pairs of significant roots (see Table 6). The first root had a canonical correlation of .71 ($p < .0001$). Loadings on this pair of canonical variates indicated that the constellation of low self-esteem (-.96), high fear of negative evaluation (.72), and high body dissatisfaction (.59) was associated with a poly-symptomatic profile characteristized by depression (.97), mood lability (.77), obsessionality (.76), impulsivity (.63), and eating abnormalities (.53). The second root had a canonical correlation of .29 ($p < .0001$). Loadings on this pair of variates indicated that body-dissatisfaction (.80) alone without other self-inadequacy features was associated only with circumscribed eating symptoms (.84). The redundancy index revealed that

Table 6

Canonical Correlation Analysis of Attributes of Self-inadequacy and Eating/Psychiatric Symptoms

	Root 1		Root 2	
	Coefficient	Correlations	Coefficient	Correlation
Measures of Self Features				
Self-esteem	-0.75	-0.96	0.68	0.19
Body-Dissatisfaction	0.17	0.59	1.09	0.80
Fear of negative evaluation	0.25	0.72	0.02	0.02
Measures of Eating and Psychiatric Symptoms				
EAT-26	0.20	0.53	1.02	0.84
Obsessive-Compulsiveness	0.08	0.76	0.12	-0.05
Depression	0.76	0.97	-0.61	-0.22
Biphasic Mood	0.04	0.77	-0.07	-0.12
Impulsivity	0.09	0.63	0.02	-0.03
Canonical R_2	0.71		0.30	
Canonical R^2	0.51		0.09	
F	56.71		11.37	
df	15		8	
P	0.0001		0.0001	
Redundancy Indexes	32.43[a]			
	29.84[b]			

a Variance of symptomatology predicted by self-inadequacy attributes.
b Variance of self-inadequacy attributes predicted by symptomatology.

attributes of self-inadequacy as a set accounted for 32.43% of the total variance in eating and psychiatric disturbances.

These findings indicated that girls who reported body dissatisfaction but not other attributes of self-inadequacy displayed circumscribed eating disturbances only. However, girls who displayed a self-profile of low self-esteem, high fear of negative evaluation and body dissatisfaction (corresponding to the hypothesized high risk profile defined in the present study) reported a symptom profile characterized by both elevated eating disturbances and psychiatric symptoms.

Collectively, results of canonical analyses suggest that family preoccupation with weight and appearance alone is associated with body-image deficit and circumscribed eating disturbances in adolescent girls. The combination of these preoccupations with other family dysfunctions, however, is associated with: (1) a vulnerable self-profile characterized by both body-image deficit and general self-image deficit; and (2) a multi-symptom profile characterized by both elevated eating and psychiatric symptoms, a constellation often observed in clinical cases.

An Alternative Approach to Risk Group Classification

The formation of the CSI assumed a unitary dimension of self-inadequacy which was affirmed by factor analyses. Results from canonical analyses, however, suggest that the

global construct of self-inadequacy can also be meaningfully conceptualized as a combination of two closely related components: a body-image deficit and a general self-image deficit. Based on these observations, the utility of a two-dimensional approach of risk group classification was also examined. This approach reclassified the high school sample into four unique subgroups according to a two-dimensional conceptualization of the self-inadequacy construct. The first dimension, labelled here as self-image deficit, was indexed by the composite score of self-esteem and fear of negative evaluation. The second dimension, labelled here as body-image deficit, was indexed by the score of body dissatisfaction alone. Girls scoring at or above the 70th percentile cutoff on both self-image deficit and body-image deficit were assigned to the high risk (HR) group (n=82)[1]. Girls scoring above the cutoff point on body-image deficit but below the cutoff on self-image deficit were assigned to the Body-deficit Only (BO) group (n=144). Girls scoring at or above the 70th percentile on self-image deficit but below the cutoff on body-image deficit were assigned to the Self-deficit Only (SO) group (n=63). Girls scoring below the cutoffs on both body-image deficit and self-image deficit were assigned to the normative control group (n=618).

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[1] This cutoff point was chosen so that approximately 8% of the high school girls would be classified as at-risk. It is of interest to note that 75 (92%) of these 82 HR subjects were also classified as at-risk according to the CSI.

A one-way MANOVA was run using group (HR, SO, BO, CONTROL, Patient) as the independent variable and the scores for symptoms and family characteristics as dependent variables. A significant multivariate main effect of group was obtained, Wilks' criterion = .43, $F(32, 3512) = 28.14$, $p < .0001$. Univariate F tests revealed that the groups differed significantly on all dependent measures. Table 7 presents the means, standard deviations, and results of ANOVAs on age, BMI, symptom and family variables.

Eating Symptoms. Post hoc tests revealed that on EAT-26, the patient group again was the most disturbed group. Among all nonclinical groups, the HR girls reported the most severe eating disturbances. The HR group was the only nonclinical group that scored, on average, above the clinical cutoff on the EAT-26 scale. The BO group also produced reliably higher EAT-26 scores than the Controls, but their mean EAT-26 scores suggested eating disturbances of a less severe nature. The SO group reported a level of eating symptoms comparable to that of the Controls.

Psychiatric disturbances. The patients again displayed the most deviant psychiatric profile. The HR and SO groups were the most disturbed of the nonclinical groups. Both groups reported levels of mood lability and impulsivity which were comparable to those reported by ED patients. They also reported significantly more symptoms on all psychiatric scales than the BO and Control groups. The BO

Table 7

Means, (Standard Deviations), and ANOVA Results for Age, BMI, Symptom and Family Variables by Group: The Alternative Approach of Group Comparison

	Patients (n=74)	HR (n=82)	SO (n=74)	BO (n=143)	Control (n=618)	F	df
Age	27.67[a] (7.02)	15.00[b] (1.23)	14.61[b] (1.48)	14.83[b] (1.32)	14.57[b] (1.41)	543.28*	4, 983
BMI	19.57[b] (6.15)	21.28[a] (5.12)	19.03[b] (1.97)	22.43[a] (3.14)	19.49[b] (3.37)	21.63*	4, 955
EAT-26	32.25[a] (16.19)	20.38[b] (12.22)	10.97[cd] (11.02)	13.43[c] (8.61)	7.24[d] (7.22)	153.85*	4, 985
Depression	63.77[a] (9.50)	59.01[b] (8.36)	58.44[b] (8.74)	49.30[c] (7.66)	45.89[c] (7.52)	150.52*	4, 985
Biphasic Mood	59.72[a] (9.83)	58.03[a] (8.27)	56.73[a] (8.26)	49.25[b] (8.97)	46.70[b] (8.73)	74.07*	4, 984
Obsessive-compulsiveness	60.62[a] (11.97)	57.09[b] (8.92)	55.54[b] (9.46)	49.76[c] (7.92)	46.85[c] (8.48)	68.50*	4, 984
Impulsivity	55.27[a] (10.01)	55.75[a] (11.50)	55.89[a] (10.41)	51.00[b] (9.21)	47.72[b] (9.21)	27.51*	4, 985
Family Cohension	27.46[c] (8.43)	27.91[c] (8.87)	29.30[bc] (8.43)	31.49[ab] (8.15)	33.58[a] (8.44)	17.96*	4, 985
Family Adaptability	22.91[c] (7.14)	24.56[bc] (5.80)	24.85[b] (6.39)	27.16[a] (6.44)	26.90[a] (6.05)	10.64*	4, 985
Family Attitudes	24.06[a] (5.33)	23.48[a] (5.44)	19.58[b] (5.82)	22.15[a] (4.83)	18.41[b] (4.76)	45.85*	4, 973

Note. HR = High Risk; SO = Self-Only; BO = Body-Only. Means with different superscripts differ significantly at the .05 level. * P < .0001.

group displayed levels of psychiatric symptoms similar to those of the Controls.

Family Characteristics. The HR group also reported family characteristics comparable to those reported by ED patients. Both groups scored significantly higher on family concerns about weight and appearance than the SO and Control groups, and scored lower on family cohesion and adaptability than the BO and Control groups. Like the patient and HR groups, the BO group also described their families as more concerned about weight and appearance than did the SO and Control groups. However, their families resembled the Controls on cohesion and adaptability. The SO girls described their families as significantly less cohesive and adaptive than the Controls, and also less adaptive than the BO group. However, their families resembled the Controls on family concerns about weight and appearance.

In summary, these analyses revealed that girls who displayed both body-image deficit and general self-image deficit reported more of the eating, psychiatric, and family problems found in ED patients. The SO girls resembled the HR girls in their psychiatric profiles and in their description of general family dysfunction. However, they described their families as less concerned with weight and appearance and reported significantly less eating disturbances. The BO girls reported mild eating problems and described their families as concerned with weight and

appearance as the patient and HR groups. However, they displayed healthier psychiatric and family profiles than the HR and SO girls.

