

FAMILY CHARACTERISTICS OF ANOREXIC, BULIMIC,  
PSYCHIATRIC CONTROL, AND NONPSYCHIATRIC CONTROL  
FEMALE ADOLESCENTS

by

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## Abstract

The aim of the present study was to investigate the characteristics and interaction patterns in the families of adolescent eating-disordered patients. Four groups of female adolescents and their mothers (restrictive anorexic, bulimic type, psychiatric control, and nonpsychiatric control) were assessed on a number of self-report instruments: The Family Environment Scale, Dyadic Adjustment Scale, Work and Family Orientation Questionnaire, Sex Role Ideology Scale, Food Fitness and Looks Questionnaire, and Body Esteem Scale. Support was found for the hypothesis that the families of bulimic type and psychiatric control subjects are characterized as more dysfunctional than the families of restrictive anorexic and nonpsychiatric control subjects. In particular, restrictive anorexic and nonpsychiatric control mothers and daughters characterized their families as more cohesive than did bulimic type and psychiatric control mothers and daughters. No differences were found amongst the four groups on expressiveness, conflict, independence, organization, control, or marital adjustment. These family interaction data were found to vary with the adolescent's level of depression, general psychiatric distress, and impulsivity, but only for daughters, not for mothers. Little support was found for the hypothesis that restrictive anorexic and bulimic type mothers and daughters are characterized as higher in achievement orientation, traditional sex role ideology, and weight and appearance orientation than

psychiatric control mothers and daughters. There were no group differences with respect to individual or family achievement orientation; however, restrictive anorexic and nonpsychiatric control daughters did have higher school grades than psychiatric control daughters. No differences in sex role ideology were found amongst the groups. Restrictive anorexic and bulimic type daughters, but not mothers, ascribed greater importance to weight and had more negative attitudes toward their own weight than psychiatric and nonpsychiatric control daughters. No group differences were found for mothers or daughters with respect to attitude toward one's own attractiveness or importance ascribed to appearance or fitness. Potential explanations for lack of congruence with the theoretical literature are advanced, and the possible specificity of family pseudocohesiveness and problem denial to eating disorders is discussed.

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## Introduction

Anorexia nervosa and bulimia nervosa are considered to be multidetermined disorders of eating. There has been much interest over the past decade in possible contributing factors within the families of those with eating disorders. Theoretical formulations, clinical data, and controlled studies have suggested that the family environment of restrictive anorexic individuals is cohesive and harmonious while the family environment of bulimic individuals is disengaged and conflictual. The vast majority of controlled studies have employed adult women as subjects and have not included a psychiatric control group. It has also been postulated that the families of eating-disordered subjects may be characterized by high achievement orientation, traditional sex-role ideology, and high weight and appearance orientation; however, little controlled research has addressed these issues. The present study was conducted in an effort to extend and contribute to the eating disorder family literature by investigating the characteristics and interaction patterns in the families of female adolescent anorexic and bulimic subjects, as perceived by both the adolescent and her mother. In addition, a psychiatric control group was employed so as to yield information on the specificity of family factors to eating disorders.

Before proceeding to a review of the literature on family factors in anorexia nervosa and bulimia nervosa, the two

eating disorders will be defined and diagnostic issues will be discussed.

### Anorexia Nervosa

Anorexia nervosa is an eating disorder in which an individual is fearful of gaining weight or becoming fat, feels fat in one or more areas of the body, and, as a result, engages in behaviors to decrease weight or pursue thinness. The primary weight-reducing behavior engaged in is very restrictive dieting, usually involving severe limits on caloric intake and complete avoidance of certain foods. Extensive exercising, self-induced vomiting, or the use of laxatives or diuretics may also be used for the purpose of weight reduction. Through such behaviors, anorexic individuals lose a significant proportion of their body weight and maintain their weight at a level below that expected for their age and height.

Anorexics may show other features in addition to the various weight-reducing behaviors described above. For instance, they may collect recipes, hoard food, follow monotonous or unusual diets, perform eating rituals, or prepare elaborate meals for others but not partake of them themselves (e.g., American Psychiatric Association, 1987; Bemis, 1978). Binge-eating episodes may also occur. Another feature is that the individual usually denies or minimizes the severity of the problem, and is uninterested in or resistant to therapy (e.g., American Psychiatric Association, 1987). It is of note that the term anorexia is a misnomer as an actual

loss of appetite is rarely present except, at times, during the later stages of the disorder (American Psychiatric Association, 1980, 1987).

In the present study, the diagnostic criteria of the revised edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987) were used to operationalize the syndrome of anorexia nervosa. These diagnostic criteria are as follows:

- A. Refusal to maintain body weight over a minimal normal weight for age and height, e.g., weight loss leading to maintenance of body weight 15% below that expected; or failure to make expected weight gain during period of growth, leading to body weight 15% below that expected.
- B. Intense fear of gaining weight or becoming fat, even though underweight.
- C. Disturbance in the way in which one's body weight, size, or shape is experienced, e.g., the person claims to "feel fat" even when emaciated, believes that one area of the body is "too fat" even when obviously underweight.
- D. In females, absence of at least three consecutive menstrual cycles when otherwise expected to occur (primary or secondary amenorrhea).

Anorexia nervosa is more prevalent in women than in men: The American Psychiatric Association (1987) estimates that 95% of those with anorexia are female. (Similar statistics are reported for bulimia nervosa and, therefore, the feminine pronoun will be used in this thesis when referring to

individuals with eating disorders.) The onset of anorexia is usually in early to late adolescence, and researchers suggest that the incidence of the disorder has been rapidly increasing in industrialized societies over the last 20 to 30 years (e.g., Bemis, 1978; Mitchell & Eckert, 1987). The prevalence of anorexia nervosa is estimated to be less than 1% (e.g., American Psychiatric Association, 1987; Bemis, 1978; Pope, Hudson, & Yurgelun-Todd, 1984). Finally, the mortality rate in anorexia nervosa has been estimated to be from as low as 3-5% to as high as 18-25% (e.g., American Psychiatric Association, 1987; Bemis, 1978).

#### Bulimia Nervosa

Many labels have been attached to the syndrome referred to in this thesis as bulimia nervosa, including bulimia (American Psychiatric Association, 1980), bulimarexia (Boskind-Lodahl & White, 1978; Boskind-White & White, 1987), the abnormal normal weight control syndrome (Crisp, 1981), and dietary chaos syndrome (Palmer, 1979). "Bulimia nervosa" was coined by Russell (1979) and has been adopted for use in the DSM-III-R (American Psychiatric Association, 1987). This term is preferred by the author as it highlights the relationship of bulimia nervosa to anorexia nervosa, and as "bulimia" is sometimes used to refer solely to the symptom of binge-eating.

Bulimia nervosa is an eating disorder in which an individual has episodes of binge eating and also engages in behaviors to reduce weight or to prevent weight gain. The bulimic individual may be underweight, overweight, or, most

often, of normal weight (e.g., American Psychiatric Association, 1987; Garner, 1986; Schlesier-Stropp, 1984). Following a binge-eating episode, the bulimic individual may self-induce vomiting, take laxatives or diuretics, exercise vigorously, or begin dieting or fasting to counteract the fattening effects of the binge. However, these behaviors may also be engaged in independently of the binge-eating episodes for purposes of weight control.

Binge eating has been reported to vary greatly on quantitative indices. The duration of a binge may range from 15 minutes to 8 hours ( $\bar{M} = 1.2$  hours); the frequency of binge-eating episodes may vary between 1 and 46 per week ( $\bar{M} = 11.7$ ); and during an average binge-eating episode, 4800 calories may be consumed (Johnson, Lewis, & Hagman, 1984). It is unclear, however, whether such quantitative indices are critical in defining what constitutes a binge. Instead, it has been suggested that the subjective experience of feeling out of control during a binge may be more important in its definition (Johnson et al., 1984; Johnson, Lewis, Love, Stuckey, & Lewis, 1983).

While the presenting symptoms of the bulimic individual are often the binge eating and purgative behaviors (i.e., self-induced vomiting and laxative abuse), it must be kept in mind that the desire to be thin is also a central feature of the disorder. Like the anorexic, the bulimic fears fatness and is preoccupied with her weight and shape (Crisp, 1981), complains of being too fat when others do not perceive her to

be so (Boskind-Lodahl & White, 1978), and is determined to weigh less than some predetermined threshold (Russell, 1979). Garner (1986) has stated that individuals with bulimia nervosa may appear to be less resistant to treatment than individuals with anorexia nervosa because they wish to eliminate their binge-eating behavior whereas, in fact, they are similarly resistant to giving up their dieting behaviors. Garner (1986) and other authors (e.g., Crisp, 1981) have suggested that the bulimic individual often wishes she were anorexic.