Structural Equation Analyses

Structural equation analyses using the EQS computer program (Bentler, 1989) were conducted to test the path models proposed in the present study (see Figure 1, p.34). The correlation matrix and the associated standard deviations of all variables in the model were used as input to the EQS program (see Table 8). Scores on self-esteem were reversed to match the scoring direction of the fear of negative evaluation and body dissatisfaction scales. The data were analysed using maximum likelihood procedures to estimate the parameters of the model. Once maximum likelihood estimates of the parameters of the model were computed, the feasibility of the proposed model was tested by comparing a data-generated moment matrix with a model-implied matrix. Typically, non-significant chi-square values indicate good model fit. However, large samples will always have strong statistical power, thereby increasing the probability of detecting trivial differences (Tanaka, 1987). As an alternative to the chi-square goodness-of-fit test, other comparative fit indices have been proposed in recent years. The EQS program provides two such indices: the Normal Fit Index (NFI) and the Comparative Fit Index (CFI). Both take on values between zero and one, with increasing

Table 8

Standard Deviations (SDs) and Intercorrelations Among Variables in the Path Model

	FAW	COT	ADT	BIT	FNT	SET	EAT	OCT	DMT	BMT	IMT
FAW	-										
COT	.01	-									
ADT	.08	.49	-								
BIT	.40	-.20	-.06	-							
FNT	.23	-.10	-.05	.34	-						
SET*	.23	-.40	-.24	.44	.55	-					
EAT	.44	-.19	-.07	.40	.25	.33	-				
OCT	.27	-.31	-.09	.31	.40	.53	.26	-			
DMT	.28	-.36	-.15	.36	.49	.68	.32	.72	-		
BMT	.29	-.31	-.10	.29	.43	.53	.29	.60	.74	-	
IMT	.28	-.35	-.12	.26	.31	.43	.25	.52	.54	.62	-
SDs	5.24	8.64	6.17	8.76	9.57	7.84	9.30	6.19	8.90	6.06	6.89

Note. FAW = Family Attitudes Toward Weight and Appearance; COT = Family Cohesion; ADT = Family Adaptability; BIT = Body Dissatisfaction; FNT = Fear of Negative Evaluation; SET = Self-Esteem; EAT = EAT-26; OCT = Obsessive-Compulsive Behaviors; DMT = Depression; BMT = Biphasic Mood; IMT = Impulsivity.

* SET scale score was reversed to match the scoring direction of FNT and BIT.

values reflecting better data-model fit. The recently developed CFI has the advantage of assessing model fit at all sample sizes, and avoids the underestimation of fit sometimes found in true models with NFI. Bentler (1989) indicated that models with associated NFI or CFI values of .90 or above indicate acceptable explanations of the data.

To take full advantage of the large sample size available in this study, the proposed models were first tested using a random half of the student sample. The model that emerged was then tested and replicated in the second sample half. For purposes of parsimony, the results for the total sample are described because they provide the most stable parameter estimates. Initial tests of the models indicated that: (1) family functioning had no direct effect on psychiatric symptoms; and (2) eating abnormalities and psychiatric disturbances were not causally related to each other. As a result, these non-significant paths were eliminated in the final model.

Table 9 presents the factor loadings of the measured variables on the latent variables and their residual variances in the final model. All factor loadings were significant, indicating that all measured variables were representative of the construct with which they were linked. Figure 2 presents the significant regression paths in the final model. Residual variances (in small circles) are also included. The structural model is represented with arrows

Table 9

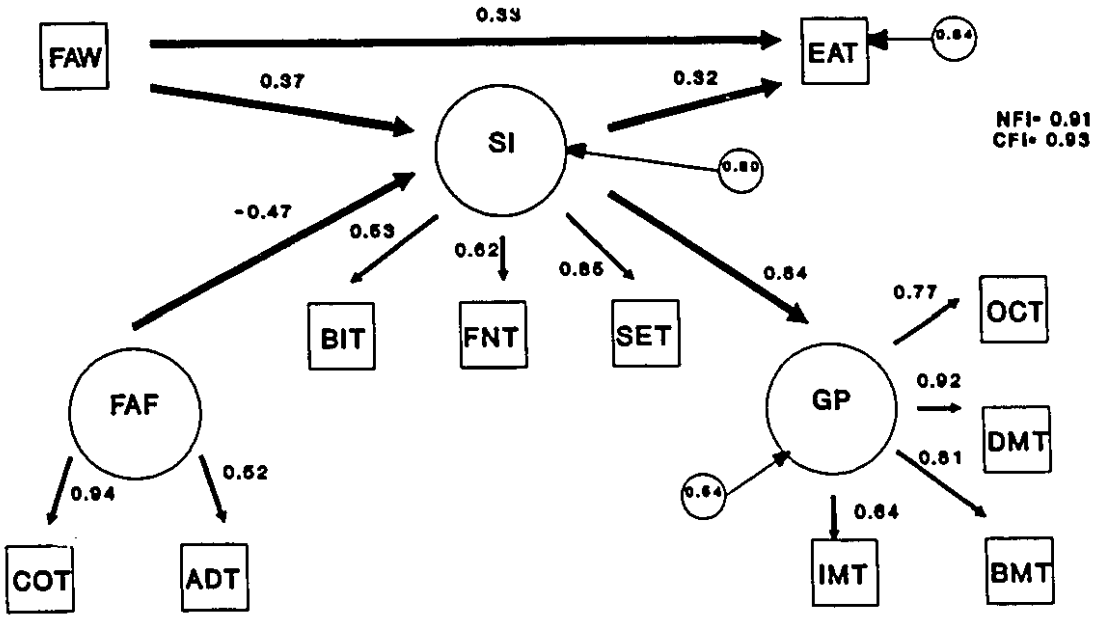
Standardized Measurement Model Parameter

Observed Variables		Latent Variables	Measurement Model Parameters: Factor Loading	Measurement Model Parameters: Residual Variance
Independent Variables				
V1	FAW		1.00	.00
V2	COT		.94*	.34
V3	ADT	Family Functioning	.52	.85
Dependent Variables				
V4	BIT		.53*	.84
V5	FNT		.62	.78
V6	SET	Self-Inadequacy	.85	.53
V7	EAT		1.00	.84
V8	OCT		.77*	.63
V9	DMT		.92	.40
V10	BMT		.81	.59
V11	IMT	General Psychopathology	.64	.76

Note. FAW = Family Attitudes Toward Weight and Appearance; COT = Family Cohesion; ADT = Family Adaptability; BIT = Body Dissatisfaction; FNT = Fear of Negative Evaluation; SET = Self-Esteem; EAT = EAT-26; OCT = Obsessive-Compulsive Behaviors; DMT = Depression; BMT = Biphasic Mood; IMT = Impulsivity.
All factor loadings are significant at $p < .001$. * Factor loading with significance level not indicated were fixed in the analysis for identification purposes.

Figure 2

Significant Regression Paths in the Proposed Path Model.



Note. Regression coefficients are standardized and all are significant at .001 level. Residual variances are in small circles.

linking the variables. All direct and indirect path coefficients (standardized) in this model were significant. The model yielded X^2 (41, N=918) = 372.06, $p < .001$, NFI = .91, and CFI = .92. As mentioned earlier, a NFI or CFI of .90 or better indicates good fit between the model and the data even when the chi-square goodness-of-fit test suggests otherwise. In other words, these results suggest that the proposed model is an acceptable explanation of the data.

Table 10 presents the summary of direct, indirect, and total effects in the final model. Both family attitudes toward weight and appearance and family functioning had direct effects on the multi-faceted construct of self-inadequacy (.37 and -.47, respectively). Girls who described their families as more concerned with weight and appearance and less cohesive and flexible reported lower self-esteem, high fear of negative evaluation and body dissatisfaction. This global feeling of self-inadequacy, in turn, had direct effects on both eating (.32) and general psychopathology (.84). Girls who felt more inadequate about themselves reported more eating and psychiatric disturbances. Family attitudes toward weight and appearance also had a direct effect on eating disturbances (.33), and indirect effects mediated by self-inadequacy on both eating (.11) and general psychopathology (.31). Family functioning had indirect effects mediated by self-inadequacy on both eating (-.15) and psychopathology (-.39).

Table 10

Direct, Indirect, and Total Effects in the Final Model

Variables	Effects		
	Direct	Indirect	Total
		Self-Inadequacy	
Family Attitudes Toward Weight and Appearance	.37	-	.37
Family Functioning	-.47	-	-.47
		Eating Disturbances	
Family Attitudes Toward Weight and Appearance	.33	.11	.44
Family Functioning	-	-.15	-.15
Self-Inadequacy	.32	-	.32
		General Psychopathology	
Family Attitudes Toward Weight and Appearance	-	.31	.31
Family Functioning	-	-.39	-.39
Self-Inadequacy	.84	-	.84

Note. All direct and indirect effects are significant at .001 level.

In summary, results indicated that family preoccupation with weight and appearance has direct effects on both self-inadequacy and eating disturbances; an indirect effect mediated by self-inadequacy on psychiatric disturbances. General family dysfunction has a direct effect on self-inadequacy; and an indirect effect mediated by self-inadequacy on psychiatric disturbances. Self-inadequacy has direct effects on both eating and psychiatric disturbances. This pattern of findings suggests that the combination of family preoccupation with weight and appearance and general family dysfunction contribute directly to the development of a vulnerable self-profile characterized by low self-esteem, high fear of negative evaluation and body dissatisfaction in adolescent girls. This vulnerable self-profile, in turn, increases their likelihood to develop eating and psychiatric disturbances.

An Alternative Path Model

Results of the alternative risk group comparisons show that the two-dimensional conceptualization of self-inadequacy represents a more informative approach in understanding the differential roles of body-image deficit and general self-image deficit in the development of eating and psychiatric disturbances. Based on these observations, the present study also tested an alternative path model which partitioned the unitary construct of self-inadequacy into body-image deficit and general self-image deficit (see

Figure 3). In general, this model hypothesizes that the family environment contributes to the development of eating and psychiatric disturbances in young girls through two different pathways. On one hand, family preoccupation with weight and appearance will have a direct effect on body dissatisfaction, and both direct and indirect effects mediated by body dissatisfaction on eating disturbances. On the other hand, dysfunctional family relationships will have a direct impact on self-image deficit, and an indirect effect mediated by self-image deficit on general psychopathology. A causal pathway emanating from body-image deficit to self-image deficit is also postulated.