As with anorexia nervosa, the diagnostic criteria of the DSM-III-R were used in the present study to operationalize the syndrome of bulimia nervosa. These diagnostic criteria are as follows:

- A. Recurrent episodes of binge eating (rapid consumption of a large amount of food in a discrete period of time).
- B. A feeling of lack of control over eating behavior during the eating binges.
- C. The person regularly engages in either self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain.
- D. A minimum average of two binge eating episodes a week for at least three months.
- E. Persistent overconcern with body shape and weight.

Bulimia nervosa, like anorexia nervosa, is more prevalent in women than in men: Estimates suggest that from 90% (Striegel-Moore, Silberstein, & Rodin, 1986) to 99% (Johnson, Stuckey, Lewis, & Schwartz, 1983) of bulimic individuals are

female. The onset of bulimia nervosa is usually in adolescence or early adulthood (American Psychiatric Association, 1987). A mean age of onset of 18 years has been reported in three major studies of bulimia nervosa (Johnson et al., 1983; Mitchell, Hatsukami, Eckert, & Pyle, 1985; Pyle, Mitchell, & Eckert, 1981). It is further reported that self-induced vomiting usually begins approximately one year after the onset of binge eating.

Finally, the prevalence of bulimia nervosa has been found to vary with the diagnostic criteria employed. Mitchell and Eckert (1987) reported that 26% to 79% of women and 41% to 60% of men report binge eating, depending on how it is defined. This illustrates the need to require more than the symptom of binge eating for a diagnosis of bulimia nervosa. In general, not utilizing any frequency criteria for binge eating or purging yields prevalence rates of bulimia of from 8 to 10%, whereas requiring weekly or greater frequencies of binge eating and purging yields prevalence rates of from 1 to 5% (e.g., Johnson, Lewis, Love, Stuckey, & Lewis, 1983; Mitchell, & Eckert, 1987; Pope et al., 1984; Pyle, Mitchell, Eckert, Halvorson, Neuman, & Goff, 1983).

### Diagnostic Issues

In the preceding two sections, the current diagnostic criteria for anorexia nervosa and bulimia nervosa were described. However, these sets of criteria are in the process of evolution and there is some debate in the literature as to which distinctions among eating disorders are the most valid.



Currently, potential revisions to the diagnostic criteria for eating disorders are being proposed for the forthcoming DSM-IV (Wilson & Walsh, 1991).

One controversial issue is whether anorexia nervosa and bulimia nervosa should be considered separate disorders (e.g., Abraham & Beumont, 1982; Johnson et al., 1983; Schlesier-Stropp, 1984). In particular, there is some debate over whether bulimia nervosa should be a distinct diagnosis. The diagnostic criteria for bulimia nervosa were only developed in 1979 and 1980. The attention to bulimia nervosa came partly as a result of researchers finding bulimic symptoms in their anorexic subjects (Schlesier-Stropp, 1984); however, bulimia nervosa is also found in obese and, especially, normal-weight subjects (e.g., Johnson et al., 1983). The most recent diagnostic manual (DSM-III-R; American Psychiatric Association, 1987) changed the disorder's label from bulimia to bulimia nervosa to reflect its strong relationship to anorexia nervosa. Researchers point out that the attitudes towards eating and weight are very similar in anorexia nervosa and bulimia nervosa (e.g., Fairburn & Garner, 1986; Pyle et al., 1981; Russell, 1979), and that the same patient may alternate between the disorders of anorexia nervosa and bulimia nervosa at different times (e.g., Abraham & Beumont, 1982; Garner, 1986).

In contrast to the issue of whether anorexia nervosa and bulimia nervosa are separate disorders, another issue concerns how best to further subdivide these eating disorders. For

instance, anorexia nervosa patients may or may not exhibit the symptoms of bulimia nervosa, and bulimia nervosa patients may or may not have a history of anorexia nervosa. This leads to distinctions between "restrictive anorexics" and "bulimic anorexics," and bulimics with and without a history of anorexia nervosa. Researchers and clinicians suggest that between 25% and 50% of anorexia nervosa patients develop bulimic symptoms (e.g., Bruch, 1984; Garner, Rockert, Olmsted, Johnson, & Coscina, 1984; Mitchell & Pyle, 1982). For bulimia nervosa samples, estimates range from 6% to 29% for a history of anorexia nervosa (e.g., Fairburn, 1984; Johnson & Larson, 1982; Pyle et al., 1981). Some authors suggest that bulimic symptoms may develop as a function of chronicity in anorexia nervosa (e.g., Crisp, 1981; Johnson & Larson, 1982), and others report that the bulimic behaviors often begin early in the disorder (e.g., Abraham & Beumont, 1982). Probably many scenarios occur. For example, there may be anorexics who exhibit bulimic symptoms after a long period of restriction, anorexics who begin binge eating with purging at the onset of the disorder, and patients in whom bulimic symptoms occur in the absence of anorexia nervosa.

How valid are the eating disorder distinctions? With respect to the distinction between bulimia nervosa with and without a history of anorexia nervosa, there is little information. What information there is suggests that bulimic subjects with a history of anorexia nervosa are very similar to bulimic subjects without such a history in terms of eating

habits, concerns about weight, and associated psychopathology (Fairburn, 1984; Fairburn & Garner, 1986; Mitchell, Pyle, Eckert, Hatsukami, & Soll, 1990). Mitchell et al. (1990) did find, however, that bulimic subjects with a history of anorexia nervosa had a lower ideal weight, were more likely to abuse laxatives, were less likely to self-induce vomiting, and reported having been treated for depression more often than bulimic subjects without a history of anorexia nervosa. There is more evidence to suggest that there are differences between restrictive anorexics and bulimic anorexics. For instance, Strober (1981) found that anorexics with bulimia had higher levels of anorexic and other psychological symptoms than anorexics without bulimia. Parental personality characteristics and family psychiatric morbidity have also been found to differ between restrictive and bulimic anorexic samples (Strober, Salkin, Burroughs, & Morrell, 1982), as have other characteristics of the patients and their families. These findings will be discussed in detail in later sections.

It has further been suggested that bulimic anorexics and normal-weight bulimics are more similar to each other than they are to restrictive anorexics in terms of impulse-related behaviors, family variables, premorbid maximum weight, and weight- and eating-related variables (Garner, Garfinkel, & O'Shaughnessy, 1985). Similarly, Strober and Humphrey (1987) suggested that the psychopathology, weight tendencies, and interaction patterns of the family are distinctly different between bulimic and nonbulimic eating disorder subtypes.

Recently, a study was conducted which compared underweight, normal-weight, and overweight bulimic women with each other and with nonbulimic controls from all three weight categories (i.e., restrictive anorexics, normal controls, and obese controls; Shisslak, Pazda, & Crago, 1990). It was found that bulimic subjects at all three weight levels exhibited greater psychopathology and lower self-esteem than nonbulimic subjects at corresponding weight levels. Among the three bulimic groups, underweight bulimic subjects showed the greatest psychopathology. Thus, it appears that there are many differences between bulimic anorexics and restrictive anorexics, and that there may also be some differences between bulimic subjects of different weight levels.

Nonetheless, it should be pointed out that researchers also find many similarities among eating disorder groups. For instance, in both the Strober (1981) and Garner et al. (1985) studies cited above, there were no differences among eating disorder subgroups on a number of eating, personality, psychopathology, and family variables. It appears that in current research, one must attempt to delineate both the commonalities and the distinctions amongst eating disorder subgroups (e.g., Striegel-Moore et al., 1986).

In the present study, hypotheses are advanced for the group of eating-disordered subjects as a whole, as well as for subjects divided into eating disorder subtypes. There appear to be similarities between subjects with anorexia nervosa and bulimia nervosa, but there also appear to be differences,

especially between bulimic and nonbulimic subgroups. The present study investigated subjects with restrictive anorexia nervosa and subjects with bulimia nervosa. The bulimic-anorexic subgroup is of interest as well, but due to limited resources the priority of this study was to examine the two more distinct subgroups.

#### Eating Disorder Comorbidity

Another issue of importance in research on anorexia nervosa and bulimia nervosa is that of psychiatric comorbidity. For instance, symptoms of depression are reportedly common in anorexic (e.g., Kalucy et al., 1984) and bulimic subjects (e.g., American Psychiatric Association, 1987; Johnson et al., 1983; Russell, 1979). Based on individual and/or parental interviews, approximately 45% of 26 anorexic patients were diagnosed as having an affective disorder at follow-up an average of 5 years post-hospitalization (Cantwell, Sturzenberger, Burroughs, Salkin, & Green, 1977). No data were presented on presence or absence of binge-eating. Lee, Rush, and Mitchell (1985) reported that 52% of their sample of adult female bulimic subjects had a personal history of unipolar affective disorder, and Blouin, Zuro, and Blouin (1990) found that 62% of their bulimic sample met DSM-III criteria for lifetime history of major depression. Comparing eating disorder subtypes, researchers have not found significant differences among restrictive anorexic, bulimic anorexic, and bulimic subjects in terms of depressive symptoms (e.g., Garner et al., 1985; Strauss & Ryan, 1988; Wonderlich &

Swift, 1990b); however, Strober (1981) found a significant difference in terms of diagnosis of depression with 41% of bulimic anorexic subjects and 9% of restrictive anorexic subjects receiving DSM-III diagnoses of major depression.

Another diagnosis frequently reported to co-occur with bulimia nervosa is substance abuse disorder (e.g., American Psychiatric Association, 1987; Crisp, 1981; Pyle et al., 1981). Dykens and Gerrard (1986) found that bulimic subjects used alcohol and drugs more frequently and at an earlier age than control subjects, and Strober (1981) found alcohol use in 23% of bulimic anorexic adolescents and 0% of restrictive anorexic adolescents. Similarly, another study found that bulimic anorexics showed greater drug and alcohol use than restrictive anorexics (Piran, Lerner, Garfinkel, Kennedy, & Brouillette, 1988).

Personality disorder diagnoses have also been examined in eating-disordered groups. In a mixed eating disorder sample, and using DSM-III-R criteria, Wonderlich and Swift (1990a) found that 24% of subjects met criteria for borderline personality disorder, 48% of subjects met criteria for other personality disorders, and 28% of subjects received no personality disorder diagnosis. In a sample of 94 bulimic patients, 46% were found to have borderline personality features as assessed by a self-report inventory which measures DSM-III criteria for borderline personality disorder (Johnson, Tobin, & Enright, 1989). Another study was designed to compare personality disorder diagnoses between restrictive and

bulimic anorexics (Piran et al., 1988). These researchers found that 60% of the restrictive anorexic sample received diagnoses of avoidant personality disorder and 55% of the bulimic anorexic sample received diagnoses of borderline personality disorder. Thus, while there was heterogeneity of diagnosis within groups, a majority of restrictive anorexics showed social discomfort, fear of negative evaluation, and timidity, while a majority of bulimic anorexics showed instability of mood, interpersonal relationships, and self-image.

This comorbidity in eating-disordered populations raises the issue of the nature or direction of this association. It could be that the psychiatric symptomatology predisposes the individual to the development of an eating disorder or, conversely, that the eating disorder symptomatology may contribute to the development of other psychiatric disorders. On the other hand, other family, biological, or sociocultural factors could foster the development of both the eating- and non-eating-related psychopathology. Some authors have argued that eating disorders may be variant expressions or alternate forms of affective disorders (e.g., Cantwell et al., 1977; Hudson, Pope, Jonas, & Yurgelun-Todd, 1983; Lee et al., 1985). While recognizing and examining such comorbidity, the present study, rather than searching for similarities amongst disorders, will focus on determining family factors specific to anorexia nervosa and bulimia nervosa as distinct from other psychiatric disorders.

### Family Factors

Most writers agree that anorexia nervosa and bulimia nervosa are multidetermined disorders. That is, they are seen as resulting from a complex interaction of biological, personality, psychopathological, family, and sociocultural factors (e.g., Bruch, 1973; Garner & Garfinkel, 1980; Johnson, Connors, & Tobin, 1987; Mitchell & Eckert, 1987; Root, Fallon, & Friedrich, 1986; Strober & Yager, 1984). For instance, sociocultural factors such as pressures to be thin, discrimination against the obese, and female sex-role socialization may predispose women to the development of eating disorders (e.g., Boskind-White & White, 1987; Garner et al., 1984; Striegel-Moore et al., 1986). In combination with more specific family and individual factors (some perhaps genetic and/or biological) to be discussed in detail later, an eating disorder may be precipitated by social-emotional stressors such as the onset of adolescence with its pressures of increased separation, identity formation, sexuality, and bodily changes. Finally, biological factors such as the effects of starvation (e.g., Garner, Garfinkel, & Bemis, 1982; Kaplan & Woodside, 1987; Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950) and of persistent binge-eating and vomiting (e.g., Garner et al., 1984), along with individual, family, and sociocultural factors, may serve to perpetuate the eating disorder. Thus, it is highly unlikely that any single factor would account for all the aspects of anorexia nervosa or bulimia nervosa (e.g., Bemis, 1978; Chiodo, 1987). This is



the context in which the present study on family contributing factors must be viewed. While one may investigate one set of factors separately, it must be remembered that this is an artificial approach, and that no factor acts independently in these "etiologically complex syndromes" (Strober & Humphrey, 1987).

The literature on possible family contributing factors in anorexia nervosa and bulimia nervosa will now be reviewed. In particular, demographic factors, psychopathology of individual family members, and family interaction patterns and characteristics will be examined. While research findings may point to factors that contribute to eating disorders, they may also reflect effects on the family of having a daughter with an eating disorder. Certain family characteristics observed may be the results of a current family crisis rather than of preexisting family dysfunction. For instance, Kay, Schapira, and Brandon (1967) remind researchers to imagine how a "normal" parent would behave when faced with a daughter intent on self-starvation. And Bruch (1973, 1978) suggests that having an anorexic daughter may increase family anxiety, concern, annoyance, and resentment, and lead to the development of power struggles. Nonetheless, even if a family characteristic has developed in response to having an eating-disordered daughter and, thus, did not predispose the daughter to develop anorexia nervosa or bulimia nervosa, this does not necessarily diminish its importance: The characteristic in

question may be contributing to the maintenance of the daughter's eating disorder.

Demographics. Many authors report that a disproportionately large percentage of individuals with anorexia nervosa have middle or upper socioeconomic class backgrounds (e.g., Bemis, 1978; Bruch, 1973; Edwards, 1987). They are said to have been brought up in educated and prosperous homes (Bruch, 1984) in which family members are high achievers (Cooper, 1987), and status has been achieved rather than inherited (Hall, 1978). In samples of 41, 50, and 56 anorexic patients, 50% to 70% of patients' families have been found to be from the upper two socioeconomic classes, as compared with population norms for these two classes of 14% to 18% (Hall, 1978; Kalucy, Crisp, & Harding, 1977; Morgan & Russell, 1975). However, Heron and Leheup (1984) examined case records of anorexic and control patient adolescents and found no differences in socioeconomic class.

Some authors believe that there is an overrepresentation of the higher socioeconomic classes in individuals with bulimia nervosa as well as in those with anorexia nervosa (e.g., Boskind-White & White, 1987; Shisslak et al., 1987), whereas others believe that individuals with bulimia nervosa come from more diverse socioeconomic backgrounds (e.g., Cooper, 1987). Consistent with Heron and Leheup's (1984) results above, it has been suggested that both anorexia nervosa and bulimia nervosa are beginning to occur in individuals of more diverse socioeconomic backgrounds,

including those of the lower socioeconomic classes (e.g., Bruch, 1988; Selvini-Palazzoli, 1978; Shisslak et al., 1987). A survey of women in communities of different socioeconomic statuses found, contrary to expectations, that anorexia nervosa and bulimia nervosa were more common in lower income respondents than in upper income respondents (Pope, Champoux, & Hudson, 1987). More recently, researchers found no differences in social class or education between samples of bulimic and nonbulimic women (Dolan, Lieberman, Evans, & Lacey, 1990). Bruch (1988) suggests that, regardless of their socioeconomic class, the families of anorexic individuals have aspiration levels which are high relative to the socioeconomic class they occupy.

Apart from socioeconomic status, the demographic characteristics of the families of individuals with eating disorders are rarely noteworthy. No consistent differences have been reported with respect to family size, religious affiliation, or birth order (Dolan et al., 1990; Hall, 1978; Lacey, Gowers, & Bhat, 1991). Dolan et al. (1990) found bulimic women's parents to be older at the time of their daughter's birth than nonbulimic women's parents, whereas other researchers found no such difference (Kog & Vandereycken, 1985). Bruch (1973) has suggested that, if there were any demographic differences, it would be that anorexic individuals often come from female-dominated families with few sons. Hall (1978) reported that the families of 50 female anorexic patients included 112 daughters and 48 sons,

and it was recently reported that all-female sibships were overrepresented in a large sample of bulimic women (Lacey et al., 1991).

If demographic characteristics are found which discriminate between the families of eating-disordered and non-eating-disordered individuals, the mechanism by which they predispose individuals to develop anorexia nervosa or bulimia nervosa must be explicated. For instance, certain attitudes may be associated with higher socioeconomic status, such as achievement orientation or perfectionism, or, as some authors have suggested, pressures on women to be thin may be greater in the upper socioeconomic classes (e.g., Striegel-Moore et al., 1986; Wooley, Wooley, & Dyrenforth, 1979).