Initial tests of the model using two random halves of the student sample revealed that body-image deficit in itself had no direct bearing on general psychopathology. This path was eliminated in the final model which was tested using the total sample.

Table 11 presents the factor loadings of the measured variables on the latent variables and their residual variances in the alternative model. All factor loadings were significant. Figure 4 presents the significant regression paths in the alternative path model. All direct and indirect path coefficients in this model were significant. The model yielded X^2 (40, N=918) = 353.47, $p < .001$, NFI = .92, and CFI = .92, indicating that the revised model provides an acceptable alternative explanation of the

Figure 3

The Path Diagram of the Alternative Path Model.

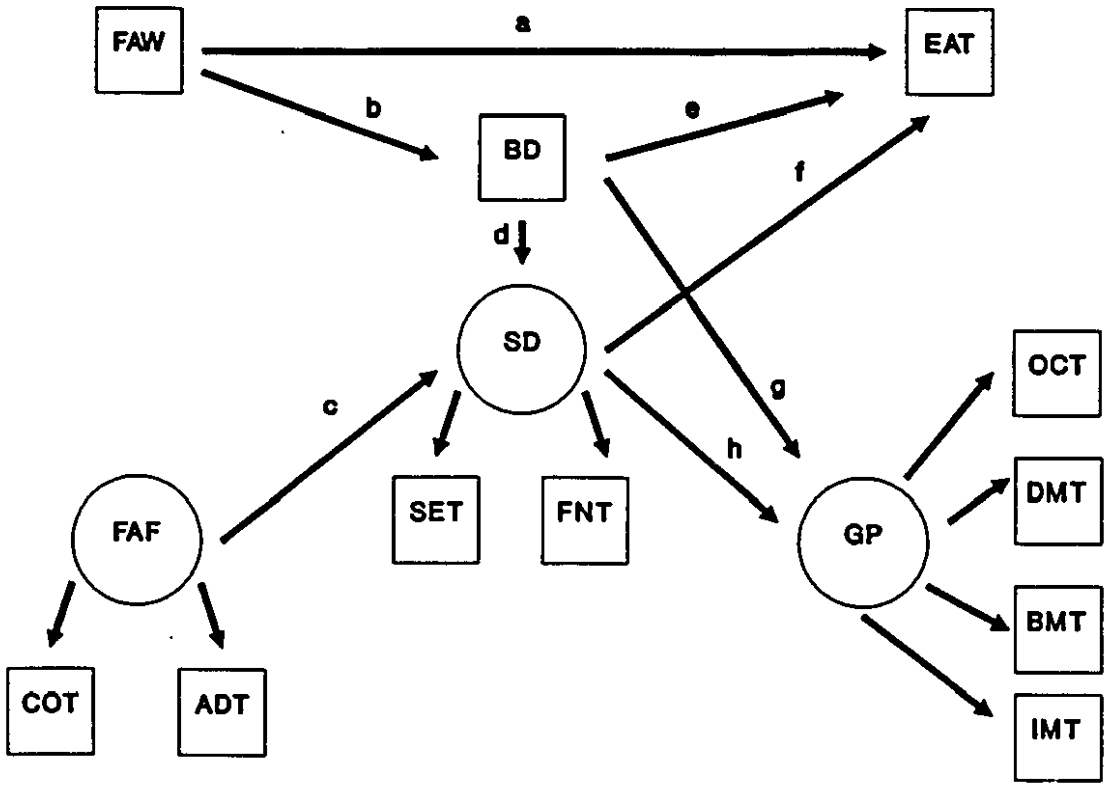


Table 11

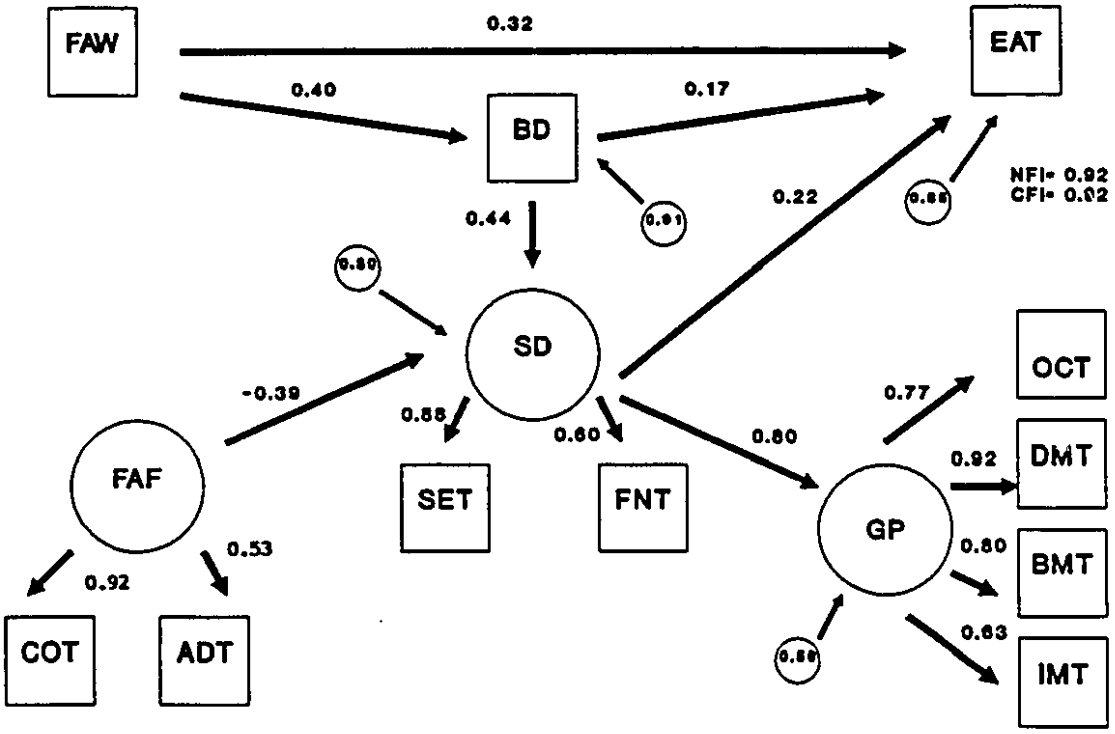
Standardized Measurement Model Parameters for the Alternative Path Model

Observed Variables		Latent Variables	Measurement Model Parameters: Factor Loading	Residual Variance
Independent Variables				
V1	FAW		1.00	.00
V2	COT		.92[a]	.39
V3	ADT	Family Functioning	.53	.85
Dependent Variables				
V4	BD		1.00	.91
V5	FNT		.60	.79
V6	SET	Self-image Deficit	.88	.49
V7	EAT		1.00	.85
V8	OCT		.77[a]	.64
V9	DMT		.92	.40
V10	BMT		.80	.60
V11	IMT	General Psychopathology	.63	.78

Note. FAW = Family Attitudes Toward Weight and Appearance; COT = Family Cohesion; ADT = Family Adaptability; BD = Body-image Deficit; FNT = Fear of Negative Evaluation; SET = Self-Esteem; EAT = EAT-26; OCT = Obsessive-Compulsive Behaviors; DMT = Depression; BMT = Biphasic Mood; IMT = Impulsivity.
All factor loadings are significant at .001 level. [a] Factor loading with significance level not indicated were fixed in the analysis for identification purposes.

Figure 4

Significant Regression Paths in the Alternative Path Model.



Note. Regression coefficients are standardized and all are significant at .001 level. Residual variances are in small circles.

data in this sample.

Table 12 presents the summary of direct, indirect, and total effects in the alternative model. Family preoccupation with weight and appearance had direct effects on both body-image deficit (.40) and eating disturbances (.32). Girls who described their families as more concerned with weight and appearance felt more dissatisfied with their body and reported more eating disturbances. Family preoccupation with weight and appearance also had indirect effects, mediated by body-image deficit and/or self-image deficits, on eating disturbances (.11), self-image deficit (.18), and general psychopathology (.14). Family functioning had a direct effect on self-image deficit (-.39), and indirect effects mediated by self-image deficit on eating (-.09) and general psychopathology (-.32). Girls described their families as more dysfunctional felt more inadequate about themselves in general and reported more eating and psychiatric symptoms. Body-image deficit had direct effects on both eating disturbances (.17) and self-image deficit (.44) , and indirect effects mediated by self-image deficit on eating (.10) and general psychopathology (.36). Self-image deficit had direct effects on both eating (.22) and general psychopathology (.80).

In summary, results of the alternative path model delineate the different roles played by two sources of family influence and two components of self-inadequacy in

Table 12

Direct, Indirect, and Total Effects in the Alternative Path Model

Variables	Effects		
	Direct	Indirect	Total
		Body-image Deficit	
Family Attitudes Toward Weight and Appearance	.40	-	.40
		Self-image Deficit	
Body-image Deficit	.44	-	.44
Family Attitudes Toward Weight and Appearance	-	.18	.18
Family Functioning	-.39	-	-.39
		Eating Disturbances	
Family Attitudes Toward Weight and Appearance	.32	.11	.43
Family Functioning	-	-.09	-.09
Body-image Deficit	.17	.10	.27
Self-image Deficit	.22	-	.22
		General Psychopathology	
Family Attitudes Toward Weight and Appearance	-	.14	.14
Family Functioning	-	-.32	-.32
Body-image Deficit	-	.36	.36
Self-image Deficit	.80	-	.80

Note. All direct and indirect effects are significant at .001 level.

the development of eating and psychiatric symptomatology in high school girls. Family preoccupation with weight had direct effects on body-image dissatisfaction and disordered eating behaviors. Body-image dissatisfaction had direct effects on eating disturbances and self-image deficit, and an indirect effect mediated by self-image deficit on psychiatric disturbances. Dysfunctional family relationships did not contribute directly to eating and psychiatric disturbances. However, it had a direct effect on general self-image deficit, and an indirect effect mediated by self-image problems on eating and psychiatric disturbances.

DISCUSSION

The major purpose of the present study was to develop a multi-faceted self-inadequacy risk model to identify young girls at risk for eating disorders. Results of factor analyses of the scale scores of self-esteem, fear of negative evaluation, and body dissatisfaction provide empirical support for the validity of self-inadequacy as a risk construct. Self-inadequacy was characterized by low self-esteem, high fear of negative evaluation and body dissatisfaction in both the clinical and nonclinical samples. This pattern of association was consistent with previous findings which indicate that the self-esteem of women is integrally interwoven with body satisfaction (Grant & Fodor, 1986; Hartley, 1989; Powers & Erickson, 1986) and with others' opinions and evaluations (Gilligan, 1982; Heatherton & Baumeister, 1991; Streigel-Moore et al., 1986).

More importantly, results of factor comparison procedures revealed that the factors derived from the clinical and nonclinical samples were similar. Since the student and patient samples in this study differed in clinical status and age, the invariance of factor structures across these two samples suggests that self-inadequacy is a primary psychological feature in women who are clinically disordered and in girls who are at risk for eating disorders. In addition, the similarity of the factors in the adolescent and adult samples suggests construct

stability across life stages. Both indications attest to the utility of self-inadequacy as a psychological construct in assessing risk for eating disorders among nonclinical adolescent girls.

The results also provide support for the utility of the self-inadequacy risk model. Girls scoring high on the composite self-inadequacy risk index reported more of the eating, psychiatric and family problems found among eating disordered patients. Analyses of covariance using BMI as covariate indicated that these findings could not be attributed to differences in weight between groups.

Of the three student groups, the HR group was consistently the most disturbed. The HR group reported significantly more eating problems than the IR and control groups. More significantly, the HR group was the only "nonclinical" group that scored, on average, above the clinical cutoff point on the EAT-26 scale. This finding points to the presence of eating pathology of clinical significance. Members of the IR group also reported more eating disturbances than members of the control group. Their levels of eating disturbance, however, generally fell below the clinical cutoff point.

The HR group reported more psychiatric symptoms, particularly disturbances of mood, than the IR and the control groups. The coexistence of clinically significant eating pathology and other psychiatric symptoms, as noted

earlier, has frequently been observed among high risk girls who later develop clinical eating disorders (Patton et al., 1990; Schleimer, 1983). Moreover, family characteristics frequently reported among patients of eating disorders were also reported by members of the HR group. Relative to the IR and control groups, they portrayed their families as less cohesive, less adaptive, and more concerned with issues of weight and appearance. These results provide empirical support for the contention of Garner and Bemis (1985) that the constellation of these "self-concept deficits" constitutes a unique self-profile, which in its extreme form, predisposes girls to eating disorders.

Results of canonical analyses illuminate the multivariate relations among family characteristics, attributes of self-inadequacy and symptomatology that are not apparent in univariate analyses. Canonical analysis of family characteristics and attributes of the self in the present study indicated that the combination of high family cohesion, adaptability, and low family preoccupation with weight and appearance was associated with a positive self-profile characterized by high self-esteem, low sensitivity to other's disapproval, and low body dissatisfaction. Preoccupation with weight and appearance in otherwise non-problematic families was associated with body dissatisfaction but not with other self-concept problems. This pattern of results is in line with the general belief

that positive family relationships and values are crucial to the development of a positive self-concept in adolescents (Cooper, Holman, & Braithwaite, 1983; Coopersmith, 1967; Loeb, Horst, Horton, 1980; Rosenberg, 1979). What is more important to infer from these data is that family preoccupation with weight alone is not sufficient for the development of the pervasive sense of self inadequacy that is often observed among patients of eating disorders.

Canonical analysis of family characteristics and symptomatology indicated that family preoccupation with weight and appearance in families without other relationship problems was associated with circumscribed eating disturbances. The same preoccupation in families with other dysfunctional family characteristics, however, was associated with a multi-symptom profile of eating and other psychiatric disturbances. This pattern of findings provides empirical support for the view that both "eating domain-specific" and general family functioning variables are required for the development of the more severe forms of eating pathology (Costanzo & Woody, 1985; Garfinkel & Garner, 1982; Rodin et al., 1990).

Canonical analysis of attributes of the self and symptomatology indicated that body dissatisfaction alone was associated with circumscribed eating disturbances. The combination of body dissatisfaction with low self-esteem and high fear of negative evaluation, however, was associated

with a multi-symptom profile of eating and other psychiatric disturbances. This pattern of results provides empirical support for the "two-component" conceptualization of eating pathology proposed by Polivy and Herman (1987). According to these authors, there are two components in the pathology exhibited by patients with eating disorders: one associated with specific concerns about body shape, appearance, and eating; the other reflecting "ego deficit" (p.638) or general disturbances of the self. Polivy and Herman argue that most women with concerns about body shape, appearance and eating will not develop clinical eating disorders. It is only when these concerns are combined with other disturbances of the self that clinical eating syndromes are more likely to appear.

Collectively, the results of the foregoing canonical analyses suggest that the global construct of self-inadequacy derived in the present study can also be meaningfully conceptualized as a combination of two interrelated components: body-image deficit and general self-image deficit. This formulation is congruent with that of others' (c.f., Krueger, 1989; Sugarman, 1991) who view the individual's general sense of self as a mix of at least two basic components: the "body self" and the "psychological self". More importantly, different combinations of these two components of self-inadequacy were found to be associated with different family and symptom

profiles. Based on these observations, the utility of an alternative risk group classification which divided the high school girls into four unique subgroups, displaying different combinations of body- and self- image problems, was also examined.

Results indicated that of the four student groups, only girls displaying both body- and self- image problems (the HR group) reported clinically significant eating pathology, elevated psychiatric symptoms, and family characteristics closely resembling those described by clinic cases. Girls displaying body-image problems only (the BO group) described their families being as concerned with weight as were the families of the patient and HR groups. However, they reported milder eating disturbances. Moreover, they resembled the normative controls in general family functioning and psychiatric symptom profiles. Girls displaying self-image problems only (the SO group) resembled the HR girls in general family dysfunction and in psychiatric symptom profiles. However, they described their families as less concerned with weight and they reported fewer eating problems.

This pattern of findings underlines the coexistence of body-image and self-image problems as a reliable indicator of risk for clinical eating disorders. The BO girls came from families with heightened concerns with weight. They experienced body dissatisfaction and reported mild eating

problems. However, their overall family and symptom profiles resembled more closely those referred to as "zealous dieters" (Garner et al., 1984; Klemchuk, Hutchinson, & Frank, 1990; Laessle et al., 1989) than patients with eating disorders. The SO girls came from families characterized by dysfunctional relationships. They experienced general self-esteem problems and reported similar levels of psychiatric symptoms as the HR girls. Their overall family and symptom profiles suggested that they were vulnerable to psychopathology in general.

This interpretation is consistent with the contention that general family dysfunction and self-esteem deficits are fundamental to the development of a number of mental disorders, and may best be regarded as a dimension of general vulnerability to psychopathology (Albee, 1985; Harder et al., 1984; Koenig et al., 1984; Polivy & Herman, 1987). Polivy and Herman (1987) propose that this general vulnerability is likely to be shared by individuals at risk for eating disorders and those who are susceptible to other psychiatric disorders, and that the expression of this psychiatric risk in different clinical forms is determined by specific factors. The present results suggest that family preoccupation with weight and body dissatisfaction represent important "domain-specific" variables within the family and the individual that channel this general vulnerability into clinical eating disorders.

It is of interest to note that 92% of the HR girls identified by the two-dimensional risk group classification were also classified as at-risk using the unidimensional approach. In other words, both methods identified essentially the same risk group of girls. If our goal is only to identify HR girls for further investigation, both approaches appear to be equally effective. The advantages of the unidimensional approach are that it provides a parsimonious conceptual framework and a convenient risk index for eating disorders. Its disadvantage is that it may obscure clinically meaningful subgroup differences. The distinct family and symptom profiles of the HR, BO, and SO girls generated by the two-dimensional risk approach attest to its advantage in this respect. Moreover, the finding that there is an extensive overlap between the HR and SO girls in general family dysfunction and psychiatric disturbances also underscores the importance of including distinct deviant contrast groups in such comparisons. Without the SO group, for example, one might wrongly conclude that the differences among the HR, BO and normative control groups in general family dysfunction and psychiatric disturbances represent differences specific to the development of eating disorders.

Regardless of type of risk group classification, our findings provide empirical support for the constellation of low self-esteem, high fear of negative evaluation and body

dissatisfaction as a valid and promising personality risk profile for eating disorders. Moreover, the fact that assessment of the profile requires only three brief and simple but well-validated measures is a particular advantage (1) when several instruments need to be used and the time available for the screening of high risk candidates is limited; and (2) when the targeted girls are too young to understand more complex psychological statements.