Psychopathology in family members. Various disorders have been reported to occur with increased prevalence in the biological relatives of individuals with anorexia nervosa or bulimia nervosa. Eating disorders themselves are thought to be more prevalent in relatives of eating-disordered individuals than in control populations (e.g., Mitchell & Eckert, 1987; Strober & Humphrey, 1987). For instance, researchers examined 30 pairs of female twins in which the proband had anorexia nervosa and found concordance rates for anorexia nervosa of 55% in monozygotic twins and 7% in dizygotic twins (Crisp, Hall, & Holland, 1985). This is in comparison with a maximum prevalence rate of anorexia nervosa of 1% in young women. Another study, however, described 11 female adolescent anorexic patients who were members of a

same-sex twin pair (5 monozygotic and 6 dizygotic) and found no concordance for anorexia nervosa (Waters, Beumont, Touyz, & Kennedy, 1990). It was unclear, however, on what basis diagnoses were determined in this study. Examining bulimia nervosa in female twins, researchers have found concordance rates for bulimia nervosa of 27% in dizygotic twins and 83% in monozygotic twins (Fichter & Noegel, 1990). Hsu, Chesler, and Santhouse (1990), with a much smaller sample and with no direct contact with the non-patient twin in almost half of the cases, found concordance rates for bulimia nervosa of 0% for dizygotic twins and 33% for monozygotic twins. Thus, on the basis of the twin studies, it appears that genetic factors may play a role in the pathogenesis of anorexia nervosa and bulimia nervosa. This will be discussed further at the end of this section.

Another study compared the rates of anorexia nervosa, bulimia nervosa, and subclinical anorexia nervosa in the first- and second-degree relatives of 60 female anorexic adolescents and 95 female nonanorexic adolescent psychiatric inpatients (Strober, Morrell, Burroughs, Salkin, & Jacobs, 1985). There were higher incidences of anorexia nervosa, bulimia nervosa, and subclinical anorexia nervosa in the relatives of anorexic adolescents than in the relatives of control adolescents. Some evidence of specificity was found in that all 4 diagnoses of severe restrictive anorexia were made in relatives of restrictive anorexic subjects, and 7 of the 9 diagnoses of bulimia nervosa or bulimic anorexia

occurred in relatives of bulimic anorexic subjects. Further data were then collected (Strober, Lampert, Morrell, Burroughs, & Jacobs, 1990), and the results corroborated the earlier finding in that there was a higher lifetime prevalence of eating disorders (anorexia nervosa in particular) in the relatives of adolescent probands with anorexia nervosa than in the relatives of probands with affective disorder or other types of psychiatric disturbance. Another study compared adult female probands with and without bulimia nervosa and found higher rates of eating disorders (bulimia nervosa in particular) in the first-degree relatives of the bulimic probands (Kassett, Gershon, Maxwell, Guroff, Kazuba, Smith, Brandt, & Jimerson, 1989).

It has also been suggested that obesity is common in the parents of bulimic and bulimic anorexic individuals, especially in the mothers (American Psychiatric Association, 1987; Kog & Vandereycken, 1985). Pyle et al. (1981) found that 23 of their 34 bulimic subjects had at least 1 obese first-degree family member; this included 13 mothers and 6 fathers. No control group was employed, however. Other researchers measured the heights and weights of 30 anorexic individuals' parents and did not find them to differ from those of 30 control subjects' parents (Halmi, Struss, & Goldberg, 1978).

Other psychiatric disorders have been investigated in the relatives of individuals with eating disorders. For instance, the American Psychiatric Association's (1987) diagnostic

manual notes that higher than expected frequencies of major depression are found in the first-degree relatives of bulimic individuals. Similarly, major depression and bipolar disorder are reported to be more frequent in the first-degree relatives of individuals with anorexia nervosa (American Psychiatric Association, 1987). There have been uncontrolled studies which have reported family histories of affective disorder in patients with anorexia nervosa (e.g., Cantwell et al., 1977; Kalucy et al., 1977) and bulimia nervosa (e.g., Lee et al., 1985; Pyle et al., 1981). Rivinus et al. (1984) found more depression in first- and second-degree relatives of anorexia nervosa patients than in the corresponding relatives of normal control subjects. Similarly, family history of affective disorder has been found to be greater in the families of patients with anorexia nervosa and/or bulimia nervosa than in the families of patients with schizophrenia or borderline personality disorder (comorbidly depressed subjects excluded) (Hudson et al., 1983). Recently, Strober et al. (1990) found higher rates of affective disorder among relatives of anorexic adolescents than among relatives of adolescents in a mixed psychiatric control group, but only if the anorexic adolescent had a coexisting affective disorder, thus suggesting a specific transmission of liability. In contrast, other researchers, comparing bulimic and nonbulimic probands, have found higher rates of affective disorder in the relatives of bulimic probands than in the relatives of nonbulimic probands regardless of history of affective disorder in the bulimic

proband (Kassett et al., 1989; Keck, Pope, Hudson, McElroy, Yurgelun-Todd, & Hundert, 1990), thus suggesting a possible common diathesis in bulimia nervosa and affective disorder. In general, rates of family history of affective disorder have been found to be similar for eating-disordered patients and patients with affective disorders (e.g., Hudson et al., 1983; Keck et al., 1990; Strober et al., 1990).

Research has also been conducted comparing the families of restrictive anorexic adolescents with those of bulimic anorexic adolescents (Strober, 1981; Strober et al., 1982). Using a structured diagnostic interview, mood disorder was found to be more prevalent in the first- and second-degree relatives of bulimic anorexic subjects than in those of restrictive anorexic subjects (Strober et al., 1982). Nine of 11 diagnoses of bipolar disorder were given to relatives of bulimic anorexic subjects. Prevalence of mood disorder was 23% in the mothers and 14% in the fathers of bulimic anorexics, as compared with 6% of the mothers and 3% of the fathers of restrictive anorexics. In a regression analysis, maternal and paternal depression, along with paternal impulsivity, were found to predict the greatest severity of bulimia.

Substance abuse, particularly alcoholism, has also been investigated in the family members of individuals with eating disorders. Uncontrolled studies have reported family histories of alcohol abuse in anorexic (e.g., Cantwell et al., 1977; Kalucy et al., 1977) and bulimic probands (e.g., Lee et



al., 1985; Pyle et al., 1981). Rivinus et al. (1984) found higher rates of substance use disorders in first- and second-degree relatives of anorexia nervosa patients than in the families of normal control subjects. Similarly, Kasset et al. (1989) found higher rates of alcohol abuse in the first-degree relatives of bulimic probands than in the first-degree relatives of normal control probands. In a review of the literature, Kog and Vandereycken (1985) reported that more alcoholism is found in the families of bulimic subjects than in the families of anorexic subjects (Kog & Vandereycken, 1985). For instance, the research cited above on depression in the families of restrictive anorexic and bulimic anorexic adolescents also examined the prevalence of substance abuse (Strober, 1981; Strober et al., 1982). Alcohol and drug abuse were found to be more prevalent in the families of bulimic-anorexic subjects.

Various characteristics besides depression and substance abuse have been investigated in the families of patients with eating disorders. In an uncontrolled study of 56 families of anorexic subjects, phobic avoidance was noted in 30% of the mothers and 11% of the fathers, marked obsessional traits were noted in 14% of the mothers and 29% of the fathers, and migraine headaches were noted in 30% of the mothers (Kalucy et al., 1977). In a controlled study, first-degree relatives of bulimic probands scored higher on 3 of 11 DSM-III-R personality disorder categories (histrionic, schizotypal, and obsessive-compulsive) than relatives of nonbulimic probands

did (Carney, Yates, & Cizadlo, 1990). In another controlled study, the fathers of bulimic anorexic subjects had higher scores on MMPI Infrequency, Psychopathic Deviate, and Hypomania scales than restrictive anorexics' fathers (Strober et al., 1982); the MMPI content scales Family Problems and Hostility were also higher in bulimic anorexics' fathers. The restrictive anorexics' fathers had higher scores on Masculinity-Femininity and Social Introversion scales. The mothers of bulimic anorexic subjects scored higher on MMPI Hypochondriasis, Depression, Family Problems, and Hostility scales than the restrictive anorexic subjects' mothers; and the mothers of the restrictive anorexic subjects had higher elevations of Masculinity-Femininity, Social Introversion, and the content scale Phobias. Strober (1981) also found that 50% of bulimic anorexic subjects' fathers and 50% of their mothers had diagnosable disorders according to a structured diagnostic interview, as compared with 14% of restrictive anorexic subjects' fathers and 18% of their mothers.

In summary, there is some well-controlled research suggesting that eating disorders may be more prevalent in the relatives of anorexic and bulimic patients than in the relatives of control patients. It has been suggested that obesity is common in the parents of bulimic individuals, but the one controlled study reviewed investigated the weights of anorexic subjects' parents and did not find them to differ from the weights of control subjects' parents. Depression and alcohol abuse may be more prevalent in the families of eating-

disordered patients than in the general population, and there is some evidence that these problems are more prevalent in bulimic and bulimic anorexics' relatives than in restrictive anorexics' relatives. Finally, on the MMPI, bulimic anorexics' fathers have been characterized as impulsive, bulimic anorexics' mothers have been characterized as depressed, and both have been characterized as hostile and involved in family conflict. Restrictive anorexics' mothers and fathers were depicted as introverted, and the mothers as phobic.

An issue to consider in this research is whether psychopathology, if any, in the parents might be contributing to the etiology of the eating disorder in the daughter, or whether the daughter's eating disorder might be contributing to the development of various disorders in the parents. Also to be noted in this research is that it is never the case that a disorder is seen in 100% of the anorexic or bulimic subjects' mothers or fathers, nor even that a positive family history for a disorder is found in 100% of the subjects. As similarly noted in the literature on personality characteristics of anorexic and bulimic individuals, Yager (1982) notes that there is great personality diversity in the family members of individuals with eating disorders.

Research on the psychopathology of family members raises the issue of genetic influences. Disorders such as depression and alcoholism are thought to have some genetic basis (e.g., Mitchell & Eckert, 1987), and the concordance rate in anorexic

and bulimic monozygotic twins raises the issue of hereditary factors in eating disorders. The interesting question thus arises of what factor might be inherited that could predispose one to develop an eating disorder. Regarding bulimia nervosa, it has been suggested that affective instability or a susceptibility to loss of control might be inherited (Hsu et al., 1990). With respect to anorexia nervosa, it has been postulated that phobic or avoidant personality traits -- such as high harm-avoidance, low novelty seeking, and high reward-dependence -- might be the inherited liabilities (Strober et al., 1990). This research, however does not rule out the influence of environmental or nongenetic factors. Most authors agree that researchers must consider how genetic factors interact with environmental factors, such as family interactions or attitudes, and the sociocultural context (e.g., Crisp et al., 1985; Strober & Humphrey, 1987). It is unlikely that either straightforward inheritance or direct modeling alone could account for the development of anorexia nervosa or bulimia nervosa (Strober & Humphrey, 1987).

Family characteristics and interaction patterns: Major theories. Several authors have formulated theories regarding the family characteristics and interaction patterns of individuals with eating disorders. The late Hilde Bruch (1973, 1978, 1984, 1988), writing from a psychodynamic perspective, suggested that the family interactions of anorexics only appear to be happy and harmonious. Family members are said to deny the existence of problems, portraying

family life and relationships as perfect. Bruch claimed that tensions lie beneath this facade of normality, but that expression of feelings, especially negative ones, is not allowed in these families. She asserted that, throughout the future-anorexic's childhood, the parents do not respond to the child's expressions of needs, wants, or feelings, but instead respond to their own erroneous perceptions of the child's needs. Independence is discouraged in the child, while excessive closeness, over-conformity, and obedience are perceived as ideal.

Bruch also claimed that these families have a success, achievement, and appearance orientation. The parents are said to have high achievement expectations and to view the future-anorexic child as academically and socially superior to her siblings. Many of the mothers may have been frustrated in their career aspirations by marriage, and become conscientious wives and mothers instead. Finally, Bruch suggested that the parents of anorexics may be unusually weight-conscious and preoccupied with dieting and appearance.

Minuchin and his colleagues suggest that anorexia nervosa is a psychosomatic disorder which maintains and is maintained by dysfunctional family systems or structures (e.g., Minuchin, Rosman, & Baker, 1978; Rosman, Minuchin, Baker, & Liebman, 1977; Sargent, Liebman, & Silver, 1984). Families which encourage somatization are said to be characterized by the following five attributes: enmeshment, overprotectiveness, rigidity, lack of conflict resolution, and involvement of the

child in parental conflict so as to avoid or suppress it. Enmeshment is characterized by overinvolvement, excessive closeness and loyalty, poor individuation, inference of others' feelings and thoughts, and lack of privacy. Overprotectiveness is exhibited in a high degree of concern for each other's welfare, hypersensitivity to signs of distress, and highly nurturant interactions. Enmeshment and overprotection result in reduced autonomy. Rigidity is reflected by a commitment to maintain the status quo and an inability to cope with change. Lack of conflict resolution may be the result of conflict avoidance or diffusion, or of open conflict which family members are unable to resolve. The parents of anorexic children are said to avoid conflict more often than the parents of children with other psychosomatic disorders. Minuchin and his co-workers also report that the anorexic's entire family exhibits special concerns around eating, diets, table manners, and food fads. Schwartz, Barrett, and Saba (1984) have reported that the families of bulimic individuals also exhibit the five attributes of Minuchin's psychosomatic families, plus consciousness of appearances, isolation, and attaching special meanings to food and eating.

Selvini-Palazzoli (1978) has proposed formulations about the families of anorexics from a systems perspective which overlap with those of Bruch and Minuchin. The parents are said to be concerned with appearances and norms, and to give the superficial impression of having a mature emotional

relationship with each other. They do not acknowledge their disillusionment with each other. Criticism is not permissible in the family. The family group is more important than the individual, with self-sacrifice being viewed positively and self-indulgence negatively. The parents satisfy their perceptions of the child's needs, not the child's actual needs, with the result that the child feels she has no control over her life, and any increase in her autonomy becomes anxiety-provoking for both her and her parents. The family is isolated and overprotective, and rigidly resists change. Selvini-Palazzoli also reported that all 12 of the families she had treated had tried to maintain traditional sex-role values especially with regard to division of labor within the family.

More recently, a systems formulation of bulimia nervosa has been advanced (Fallon & Root, 1986; Root et al., 1986). These authors suggest that bulimics' families are enmeshed and have difficulties resolving autonomy/intimacy conflicts. There are family rules regarding which feelings are permissible, and when and how to express them. Intense feelings are difficult for these families to cope with and conflict is avoided or left unresolved. Weight and appearance are important, and there are multigenerational patterns revolving around food, dieting, and weight. These authors also suggest that the family is critical as a messenger of societal expectations of the feminine role. The family is said to mirror the inequities of power between men and women

in society, with the fathers being powerful and the mothers powerless. The daughters are said to be determined to live lives different from those of their mothers.

Root et al. (1986) have also described three types of bulimic families which are said to share the above characteristics but to differ along other dimensions. They are the Perfect Family, the Overprotective Family, and the Chaotic Family. Characteristics of the Perfect Family include: an emphasis on appearances, family reputation, family loyalty, and achievement; discouragement of expression of negative feelings; perfectionism; need for approval and acceptance by others; and rigid family rules. Attributes of the Overprotective Family include age-inappropriate overprotection of children, and lack of trust in people outside the family. The Overprotective and Perfect Family formulations are somewhat similar. Finally, the Chaotic Family is characterized by: inconsistent rules; physical or emotional unavailability of one or both parents; sexual, physical, or emotional abuse; substance abuse and impulsivity; frequent and inappropriate expressions of anger; and distrust, pseudoautonomy, and depression.

Other authors have suggested that similar family types exist in the families of anorexic individuals. Martin (1983) reported that 20 families of her sample of 25 families of anorexic patients were enmeshed, overprotective, and lacked conflict resolution. She was able to categorize these 20 families into two subgroups on the basis of the mechanisms



they used to handle conflict. One subgroup was labeled Denial, with families claiming to have no problems; the other was labeled Escalation, with families claiming to have too intense and too numerous problems to resolve. Denial families were characterized as perfect families with conscientious, overachieving members. The two subgroups seem parallel with the Perfect and Chaotic Family types, respectively. The socioeconomic status (SES) of the Denial families was higher than the population average, whereas the SES of the Escalation families did not differ from that of the general population. The patients were also younger in the Escalation families than in the Denial families; however, there were no differences in duration of illness.

Strober and Yager (1984) have similarly observed two subgroups of anorexic families. One subgroup is characterized by excessive cohesion, limited outside contacts, low emotional expressivity, and a lack of permissiveness. The other subgroup's attributes are high conflict, broken homes, anger and marital discord, and threats of abandonment. Again, parallels with Perfect/Overprotective and Chaotic Family types are noteworthy.

Family characteristics and interaction patterns:  
Clinical data. The above theories suggest the following family issues may be associated with eating disorders: enmeshment, overprotection, and independence/dependence conflicts; lack of conflict resolution; "perfect" versus chaotic family presentations; marital relationship problems;

achievement orientation; traditional sex roles; and importance of weight and appearance. Similar characteristics and interaction patterns are apparent in the clinical literature.

For instance, regarding enmeshment, overprotection, and independence/dependence conflicts, many authors have described the families of anorexic and bulimic individuals as loyal and cohesive (e.g., Dare, 1985; Roberto, 1986; Wooley & Kearney-Cooke, 1986; Wooley & Wooley, 1984). This is said to cause problems during adolescence when progress towards separation from the family, autonomy, individuation, and identity formation is expected (e.g., Kalucy et al., 1984; Wooley & Kearney-Cooke, 1986; Wooley & Wooley, 1984). The family may only permit certain feelings to be felt and certain cognitive models to be adopted, preventing the child from recognizing her own feelings or developing a sense of personal identity (e.g., Guidano, 1988; Guidano & Liotti, 1983). Psychoanalytic and developmental object relations writers hypothesize that parenting problems begin in infancy and include expecting the child to conform to the parents' needs, and not tolerating aggression or attempts to separate (e.g., Sours, 1974; Stern 1986). It has also been suggested that the parents have never individuated from their own parents (Humphrey & Stern, 1988; Stern, Whitaker, Hagemann, Anderson, & Bargman, 1981).