As noted earlier, however, risk as an actuarial construct tells us little about the underlying mechanisms involved. Thus, the present study also aimed to develop a parsimonious path model that can help us to understand the causal links among family characteristics, attributes of self-inadequacy and symptomatology. We first tested a model which views self-inadequacy as a unitary construct (see Figure 1, p.37). Results indicated that heightened family concerns about weight and general family dysfunction contribute directly to the development of a vulnerable self-structure characterized by low self-esteem, high fear of negative evaluation and body dissatisfaction. Family preoccupation with weight also had a direct effect on eating symptoms, and an indirect effect mediated by self-inadequacy on both eating and psychiatric disturbances. General family dysfunction had no direct effect on psychiatric disturbances. Its impact on eating and psychiatric symptoms were mediated by self-inadequacy. Smets and Hartup (1988)

offer the view that adolescents are in the process of separating from their families and developing independence. As a result, their psychological well-being is often less directly linked to family influences. The finding that family dysfunction affected symptomatology only indirectly in our adolescent sample is consistent with this perspective.

A finding of this model that merits particular attention is the lack of a causal pathway between eating and other psychiatric disturbances. As discussed earlier, the causal direction between eating and other psychiatric symptoms has become a subject of controversy in recent years (Garner et al., 1990; Strober & Katz, 1987). The present results indicate that the two symptom variables are not causally linked. This finding provides empirical support for the view (Delvin & Walsh, 1989; Leung & Steiger, 1991) that one or more unspecified third variables (either genetic or psychological in nature) increase vulnerability both to eating disorders and to other psychiatric disturbances. A third source of influence would account for the frequently observed co-morbidity of these symptoms (Garner et al., 1984; Garner et al., 1990; Johnson & Conners, 1987; Laessle et al., 1989). Moreover, results of the path model point to self-inadequacy as a potentially important third variable that warrants serious consideration in future research. Pervasive feelings of inadequacy have been reported to

render adolescent girls vulnerable both to disturbed patterns of eating and to other forms of psychopathology (Bruch, 1985; Polivy & Herman, 1987; Strober, 1991).

The present study also tested an alternative model which partitioned the unitary construct of self-inadequacy into body-image deficit and general self-image deficit. This model provided a more detailed articulation of the causal linkages between two sources of family influence, two components of self-inadequacy, and two types of symptomatology. The results indicated that family environment enhanced vulnerabilities to eating disorders via two different pathways. Family preoccupation with weight and appearance defined the first pathway. It contributed directly to the development of body-image deficit, and both directly and indirectly via body dissatisfaction to disordered eating behaviors. These findings are consistent with previous studies (Pike & Rodin, 1991; Rodin et al., 1990; Striegel-Moore et al., 1986) which indicate that girls who come from families with heightened concerns about weight and appearance issues tend to internalize the "thin ideal" to a greater extent. As a result, they experience higher level of body dissatisfaction, and are more susceptible to disordered eating behaviors. Body-image deficit in the model also had a direct effect on self-esteem deficit. This finding corroborates previous reports which indicate that body-image problems in adolescent girls often have a

negative impact on their global self-esteem (Ben-Tovim & Walker, 1991; McCarthy, 1990; Rosen, Gross, & Vara, 1987; Striegel-Moore et al., 1986). Family preoccupation with weight and body dissatisfaction also contributed indirectly through their negative effects on self-esteem to the development of psychiatric distress.

General family dysfunction defined the second pathway. It contributed directly to the development of negative self-esteem, and indirectly through negative self-esteem to the development of eating and other psychiatric symptoms. These findings are consistent with reports which indicate that families marked by rigidity and a lack of cohesion hinder the development of self-esteem in children (Cooper et al., 1983; Kawash & Kozeluk, 1990; Loeb et al., 1980; Smets & Hartup, 1988). Girls who fail in earlier periods of development to build an adequate sense of self-worth are likely to lean heavily on their external accomplishments and on others' favourable evaluations for compensatory ego boosts (Heatherton & Baumeister, 1991; White, 1989). This general self-esteem deficit which would take the form of a general dissatisfaction with one's self, excessive self-criticism, and an over-sensitivity to others' evaluations is in itself a major mental health hazard (Albee, 1985; Harder et al., 1984; Koenig et al., 1984; Polivy & Herman, 1987).

The present results indicate, however, that a disturbed body-image or self-image alone is not sufficient for the

development of serious eating pathology. It is the girl whose body-image and self-image are both problematic that is likely to develop clinical eating disorders. Growing up in a dysfunctional family which also places heavy emphasis on thinness and attractive appearance is likely to render a girl vulnerable to "pervasive feelings of inadequacy" which translate themselves into "feeling fat." As a result, she will rely heavily on manipulating her body to compensate for her pervasive sense of self-inadequacy. Any setback to her fragile self-esteem structure will lead her to resort to a readily available target for action, her body and dieting. Over the course of her development, losing weight may become the only means she knows by which to control her sense of self-inadequacy.

From this perspective, it is possible to argue that the cardinal feature of eating disorders is not actually "a fear of fatness" or "a pursuit of thinness", but an intense desire to get rid of a pervasive sense of self-inadequacy. The most unfortunate aspect of this problem, perhaps, is that girls who are at risk for eating disorders try to achieve the "right end" with the "wrong means." Crisp (1980) once described eating pathology as a distorted biological solution to an existential problem. The present results suggest that this existential problem may well originate from a misguided struggle to be released from a pervasive sense of self-inadequacy by losing weight.

There are several limitations of the study to be underlined as a concluding segment of this report. These limitations are important to address because they also suggest future lines of research in this area. First, the present study was not longitudinal; that is, it did not follow the teenage sample through the risk period for eating disorders. Therefore, any differences found between the HR group and other contrast groups can only be linked by inference to the etiology of eating disorders. A more definitive evaluation of the self-inadequacy risk model requires follow-up study. A particularly interesting question for future research, and one to be addressed by prospective design, involves the developmental relations among the groups identified in this study: the HR, the SO and the BO groups. Do these groups remain distinct over time? Or do certain individuals move from the BO or the SO group to the HR group? If so, under what conditions? What are the factors associated with vulnerability and invulnerability in this progression? Clarification with regard to these questions requires empirical work as well in further refining classificatory approaches for the screening of those who are candidates for eating disorders.

Second, while most of the instruments selected for the present study have demonstrated validity, the measure of family attitudes toward weight and appearance was constructed specifically for this study because no such

measure was known to have been developed in previous research. Although the items of this scale have face validity, concurrent, construct, and external validation of this scale remains to be done. Despite these psychometric shortcomings, the present results indicate that this domain of family influence is an extremely relevant area to evaluate in future research. The development of more rigorous and extensive indices, perhaps assessing both parental and siblings' attitudes toward weight and appearance, will enhance our understanding of the role of this largely neglected family parameter in the development of eating pathology.

Third, causal inferences concerning the directionality of relation among family characteristics, attributes of self-inadequacy, and symptomatology should be drawn with caution. In the absence of experimental control, correlation-based studies are vulnerable to alternative causal explanations and the influence of unmeasured variables. For example, although most theorists of eating disorders focus on the role of family and self-deficit as determinants of symptomatology outcomes, it is plossible to argue that the psychological state of the girl influences the perceptions she has concerning her family and her self-concept. In addition, there were practical constraints which limited the number of variables that could be included in the models used in the present study. Further

elaboration of the models and their longitudinal validation should increase our confidence in these findings.

Finally, the high school sample tested in the current study ranged in age from 12 to 17 years. It is unclear to what extent we can generalize findings from this sample to younger girls. Some investigators (Rodin et al., 1990; Streigel-Moore et al., 1986) have pointed out that while clinical eating pathology is rare in childhood, much of the ground work for the predisposition is laid in early childhood. Future research examining the self-inadequacy risk construct and its pertinence to family and symptomatology variables among younger girls should prove very useful.

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Apprendix A

English and French Versions of the Cover Sheet

SURVEY ON WOMEN AND HEALTH

The following questionnaire is about health problems that affect teenage girls and young women. It is being conducted to help health care workers better understand young women's health problems. To help in our study, we have asked you to fill out this questionnaire. There are no right or wrong answers to any of the questions. We would like you to complete the questionnaire honestly and carefully. Please know that your participation is very important to us, and greatly appreciated.

To protect your confidentiality, the researcher who collects your questionnaire will separate this first sheet containing your name from the sheets containing your answers. ALL OF THE INFORMATION THAT YOU GIVE WILL REMAIN CONFIDENTIAL.

If you do wish to have information about this study, or feedback about your results, please complete your address and phone number at the space provided below. THIS IS OPTIONAL AND YOU MAY CHOOSE NOT TO FILL THIS IN IF YOU WISH.

Name:_____

Address: _____

_____

Phone: _____

ETUDE SUR LA SANTÉ DES (JEUNES) FEMMES

Ce questionnaire a comme sujet les problèmes de santé qui sont propres à l'adolescente et à la jeune femme. Il est conçu pour aider les intervenants en soins-santé à comprendre davantage les problèmes de santé qui touchent ces groupes. Il n'y a pas de bonnes ou mauvaises réponses aux questions. S.V.P. complétez le questionnaire soigneusement et honnêtement. Votre collaboration à cette étude est grandement appréciée.

Pour protéger la confidentialité des participantes, les chercheurs qui recueillent vos questionnaires, sépareront cette page-ci qui vous identifie du reste du questionnaire sur lequel se trouvent vos réponses. Toutefois, TOUTE L'INFORMATION DEMEURE CONFIDENTIELLE.

Si vous désirez de l'information sur cette étude ou être informée de vos résultats, veuillez nous indiquer votre adresse et numéro de téléphone. CECI EST LAISSE A VOTRE DISCRETION, VOUS ETES LIBRE DE NE RIEN COMPLETER.