Enmeshment issues have also been described in various clinical samples. For instance, Morgan and Russell (1975) reported that excessive emotional dependence, especially between mother and daughter, was common in their sample of 41

anorexic patients. Similarly, Kaffman (1987; Kaffman & Sadeh, 1989) found overly dependent or enmeshed mother-daughter relationships in over three-quarters of a sample of 66 anorexic (restrictive and bulimic combined) patients, and compared this with a rate of 34% in an unspecified psychiatric control group. Data were obtained through interviews and unspecified questionnaires. From their experience with a parents of anorexics support group, Lewis and MacGuire (1985) reported that closeness between mothers and daughters was a theme in the groups, but that they had observed more pronounced closeness between autistic children and their mothers. Finally, Norris and Jones (1979) evaluated 10 anorexic patients and their families via interviews, a questionnaire, family therapy, and parent groups, and reported on characteristics found in at least 9 families. Patients would not say anything negative about their families, dyadic relationships were enmeshed, members claimed to share values and goals, and independence strivings of the adolescent were not expressed.

Various authors have also suggested that communication problems are common in the families of anorexic and bulimic individuals (e.g., Guidano & Liotti, 1983). Parents may conceal problems and avoid expressing personal emotions and opinions (Guidano, 1988), or family members may be poor at communicating about emotions (Rakoff, 1983). The family may not tolerate the expression of negative feelings and instead encourage their suppression (e.g., Edwards, 1987; Orbach,

1986; Wooley & Wooley, 1984). Dare (1985) suggested that the problem is lack of conflict resolution which may occur in the context of conflict avoidance or unending arguments. In their sample of 10 anorexic patients and their families, Norris and Jones (1979) found a lack of conflict resolution. Noordenbos (1987) gave questionnaires to 108 anorexic individuals and 79 dieting women and interviewed 37 of the anorexics. Parents of anorexics were reported to be less able to express positive and negative emotions, and to talk less and more negatively about bodily development and sexuality. The anorexics were less able to express emotions and opinions, and were more conforming and approval-seeking.

The distinction between perfect and chaotic families has been linked to eating disorder subtypes. Most authors suggest that the families of bulimic and bulimic anorexic individuals are more conflicted, disorganized, and abusive, whereas the families of restrictive anorexic individuals are more cohesive and pseudoharmonious (e.g., Garner et al., 1984; Kalucy et al., 1984; Kog & Vandereycken, 1985; Wooley & Wooley, 1984). However, it has also been suggested that bulimics' families present in an idealized and problem-free manner (Humphrey & Stern, 1988), and Kaffman and Sadeh (1989) reported that, of six pairs of sisters concordant for anorexia nervosa, five pairs were comprised of one restrictive anorexic and one bulimic anorexic. In Norris and Jones's (1979) sample of 10 anorexic patients and families, an idealized family myth of closeness, absence of conflict, and harmony was exhibited. In

a sample of 56 families with an anorexic member, the early developmental history was presented as trouble-free (Kalucy et al., 1977). And in a parents of anorexics support group, after 2 years parents were still unwilling to consider that certain family dynamics might be contributing to the eating disorder (Lewis & MacGuire, 1985). In a sample of 172 bulimic women, 47% were found to have a history of child sexual abuse (29%) or child physical abuse (29%) (Root & Fallon, 1988), and in another sample of 35 bulimic women, 34% reported a history of family child sexual abuse (Bulik, Sullivan, & Rorty, 1989). Similarly, another research group has found a history of childhood sexual abuse in 31% of a sample of 158 eating disordered clients (Palmer, Oppenheimer, Dignon, Chaloner, & Howells, 1990). No associations were found between the rate or type of abuse and the eating disorder subtypes. Mothers of bulimic women have also been reported to have been victims of child sexual abuse at a higher than expected rate (Root et al., 1986).

Finally, in terms of family interaction patterns, the parents' marital relationship has been described by various authors. It has been suggested that the parents of individuals with eating disorders rarely divorce despite having poor relationships (Guidano & Liotti, 1983). Parents of bulimics are believed to have conflictual relationships and higher rates of divorce, whereas parents of anorexics are believed to show pseudoharmony and covert conflict in their relationships (e.g., Gordon, Beresin, & Herzog, 1989; Roberto,

1986; Schwartz et al., 1984; Wooley & Wooley, 1984). In clinical samples of parents of anorexics, authors report marital relationship problems (e.g., Lewis & MacGuire, 1985; Norris & Jones, 1979; Taipale, Tuomi, & Aukee, 1971). For instance, Morgan and Russell (1975) reported that there was serious disharmony between the parents in 24% of their sample of 41 anorexics. And Kalucy et al. (1977) reported that in 41% of their sample of 56 families of anorexics, parents never or rarely had sexual relations. Kaffman (1987) reported divorce rates of 6% of restrictive anorexics' parents and 33% of bulimic anorexics' parents, as compared with a general population divorce rate of 19%. However, failing marriages or marital conflict were reported in 50% of the restrictive anorexic sample, versus 25% of the bulimic anorexic sample.

There are also clinical data and descriptions regarding characteristics of the families of individuals with eating disorders besides their interaction patterns. For instance, the families of anorexics are said to have high achievement expectations (e.g., Edwards, 1987), and the families of bulimics are said to value success and achievement, and have high standards of achievement in many domains (e.g., Humphrey & Stern, 1988; Roberto, 1986). In their sample of 10 anorexic patients and their families, Norris and Jones (1979) reported that the families valued status and achievement and had high expectations regarding work, sports, and moral issues. Similarly, mothers of 13 anorexics were reported to have high expectations for their daughters (Taipale et al., 1971).

The transmission of cultural sex role attitudes by the family may also be an important factor in eating disorders (Wooley & Wooley, 1984). It has been suggested that the parents of bulimics may strongly emphasize women conforming to traditional female sex role characteristics (Mizes, 1985), or that parents may show rigid polarization of sex-role stereotypic traits (Wooley & Kearney-Cooke, 1986). Fathers may be powerful, successful, and emotionally distant, while mothers may be powerless and nurturant, and have abandoned careers (e.g., Boskind-White & White, 1987; Wooley & Kearney-Cooke, 1986). Similarly, anorexic women may have been raised in families with strong patriarchal values or stereotypic parental gender role models (Edwards, 1987; Gordon et al., 1989). Noordenbos (1987) found that anorexic women reported that there was a strong traditional division of roles between their parents.

The family may also augment societal values on thinness and appearance (Boskind-White & White, 1987; Garner & Bemis, 1984). For instance, the anorexic individual's family members may be concerned with issues of weight, fitness, eating, and dieting (e.g., Bemis, 1978; Goodsitt, 1974; Taipale et al., 1971), and these issues may have special family meanings of self-control, self-esteem, and emotional expression (Kalucy et al., 1984). Similarly for bulimic individuals, family members may reinforce the adolescent's obsession with her shape, weight, and appearance (e.g., Boskind-White & White, 1987; Humphrey & Stern, 1988; Roberto, 1986; Striegel-Moore et al.,

1986). In a sample of 56 families of anorexics, disturbed eating habits were found in 23% of the families (Kalucy et al., 1977). There was a history of low adolescent weight, weight phobia, or anorexia nervosa in 16% of mothers and 23% of fathers; and 27% of mothers and 16% of fathers were dieting as adults. Kaffman and Sadeh (1989) reported that 83% of restrictive anorexics' and 58% of bulimic anorexics' parents showed preoccupation with food, weight, and dieting for reasons of health or aesthetics. And in a parents of anorexics support group, mothers and some fathers reportedly shared their daughters' fears that they would lose control and begin overeating (Lewis & MacGuire, 1985).

Family characteristics and interaction patterns:

Controlled studies. While the above theories and data are suggestive, little can be concluded from them because of methodological problems such as lack of control groups or normative data, unspecified dependent measures, and the retrospective nature of patient reports. However, there has been some better-controlled research conducted on the characteristics and interaction patterns of the families of eating-disordered individuals.

Heron and Leheup (1984) compared the case records of 16 adolescent anorexics and 40 adolescent control patients. They found no differences between groups in the number of intact families (12 of 16 anorexics, 27 of 40 control patients). There were significant differences between groups in: degree of closeness in the family (15/16 anorexics versus 10/40



control patients had families in which members spent most of their spare time together); exclusivity of family (13/16 anorexics versus 5/40 control patients); external stresses on the family (4/16 versus 32/40); and satisfaction with family relationships (14/16 versus 9/40 happy with their family).

Goldstein (1981) compared 11 anorexics' families with data on families in which an offspring developed schizophrenia. The anorexics' parents did not exhibit the combination of high communication deviance and high negative affective style common to the schizophrenics' parents. Criticism was not observed in any of the anorexics' family discussions. Goldstein also compared the anorexics' families with 5 nonanorexic inpatients' families and found the anorexics' parents to be more dependent and insecure. Neither Goldstein (1981) nor Heron and Leheup (1984) described in detail how their constructs were operationalized.

Some researchers have attempted to operationalize Minuchin's variables of enmeshment, rigidity, overprotectiveness, and lack of conflict resolution. For instance, Kog and Vandereycken (1989) compared 30 eating-disordered patients' families with 30 normal controls' families and found that the eating-disorder families showed more conflict avoidance on behavioral tasks than the control families. In addition, anorexic daughters perceived their families as more cohesive than bulimic and control daughters did, whereas bulimic daughters perceived more disorganization in their families than anorexic or control daughters did.

Harding and Lachenmeyer (1986) administered the Structural Family Interaction Scale (Perosa, Hansen, & Perosa, 1981) to 30 adult anorexics and 30 college control subjects. This scale was intended to measure Minuchin's constructs of enmeshment, overprotectiveness, and rigidity. No differences were found.

Sights and Richards (1984) administered structured interviews to 6 bulimic and 6 nonbulimic college women with and without their parents present. Blind raters coded the transcripts using the Parental Characteristics Rating Scale, an instrument developed for the purposes of the study. Bulimics' mothers were judged to be more domineering and controlling, and to have higher expectations of their daughters. Both parents of the bulimic women were thought to be more demanding and likely to compare siblings openly. With a larger sample of 38 bulimic women and 40 normal control women and also employing a questionnaire specifically devised for use in the study, Dolan et al. (1990) found that bulimics reported less parental attention and affection towards them and greater parental marital conflict than the comparison group. No differences were found regarding emphasis on academic achievement or importance of traditional female roles.

Recently, a number of research groups (McNamara & Loveman, 1990; Steiger, Liquornik, Chapman, & Hussain, 1991; Waller, Slade, & Calam, 1990b) have investigated the family functioning of eating-disordered subjects using the Family

Assessment Device (Epstein, Baldwin, & Bishop, 1983). This measure has seven subscales--general family functioning, problem-solving, roles, communication, affective responsiveness, affective involvement, and behavior control--and has respondents describe their family as it was while they were growing up. McNamara and Loveman (1990) compared the reports of 30 bulimic, 61 repeat dieter, and 59 nondieter undergraduate women and found that the bulimic subjects described their families as more enmeshed and intrusive, more emotionally disengaged or unresponsive to members' needs, less skilled in communication and problem-solving, and less structured or rule-governed than the control subjects. Another research group found similar results with the Family Assessment Device with 30 control, 34 bulimic, and 14 anorexic adult female subjects and their parents (Waller et al., 1990b). Anorexic and bulimic subjects rated their families as more dysfunctional than the control subjects did on all of the subscales of the test; however, the eating-disordered subjects' mothers rated their families as more dysfunctional on only two subscales, and there were no group differences amongst fathers. Steiger et al. (1991) also found no differences between adult restricter and binger eating-disorder subtype subjects on the Family Assessment Device, but did find that eating disorder subjects perceived their families as being less well-functioning than control subjects did.

Sixteen families with a bulimic anorexic daughter (mean age 18 years) and 24 families of women with no psychological problems were observed in mother-father-daughter triads using the Marital Interaction Coding System (MICS; Robin & Weiss, 1980) and the Structural Analysis of Social Behavior (SASB; Benjamin, 1974) (Humphrey, Apple, & Kirschenbaum, 1986). The MICS is a cognitive-behavioral coding system and the SASB is based on interpersonal theory. Both the cognitive-behavioral and interpersonal coding systems discriminated between groups. In particular, bulimic anorexics' families were seen as more negative, less positive, and more contradictory in communication. There were no differences in problem-solving. Humphrey (1989) also employed the SASB observational system with 16 restrictive anorexic, 16 bulimic, 18 bulimic anorexic, and 24 normal control subjects (mean age 18 years) and their parents. Restrictive anorexic subjects' parents were reported to communicate a mixed message of nurturant affection combined with neglect of their daughter's needs; bulimic subjects' relationships with their parents were reportedly hostile; and normal control subjects' parents were observed to be helpful and positive toward their daughters. No distinct pattern was observed in the bulimic anorexic group.

Wonderlich and Swift (1990b) employed the SASB self-rating scales with 11 restrictive anorexic, 26 normal-weight bulimic, 11 bulimic anorexic, and 29 control adult female subjects. They did not find the eating disorder subtype differences they had predicted regarding control/submission or

attack/hostile withdrawal. They did find that bulimia subtype subjects perceived their parental relationships as more hostile than control subjects did. Also using the SASB self-rating scales, Humphrey (1986b) found eating disorder subtype differences amongst 20 restrictive anorexic, 20 bulimic, 20 bulimic anorexic, and 20 control subjects (mean age 19 years). Bulimic subjects perceived greater deficits in parental nurturance than did subjects in the other three groups. Bulimic and bulimic anorexic subjects also perceived less parental empathy and nurturance than did control subjects. Both anorexic and bulimic subjects perceived greater parental blaming, rejecting, and neglecting than control subjects did.

Lucido and Abramson (1988) gave the Sexual Events Questionnaire, which measures adverse sexual experiences before age 12 years, and the Bulimia Test, which measures DSM-III-defined bulimia, to 125 bulimic or nonbulimic women. There were 63 questionnaires returned from 16 bulimic and 47 nonbulimic women (mean age 34 versus 23 years). Childhood sexual experiences were reported by 69% of bulimic and 70% of nonbulimic women. However, bulimic women reported more sexual experiences with fathers or brothers, a greater number of sexual experiences, and more fear or shock reactions to the events. For instance, 2 or more negative sexual experiences were reported by 46% of bulimic versus 6% of nonbulimic subjects. Also, 100% of the bulimic women kept the experiences secret as compared to 64% of the nonbulimic women.

Researchers compared 30 adult restrictive anorexic women with 38 bulimic anorexic women on the Childhood Events Questionnaire (CEQ) (Piran et al., 1988). The CEQ (Barnes, Ennis, & Trachtenberg, 1985) measures events occurring in subjects' families during childhood. Bulimic anorexics' families in childhood were characterized by greater financial problems, unemployment, interpersonal violence between parents and towards children, disagreement with parents, and substance abuse in a parent or sibling. Adult-child sexual abuse occurred in 8% of the bulimic anorexics' families and criminal convictions occurred in 5% of the bulimic anorexics' families; these events were never reported in the families of restrictive anorexics. No socioeconomic class differences were found between the groups.

Five recent studies have been conducted using the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown,, 1979). This instrument measures how individuals remember their parents from childhood, and consists of Care (warmth, affection, empathic responsiveness) and Protection (control, overprotectiveness, intolerance of autonomy) subscales. One study included 56 bulimic women and 30 control women (Pole, Waller, Stewart, & Parkin-Feigenbaum, 1988). Bulimic women perceived their mothers as less caring than nonbulimic women did. Similarly, Fichter and Noegel (1990) found that 27 bulimic twins perceived less maternal and paternal care, and more maternal and paternal overprotection than control subjects. Other researchers administered the PBI to 35

anorexic and 37 bulimic women, and compared their scores to published data on 40 normative subjects (Palmer, Oppenheimer, & Marshall, 1988). Anorexic and bulimic women had lower perceived maternal Care scores and bulimic women had lower paternal Care scores. Another research group gave the PBI to 31 anorexic, 34 bulimic with a history of anorexia, 33 bulimic without a history of anorexia, and 242 control adult female subjects (Calam, Waller, Slade, & Newton, 1990). The eating-disordered women recalled less maternal and paternal care and more paternal overprotection than did control women. Contrasting the individual clinical groups, bulimic subjects with a history of anorexia were found to perceive their fathers as less caring, while bulimics without such a history perceived both parents as less caring. Finally, the PBI was given to 15 restrictive anorexics, 9 bulimic anorexics, 21 normal-weight bulimics, 13 bulimics with a history of anorexia, and 24 non-eating-disordered women (Steiger, Van der Feen, Goldstein, & Leichner, 1989). The eating-disordered women perceived less paternal caring.