Nom:_____

Adresse:_____

_____

Téléphone:_____

Appendix B

English and French Versions of the Questionnaire for Demographic Information

1. TODAY'S DATE:_____

2. AGE:_____

3. DATE OF BIRTH: day_____ month_____ year_____

4. SCHOOL:_____

   GRADE:_____

5. WHAT TYPE OF WORK DO YOUR PARENTS DO (eg. doctor, carpenter, teacher, housekeeper, secretary, owner of business)?

   FATHER:_____

   MOTHER:_____

6. WHAT IS THE HIGHEST LEVEL OF EDUCATION YOUR PARENTS HAVE ACHIEVED?

   FATHER:_____

   MOTHER:_____

FOR QUESTIONS CONCERNING WEIGHT OR HEIGHT, PLEASE INDICATE THE MEASUREMENT UNIT (eg. kilograms/metres or pounds/feet).

1. PRESENT WEIGHT (approx):_____

2. PRESENT HEIGHT:_____

1. DATE D'AUJOURD'HUI:_____

2. AGE:_____

3. DATE DE NAISSANCE: jour_____ mois_____ année_____

4. ECOLE:_____ NIVEAU:_____

5. QUEL METIER OU PROFESSION EXERCENT VOS PARENTS (eg. docteur, ouvrier, professeur, reste à la maison, secrétaire, propriétaire d'une entreprise)?

   PERE:_____

   MERE:_____

6. QUEL EST LE NIVEAU D'EDUCATION LE PLUS ELEVE QUE VOS PARENTS ONT ATTEINT?:

   PERE:_____

   MERE:_____

POUR LES QUESTIONS SUIVANTES CONCERNANT VOTRE POIDS OU VOTRE GRANDEUR, VEUILLEZ INDIQUER L'UNITE DE MESURE (EX: ILOGRAMMES/METRES OU LIVRES/PIEDS).

1. POIDS ACTUEL (approx.):_____

2. GRANDEUR:_____

Appendix C

English and French versions of the Rosenberg's Self-esteem Scale

For the following statements please indicate how true each is of you by circling the appropriate number.

1	2	3	4	5
Not at all true of me	Rarely true of me	Sometimes true of me	Often true of me	Always true of me

1. On the whole, I am satisfied with myself.

   1 2 3 4 5

2. At times I think I am no good at all.

   1 2 3 4 5

3. I feel that I have a number of good qualities.

   1 2 3 4 5

4. I am able to do things as well as most other people.

   1 2 3 4 5

5. I feel I do not have much to be proud of.

   1 2 3 4 5

6. I certainly feel useless at times.

   1 2 3 4 5

7. I feel that I'm a person of worth, at least on an equal plane (level) with others.

   1 2 3 4 5

8. I wish I could have more respect for myself.

   1 2 3 4 5

9. All in all, I am inclined to feel that I am a failure.

   1 2 3 4 5

10. I take a positive attitude toward myself.

    1 2 3 4 5

Pour les énoncés suivants, S.V.P. indiquez jusqu'à quel point ils sont vrais pour vous en utilisant l'échelle suivante. Veuillez encercler le chiffre qui correspond à votre réponse.

1	2	3	4	5
Pas vrai pour moi	Rarement vrai pour moi	Parfois vrai pour moi	Souvent vrai pour moi	Toujours vrai

1. En général, je suis satisfaite de moi-même.

   1 2 3 4 5

2. Quelques fois, j'ai l'impression d'être bonne à rien.

   1 2 3 4 5

3. Je crois que j'ai plusieurs bonnes qualités.

   1 2 3 4 5

4. Je suis capable de faire les choses aussi bien que les autres.

   1 2 3 4 5

5. J'ai l'impression qu'il y a peu de choses à mon sujet dont je puisse être fière.

   1 2 3 4 5

6. Quelques fois, je me sens inutile.

   1 2 3 4 5

7. Je crois que ma valeur en tant que personne est au moins égale à celle des autres.

   1 2 3 4 5

8. J'aimerais avoir plus de respect envers moi-même.

   1 2 3 4 5

9. En général, j'ai tendance à croire que ma vie est un échec.

   1 2 3 4 5

10. J'ai une attitude positive envers moi-même.

1 2 3 4 5

Appendix D

English and French Versions of the Fear of Negative Evaluation Scale

For the following statements please indicate how true each is of you by circling the appropriate number.

1	2	3	4	5
Not at all true of me	Rarely true of me	Sometimes true of me	Often true of me	Always true of me

1. I worry about what other people will think of me even when I know it doesn't make any difference.

   1 2 3 4 5

2. I am unconcerned even if I know people are forming an unfavorable impression of me.

   1 2 3 4 5

3. I am frequently afraid of other people noticing my shortcomings.

   1 2 3 4 5

4. I rarely worry about what kind of impression I am making on someone.

   1 2 3 4 5

5. I am afraid that people will not approve of me.

   1 2 3 4 5

6. I am afraid that people will find fault with me.

   1 2 3 4 5

7. Other people's opinion of me do not bother me.

   1 2 3 4 5

8. When I am talking to someone, I worry about what they may be thinking about me.

   1 2 3 4 5

9. I am usually worried about what kind of impression I make.

   1 2 3 4 5

10. If I know someone is judging me, it has little effect on me.

1 2 3 4 5

11. Sometimes I think I am too concerned with what other people think of me.

1 2 3 4 5

12. I often worry that I will say or do the wrong things.

1 2 3 4 5

Pour les énoncés suivants, S.V.P. indiquez jusqu'à quel point ils sont vrais pour vous en utilisant l'échelle suivante. Veuillez encercler le chiffre qui correspond à votre réponse.

1	2	3	4	5
Pas vrai pour moi	Rarement vrai pour moi	Parfois vrai pour moi	Souvent vrai pour moi	Toujours vrai

1. Je m'inquiète de ce que les autres pensent de moi, même si je sais que cela ne changera rien.

   1 2 3 4 5

2. Je suis imperturbable même si je sais que les gens se forment une impression défavorable de moi.

   1 2 3 4 5

3. J'ai souvent peur que les gens s'aperçoivent de mes faiblesses.

   1 2 3 4 5

4. Je me soucie rarement de l'impression que je donne aux gens.

   1 2 3 4 5

5. J'ai peur que les gens ne m'approuvent pas.

   1 2 3 4 5

6. J'ai peur que les gens trouvent mes défauts.

   1 2 3 4 5

7. Les opinions que les autres ont de moi ne me dérangent pas.

   1 2 3 4 5

8. Quand je parle avec quelqu'un, je me soucie de ce qu'il/elle pense de moi.

   1 2 3 4 5

9. En général, je me soucie de l'impression que je donne.

   1 2 3 4 5

10. Si je sais que quelqu'un porte un jugement sur moi, cela ne me dérange pas.

1 2 3 4 5

11. Quelques fois, je pense que je me préoccupe trop de ce que les autres pensent de moi.

1 2 3 4 5

12. J'ai souvent peur de dire ou faire la mauvaise chose.

1 2 3 4 5

Appendix E

English and French Versions of the Body Dissatisfaction Scale

Please read the following statements carefully and indicate how often they apply to you by circling the appropriate number.

1	2	3	4	5
Never	Once in a while	Sometimes	Frequently	Always

1. I think that my stomach is too big.

1 2 3 4 5

2. I think that my thighs are too large.

1 2 3 4 5

3. I think that my hips are just the right size.

1 2 3 4 5

4. I like the shape of my buttocks.

1 2 3 4 5

5. I think that my hips are too big.

1 2 3 4 5

6. I think that my thighs are just the right size.

1 2 3 4 5

7. I think that my buttocks are too large.

1 2 3 4 5

8. I feel satisfied with the shape of my body.

1 2 3 4 5

Lisez attentivement les énoncés suivants et indiquez à quelle fréquence ils s'appliquent à vous en encerclant chiffre qui correspond à votre réponse.

1	2	3	4	5
Jamais	Rarement	Parfois	Souvent	Toujours

1. Je pense que mon ventre est trop gros.

1 2 3 4 5

2. Je pense que mes cuisses sont trop grosses.

1 2 3 4 5

3. Je pense que mes hanches sont de la bonne grosseur.

1 2 3 4 5

4. J'aime la forme de mes fesses.

1 2 3 4 5

5. Je pense que mes hanches trop grosses.

1 2 3 4 5

6. Je pense que mes cuisses sont de la bonne grosseur.

1 2 3 4 5

7. Je pense que mes fesses sont trop grosses.

1 2 3 4 5

8. Je suis satisfaite de la forme de mon corps.

1 2 3 4 5

Appendix F

English and French Versions of the

E ting Attitudes Test - 26

Please read the following statements and indicate how often they apply to you, using the scale shown below:

ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
1	2	3	4	5	6

1. I am terrified of being overweight.

1 2 3 4 5 6

2. I avoid eating when I am hungry.

1 2 3 4 5 6

3. I find myself preoccupied with food.

1 2 3 4 5 6

4. I have gone on eating binges where I feel that I may not be able to stop.

1 2 3 4 5 6

5. I cut my food into small pieces.

1 2 3 4 5 6

6. I am aware of the caloric content of foods that I eat.

1 2 3 4 5 6

7. I particularly avoid foods with a high carbohydrate content (eg. bread, potatoes, rice, etc.).

1 2 3 4 5 6

8. I feel that others would prefer if I ate more.

1 2 3 4 5 6

9. I vomit after I have eaten.

1 2 3 4 5 6

10. I feel extremely guilty after eating.

1 2 3 4 5 6

11. I am preoccupied with a desire to be thinner.

1 2 3 4 5 6

12. I think about burning up calories when I exercise.

1 2 3 4 5 6

13. I feel that other people think I am too thin.

1 2 3 4 5 6

14. I am preoccupied with the thought of having fat in my body.

1 2 3 4 5 6

15. I take longer than others to eat my meals.

1 2 3 4 5 6

16. I avoid foods with sugar in them.

1 2 3 4 5 6

17. I eat diet foods.

1 2 3 4 5 6

18. I feel that food controls my life.

1 2 3 4 5 6

19. I display self-control around food.

1 2 3 4 5 6

20. I feel that others pressure me to eat.

1 2 3 4 5 6

21. I give too much time and thought to food.

1 2 3 4 5 6

22. I feel uncomfortable after eating sweets.

1 2 3 4 5 6

23. I engage in dieting behaviour.

1 2 3 4 5 6

24. I like my stomach to be empty.

1 2 3 4 5 6

25. I enjoy trying new rich foods.

1 2 3 4 5 6

26. I have the impulse to vomit after meals.

1 2 3 4 5 6

Lisez les énoncés suivants et indiquez à quelle fréquence ils s'appliquent à vous en utilisant l'échelle suivante.

Toujours	Généralement	Souvent	Parfois	Rarement	Jamais
1	2	3	4	5	6

1. J'ai extrèmement peur d'être trop grosse.

   1 2 3 4 5 6

2. J'évite de manger quand j'ai faim.

   1 2 3 4 5 6

3. Je trouve que je suis trés préoccupée par la nourriture.

   1 2 3 4 5 6

4. J'ai eu des excès de gloutonnerie durant lequels je me sentais incapable d'arrêter de manger.

   1 2 3 4 5 6

5. Je coupe ma nourriture en petits morceaux.

   1 2 3 4 5 6

6. Je connais la teneur calorique des aliments que je mange.

   1 2 3 4 5 6

7. J'évite surtout les aliments riches en hydrates de carbone (pain, pommes de terre, riz, etc.).

   1 2 3 4 5 6

8. Je sens que les autres préféreraient que je mange plus.

   1 2 3 4 5 6

9. Je vomis après avoir mangé.

   1 2 3 4 5 6

10. Je me sens très coupable après avoir mangé.

    1 2 3 4 5 6

11. Le désir d'être plus mince me préoccupe.

1 2 3 4 5 6

12. Quand je fais de l'exercise physique je pense à brûler des calories.

1 2 3 4 5 6

13. Je sens que les gens pensent que je suis trop mince.

1 2 3 4 5 6

14. Je suis préoccupée à l'idée d'avoir trop de graisse dans le corps.

1 2 3 4 5 6

15. Ca me prend plus de temps que les autres à manger mes repas.

1 2 3 4 5 6

16. J'évite de manger des aliments qui contiennent du sucre.

1 2 3 4 5 6

17. Je mange des aliments diététiques.

1 2 3 4 5 6

18. J'ai l'impression que la nourriture domine ma vie.

1 2 3 4 5 6

19. Je suis capable de me contrôler concernant la nourriture.

1 2 3 4 5 6

20. Je sens que les autres me poussent à manger.

1 2 3 4 5 6

21. J'accorde trop de temps et de pensée à la nourriture.

1 2 3 4 5 6

22. Je ne me sens pas bien après avoir mangé de la nourriture sucrée.

1 2 3 4 5 6

23. Je me mets à la diète.

1 2 3 4 5 6

24. J'aime avoir l'estomac vide.

1 2 3 4 5 6

25. J'aime essayer des nouveaux aliments riches.

1 2 3 4 5 6

26. J'ai un besoin irrésistible de vomir après les repas.

1 2 3 4 5 6

Appendix G

English and French Sample Items of the

Depression and Obsessive-compulsive Subscales of the SCL-90 *

* Copyrighted Materials: Only a maximum of six sample items are allowed to be included in any published work.

Sample Items of the Depression Subscale

(English Version)

1. Feeling low in energy or slowed down.
2. Thoughts of ending your life.
3. Feeling hopeless about the future.

(French Version)

1. Sentiment d'être au ralenti ou de manquer d'énergie.
2. Vous pensez à vous enlever la vie.
3. Sentiment pessimiste face à l'avenir.

Sample Items of the Obsessive-compulsive Subscale

(English Version)

1. Repeated unpleasant thoughts that won't leave your mind.

2. Having to check and double check what you do.

3. Having to repeat the same actions such as touching, counting, and washing.

(French Version)

1. Pensées désagréables répétées dont vous ne pouvez vous débarasser.

2. Besoin de vérifier et de revérifier ce que vous faites.

3. Besoin de répéter les mêmes actions telles que toucher, compter et laver.

Appendix H

English and French Versions of the Biphasic Mood Scale

For the following statements please indicate how true each is of you by circling the appropriate number.

1	2	3	4	5
Not at all true of me	Rarely true of me	Sometimes true of me	Often true of me	Always true of me

1. My enjoyment in being with people changes - from times when I enjoy them immensely and want to be with them all the time, to times when I don't want to see them at all.

   1 2 3 4 5

2. My mood or energy shifts rapidly back and forth from happy to sad or high to low.

   1 2 3 4 5

3. Compared to my friends, I'm more up and down in my mood.

   1 2 3 4 5

4. I experience both pleasurable and painful emotions more intensely than other people.

   1 2 3 4 5

5. I find that my feelings or energy level are generally up or down, but rarely in the middle.

   1 2 3 4 5

6. I find that my thinking changes greatly - that there are periods of several days or more when I think better than most people, and other periods when my mind doesn't work well at all.

   1 2 3 4 5

7. I have periods lasting several days or more when I feel depressed or irritable, and then other periods of several days or more when I feel extremely high, elated, and overflowing with energy.

   1 2 3 4 5

Pour les énoncés suivants, S.V.P. indiquez jusqu'à quel point ils sont vrais pour vous en encerclant le chiffre qui correspond à votre réponse.

1	2	3	4	5
Pas vrai pour moi	Rarement vrai pour moi	Parfois vrai pour moi	Souvent vrai pour moi	Toujours vrai

1. Le plaisir que j'éprouve à passer du temps avec d'autres varie -- parfois je trouve leur présence très agréable et je veux passer tout mon temps avec eux, à d'autres moments je ne veux pas les voir du tout.

   1 2 3 4 5

2. Mon humeur ou mon énergie change rapidement d'heureuse à triste, ou de haute à basse, et vice-versa.

   1 2 3 4 5

3. Comparée à mes ami(e)s, mon humeur a plus de va-et-vient (de bonne à mauvaise).

   1 2 3 4 5

4. Je ressens les émotions agréables ou douloureuses avec plus d'intensité que les autres.

   1 2 3 4 5

5. Il me semble que mes sentiments ou mon énergie sont généralement très bons ou déprimés mais jamais dans le milieu.

   1 2 3 4 5

6. Je trouve que ma capacité intellectuelle change beaucoup -- il y a des périodes de plusieurs journées pendant lesquelles je pense mieux que les autres, puis il y a des périodes ou mon esprit n'est bon à rien.

   1 2 3 4 5

7. Je passe des périodes de plusieurs journées à me sentir deprimée ou irritable et j'en passe d'autres ou je me sens très heureuse et pleine d'énergie.

   1 2 3 4 5

Appendix I

English and French Versions of the Brief Impulsivity Scale

For the following statements please indicate how true each is of you by circling the appropriate number.

1 Not at all true of me	2 Rarely true of me	3 Sometimes true of me	4 Often true of me	5 Always true of me

1. In anger, I've said things to others (e.g. teachers, parents) that have gotten me into trouble.

   1 2 3 4 5

2. I often get into trouble because I don't think ahead.

   1 2 3 4 5

3. When I have a problem, I can usually take my time to solve it calmly.

   1 2 3 4 5

4. People tell me that I act like a child when I am frustrated.

   1 2 3 4 5

5. I have done things on impulse that get me into trouble (like spending too much, drinking too much, going out with the wrong people, shoplifting).

   1 2 3 4 5

6. I can have a temper easily.

   1 2 3 4 5

7. When I'm upset, I can do risky things without caring about the consequences.

   1 2 3 4 5

8. I would do almost anything on a dare.

   1 2 3 4 5

9. I fall in and out of love easily.

   1 2 3 4 5

10. I often do whatever makes me feel cheerful here and now, even at the cost of some distant goal.
1 2 3 4 5

Pour les énoncés suivants, S.V.P. indiquez jusqu'à quel point ils sont vrais pour vous en encerclant le chiffre qui correspond à votre réponse.

1	2	3	4	5
Pas vrai pour moi	Rarement vrai pour moi	Parfois vrai pour moi	Souvent vrai pour moi	Toujours vrai

1. En colère, j'ai dit des choses (ex. à des professeurs, à mes parents) qui m'ont causé des ennuis.

   1 2 3 4 5

2. Il m'arrive souvent d'avoir des ennuis parce que je ne réfléchi pas assez avant d'agir.

   1 2 3 4 5

3. D'habitude, quand j'ai un problème, je suis capable de prendre mon temps pour le résoudre calmement.

   1 2 3 4 5

4. Les gens disent que j'agis comme une enfant quand je suis frustrée.

   1 2 3 4 5

5. J'ai déjà posé des gestes impulsifs qui m'ont amenés des ennuis (c.à d. trop dépensé, sortie avec des gens "pas corrects", volé à l'étalage).

   1 2 3 4 5

6. Je peux facilement me mettre en colère.

   1 2 3 4 5

7. Quand je suis bouleversée, je peux faire des choses risquées sans me soucier des conséquences.

   1 2 3 4 5

8. Je ferais presque n'importe quoi pour relever un pari.

   1 2 3 4 5

9. Du jour au lendemain, je deviens amoureuse et puis je ne le suis plus.

   1 2 3 4 5

10. Je fais souvent tout ce que je peux pour être heureuse dans le moment présent, même au prix d'un objectif plus éloigné.

1 2 3 4 5

Appendix J

English and French Versions of the Family Adaptability and Cohesion Evaluation Scale

Please read the following statements and indicate (by circling the appropriate number) how often they apply to your family.

1 Never	2 Once in a while	3 Sometimes	4 Frequently	5 Always

1. In my family, members ask each other for help.

   1 2 3 4 5

2. In solving problems in my family, the children's suggestions are followed.

   1 2 3 4 5

3. We approve of each other's friends.

   1 2 3 4 5

4. Children have a say in their discipline.

   1 2 3 4 5

5. We like to do things with just our family.

   1 2 3 4 5

6. Different persons act as leaders in our family.

   1 2 3 4 5

7. Family members feel closer to each other than to people outside the family.

   1 2 3 4 5

8. Our family changes its way of handling tasks.

   1 2 3 4 5

9. Family members like to spend free time with each other.

   1 2 3 4 5

10. Parents and children discuss punishment together.

    1 2 3 4 5

11. Family members feel very close to each other.

1 2 3 4 5

12. The children make the decisions in our family.

1 2 3 4 5

13. When our family gets together for activities, everybody is present.

1 2 3 4 5

14. Rules change in our family.

1 2 3 4 5

15. We can easily think of things to do together as a family.

1 2 3 4 5

16. We shift household responsibilities from person to person.

1 2 3 4 5

17. Family members consult other family members on their decisions.

1 2 3 4 5

18. It is hard to identify the leaders in our family.

1 2 3 4 5

19. Family togetherness is very important.

1 2 3 4 5

20. It is hard to tell who does which household chores.

1 2 3 4 5

Lisez les énoncés suivants et indiquez à quelle fréquence ils s'appliquent à votre famille en encerclant chiffre qui correspond à votre réponse.

1	2	3	4	5
Jamais	Rarement	Parfois	Souvent	Toujours

1. Les membres de ma famille s'entraident.

   1 2 3 4 5

2. Pour régler des problèmes, les suggestions des enfants sont utilisées.

   1 2 3 4 5

3. Nous acceptons les amis de tous les membres de la famille.

   1 2 3 4 5

4. Les enfants ont leur mot à dire concernant leur discipline.

   1 2 3 4 5

5. Nous aimons faire des activités en famille.

   1 2 3 4 5

6. Plusieurs personnes dans ma famille prennent le rôle de "chef."

   1 2 3 4 5

7. Les membres de ma famille se sentent plus proches les uns des autres qu'avec des personnes qui ne font pas partie de la famille.

   1 2 3 4 5

8. Ma famille change la façon de faire les choses.

   1 2 3 4 5

9. Les membres de ma famille aiment passer leur temps libre ensemble.

   1 2 3 4 5

10. Les parents et les enfants discutent les punitions ensemble.

1 2 3 4 5

11. Les membres de ma famille se sentent très proches les uns des autres.

1 2 3 4 5

12. Les enfants prennent les décisions dans notre famille.

1 2 3 4 5

13. Quand notre famille se réunit pour des activités, tous les membres sont présents.

1 2 3 4 5

14. Les règlements changent dans notre famille.

1 2 3 4 5

15. Nous n'avons pas de problème à trouver des activités auxquelles toute la famille peut participer.

1 2 3 4 5

16. La responsabilité des tâches ménagères est assignée d'un membre à l'autre de la famille.

1 2 3 4 5

17. Les membres de ma famille se consultent entre eux pour prendre leurs décisions.

1 2 3 4 5

18. C'est difficile d'identifier les chefs dans notre famille.

1 2 3 4 5

19. L'unité de la famille est très importante.

1 2 3 4 5

20. Il est difficile de dire qui fait quelles tâches ménagères dans ma famille.

1 2 3 4 5

Appendix K

English and French Versions of the Family Attitudes Toward Weight and Shape Scale

Please read the following statements carefully and indicate how often they apply to you by circling the appropriate number.

1	2	3	4	5
Never	Once in a while	Sometimes	Frequently	Always

1. Members in my family encourage me to watch my figure.

   1 2 3 4 5

2. I have been hurt by family members teasing me about my weight.

   1 2 3 4 5

3. Members of my family watch their weight carefully.

   1 2 3 4 5

4. Members of my family put great emphasis on physical appearance.

   1 2 3 4 5

5. Someone in my family is always on diet.

   1 2 3 4 5

6. What one "should" and "shouldn't" eat is a frequent topic of conversation in my family.

   1 2 3 4 5

Lisez attentivement les énoncés suivants et indiquez à quelle fréquence ils s'appliquent à vous en encerclant chiffre qui correspond à votre réponse.

1	2	3	4	5
Jamais	Rarement	Parfois	Souvent	Toujours

1. Des membres de ma famille m'encouragent à surveiller ma ligne.

   1 2 3 4 5

2. J'ai été blessée par des membres de ma famille qui me taquinaient au sujet de mon poids.

   1 2 3 4 5

3. Des membres de ma famille surveillent leur poids de très près.

   1 2 3 4 5

4. Des membres de ma famille mettent énormément d'importance sur l'apparence physique.

   1 2 3 4 5

5. Il y a toujours quelqu'un dans ma famille qui suit une diète.

   1 2 3 4 5

6. Ce que l'on doit et ne doit pas manger est un sujet fréquemment discuté dans ma famille.

   1 2 3 4 5

Appendix L

English and French Versions of the Letter Sent to Parents and the Consent Form

Dear Parents,

We are a team of researchers affiliated with the Douglas Hospital Centre. Currently, we are conducting a survey on health-related attitudes and behaviors among adolescent girls in Montreal. The main objective of this study is to identify factors that can help predict the likelihood of health-related problems in young women. This study has been approved by the authorities of the school your daughter attends. Her participation, if you consent to it, requires her to fill out a questionnaire at her school under the joint supervison of her teacher and our research staff. All information collected will remain strictly confidential. Your daughter's participation in this study will contribute valuable information to the understanding of some of today's health concerns among adolescent girls.

Thank you in advance for your cooperation. For further information about this study, do not hesitate to contact Freedom Leung or Judi Gulko at 731-6131, extension 24895.

Sincerely yours,

Freedom Leung
Research Associate
Douglas Hospital Centre

Consent Form

I, _____, am willing to participate in this study. I understand that my participation in this study requires me to complete a 45-minute questionnaire at my school. My participation in this study is completely voluntary, and all information that I give will remain strictly confidential. I am free to withdraw from the study at any time without further obligations.

Name (Please Print): _____

Signature: _____

Date: _____

As the parent or legal guardian of _____, I have read the attached letter and I give her my permission to participate in the above mentioned study.

Name (Please Print): _____

Signature: _____

Date: _____

Chers parents,

Nous sommes une équipe de chercheurs affiliée au Centre Hospitalier Douglas. Nous faisons présentement à Montréal un sondage sur les attitudes et comportements des adolescentes vis-à-vis la santé. Le but principal de cette étude est d'identifier les facteurs pouvant aider à prédire l'incidence de problèmes de santé chez les jeunes femmes. Cette étude a été approuvée par la la direction de l'école que votre fille fréquente. Sa participation, si vous y consentez, exige qu'elle remplisse un questionnaire à son l'école, sous la supervision de son professeur et d'un membre de notre équipe de recherche. Toute information obtenue est strictement confidentielle. La participation de votre fille à cette étude nous fournira de l'information pour mieux comprendre les problèmes de santé des adolescentes d'aujourd'hui.

Nous vous remercions d'avance de votre coopération. Si vous avez des questions concernant cette étude, n'hésitez pas à communiquer avec moi ou Judi Gulko au 731-6131, poste 24895, comme il vous conviendra.

Cordialement,

Freedom Leung
Chercheur
Centre Hospitalier Douglas

Formule de consentement

Je, _____, consens à participer à cette étude. Je comprends que ma participation exige que je consacre 45 minutes à compléter un questionnaire à l'école. Ma participation à cette étude est entièrement volontaire et toute information que je fournis est absolument confidentielle. J'ai le droit d'arrêter de participer à cette étude à n'importe quel moment sans aucune obligation.

Nom (en lettres majuscules): _____

Signature: _____

Date: _____

A titre de parent ou tuteur de _____, j'ai lu la lettre ci-incluse et lui donne la permission de participer à l'étude ci-haut mentionnée.

Nom (en lettres majuscules): _____

Signature: _____

Date: _____

Appendix M

Means and ANCOVA Results for Symptoms and Family Variables by Group Adjusted for Weight

Means and ANCOVA Results for Symptom and Family Variables by Group Adjusted for Weight

	Patients n=74	HR n=81	IR n=116	LR n=720	Adj. F	df
EAT-26	32.78[a]	20.81[b]	13.69[c]	7.95[d]	1.09	1, 967
Depression	64.01[a]	59.29[b]	55.30[c]	46.31[d]	3.57	1, 967
Biphasic Mood	60.09[a]	57.67[ab]	54.98[b]	47.01[c]	6.17*	1, 966
Obessive-compulsiveness	60.84[a]	56.73[b]	55.09[b]	47.04[c]	1.84	1, 966
Impulsivity	54.51[a]	56.65a	55.31[a]	47.97[b]	2.62	1, 967
Family Cohesion	26.98[c]	26.97[c]	30.15[b]	33.26[a]	0.32	1, 967
Family Adaptability	22.89[c]	24.15[bc]	25.73[ab]	26.93[a]	1.60	1, 967
Family Attitudes	24.37[a]	23.24a	21.39[b]	18.93[c]	52.34**	1, 951

Note. HR = High Risk; IR = Intermediate Risk; LR = Low Risk.
Means with different superscripts differ significantly at the .05 level.
* P < .05. ** P < .0001.