Other researchers have administered the Family Assessment Measure (FAM; Skinner, Steinhauser, & Santa-Barbara, 1983) to the families of eating-disordered individuals. This measure has the following subscales: Task Accomplishment, Role Performance, Communication, Affective Expression, Affective Involvement, Control, Values and Norms, and Social Desirability. In one study, the FAM was administered to 41 adolescent anorexics (restrictive and bulimic mixed) and their

parents, and 24 nonanorexic adolescents and their parents (Garfinkel et al., 1983). In the anorexic group, the mothers and daughters scored in a significantly more pathological direction on Task Accomplishment, Role Performance, Communication, and Affective Expression, and had significantly lower scores on Social Desirability, than the nonanorexic group mothers and daughters. There were no differences for fathers. Garner et al. (1985) administered the FAM to 59 bulimic anorexic, 59 normal-weight bulimic, and 59 restrictive anorexic adult women. The two bulimic groups had scores above T-values of 60 on six of the seven FAM subscales (excluding Role Performance); the restrictive group had no elevations above 60. Differences between groups were significant for all seven subscales. The Social Desirability subscale was analyzed separately, showing the restrictive anorexic group to have higher scores than the bulimic groups.

In the Garfinkel et al. (1983) study above, the Eating Attitudes Test (EAT), Restraint Scale, and body size estimation and satisfaction measures were also administered to parents and daughters. Parents showed no differences with respect to abnormal attitudes to weight control and dieting, or body size estimation or satisfaction on these measures. A more recent study, however, did find differences in weight- and eating-related behaviors and attitudes between a group of 39 mothers of adolescent daughters who reported a level of disordered eating comparable with clinical bulimic samples and a group of 38 mothers whose daughters reported a low level of



eating disturbance (Pike & Rodin, 1991). Compared with mothers of non-eating-disordered daughters, mothers whose daughters were eating disordered had higher scores on a composite of the Drive for Thinness, Bulimia, and Body Dissatisfaction subscales of the Eating Disorder Inventory, began dieting at a younger age, thought their daughters should lose more weight, and rated their daughters as less attractive than the daughters judged themselves. The mothers did not differ with respect to current Body Mass Index, maximum weight loss, desired weight loss, or ratings of their own attractiveness and weight.

Finally, the Family Environment Scale (FES) has been used in a number of studies. The FES has 10 subscales: Cohesion, Expressiveness, Conflict, Independence, Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation, Moral-Religious Emphasis, Organization, and Control (see Table 1 for definitions). Johnson and Flach (1985) administered the FES to 105 adult bulimic patients and 86 nonbulimic college students. The bulimic subjects perceived their families as lower on Cohesion, Expressiveness, Independence, Intellectual-Cultural Orientation, Active-Recreational Orientation, and Moral-Religious Emphasis, and as higher on Conflict. There were no differences in Achievement Orientation, Organization, and Control. In a regression analysis, Organization and Achievement Orientation were important predictors of severity of bulimia, along with three eating-related measures.

Table 1

FES Subscale Definitions


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1. Cohesion	the degree of commitment, help, and support family members provide for one another
2. Expressiveness	the extent to which family members are encouraged to act openly and to express their feelings directly
3. Conflict	the amount of openly expressed anger, aggression, and conflict among family members
4. Independence	the extent to which family members are assertive, are self-sufficient, and make their own decisions
5. Achievement Orientation	the extent to which activities are cast into an achievement-oriented or competitive framework
6. Intellectual- Cultural Orientation	the degree of interest in political, social, intellectual, and cultural activities
7. Active- Recreational Orientation	the extent of participation in social and recreational activities
8. Moral-Religious Emphasis	the degree of emphasis on ethical and religious issues and values
9. Organization	the degree of importance of clear organization and structure in planning family activities and responsibilities
10. Control	the extent to which set rules and procedures are used to run family life

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Note. Based on Moos & Moos, 1986 (p. 2).

Another research group employed the FES with a sample of 24 normal-weight bulimic (without a history of anorexia nervosa), 13 bulimic anorexic, and 41 normal control adult female subjects (Shisslak, McKeon, & Crago, 1990). They found that both bulimic groups characterized their families as less cohesive, less expressive, less oriented toward social and recreational activities, and more conflictual than the control group did. The bulimic anorexic subjects perceived their families as less encouraging of independence than the normal-weight bulimic and control subjects did.

Strauss and Ryan (1987) administered six subscales of the FES (Cohesion, Expressiveness, Conflict, Independence, Organization, and Control) to 19 restrictive anorexics, 14 bulimic anorexics, and 17 women without eating disorders. The anorexic groups perceived less expressiveness and cohesion than the control group, and the restrictive anorexics perceived more conflict than the control subjects. Strober (1981) examined FES scores in the families of 22 bulimic anorexic and 22 restrictive anorexic adolescents. The parents jointly completed the FES trying to disregard changes due to the anorexia nervosa. The bulimic anorexics' family environments were characterized as less cohesive and organized and as more conflicted than the restrictive anorexics' families. The Short Marital Adjustment Test was also administered with instructions to depict the marriage as it was before the onset of anorexia. Parents of the bulimic anorexics reported higher marital discord. And in a

semistructured family interview, bulimic anorexic girls were rated as more distant from their parents than restrictive anorexic girls.

Stern et al. (1987) administered the FES to 114 women and a parent of each (all but 2 were mothers). There were 20 restrictive anorexics, 13 bulimic anorexics, 24 normal-weight bulimics without a history of anorexia, and 57 age-matched control subjects. Subjects were instructed to respond to the FES based on how the family was when the daughter was living at home. In all the eating disorder groups, daughters rated their families as less expressive than control daughters did. Restrictive anorexic daughters had lower Active-Recreational Orientation scores than control daughters, and bulimic and bulimic anorexic daughters had lower Cohesion scores than control daughters. The parents of bulimic anorexics perceived more family conflict than control parents. Finally, bulimic daughters perceived greater Achievement Orientation than control daughters, and the parents of bulimics perceived greater Achievement Orientation than the parents of bulimic anorexics. There was also a significant interaction such that eating-disordered daughters rated their families as higher on Achievement Orientation than their parents did, whereas control daughters rated their families as lower on this scale than their parents did.

Two studies have involved administering the FES along with the Family Adaptability and Cohesion Evaluation Scale (FACES; Olson, Bell, & Portner, 1978). The FACES is intended

to measure the degree of perceived family cohesiveness and adaptability, and to describe a range of family functioning from chaotically disengaged to rigidly enmeshed. Ordman and Kirschenbaum's (1986) study included 25 bulimic women and 36 control women. On the FES, bulimics had lower Cohesion, Expressiveness, and Active-Recreational Orientation scores, and higher Conflict scores than control subjects. On the FACES, bulimics were lower on Cohesion and Social Desirability. In a discriminant function analysis, FES Independence discriminated best between groups. Humphrey (1986) administered these scales to 16 bulimic anorexics and their parents and 24 nondistressed family triads. The mean age of the daughters was 18 years. The FES and FACES items were factor analyzed and only factor scores were compared in the study; thus, results are not directly comparable to those of other studies. There were 8 FES and 8 FACES factors. Bulimic anorexics' families were characterized by mothers, fathers, and daughters as less involved and supportive (FES and FACES), more isolated and nondisclosing (FES and FACES), and as being more detached and having poorer boundaries (FACES). Bulimic daughters characterized their families as more conflictual (FES and FACES) and unstructured (FES). Another research group administered the FACES to 41 eating-disordered and 27 control adult female subjects (Waller, Slade, & Calam, 1990a). They found that the eating-disorder group perceived their families as lower in adaptability and cohesion than the control group did.

Some more recent research with the FES has examined whether the perceived family environment of bulimic women varies with level of depression, borderline personality disorder features, or history of childhood sexual abuse and, therefore, may not be directly associated with the eating disorder per se (Blouin, Zuro, & Blouin, 1990; Bulik et al., 1989; Johnson, Tobin, & Enright, 1989). Blouin et al. (1990) administered the FES to 81 depressed bulimic, 18 non-depressed bulimic, and 37 normal control subjects. They found that the depressed bulimic women characterized their families as less cohesive, less active in recreation, and more controlling than the nondepressed bulimic or control women did. Depressed bulimic subjects also perceived their families as less expressive, less encouraging of independence, and more achievement-oriented than control subjects did.

Johnson et al. (1989) administered the FES to 43 bulimic patients with borderline personality features and 27 nonborderline bulimic patients. The borderline personality bulimic women described their families as less cohesive, less expressive, more conflictual and controlling, less independence-encouraging, and less oriented toward intellectual or recreational activities than the nonborderline bulimic women did. And, finally, Bulik et al. (1989) compared the responses of bulimic women who had (n=12) or did not have (n=23) a history of family childhood sexual abuse and found that the sexual abuse group described their families as less cohesive, less emphasizing of moral or religious issues, and

more conflictual. It is of note that the level of bulimic symptomatology was very similar between groups in all three studies, regardless of status with respect to depression, borderline features, or sexual abuse history, again suggesting a lack of association between eating disorder status and reported family environment.

Wonderlich and Swift (1990a, 1990b) have conducted research similar to the above but employing the Structural Analysis of Social Behavior rather than the FES, and examining a mixed anorexic and bulimic eating disorder group rather than bulimics only. For instance, these researchers compared eating-disordered female adult subjects with borderline personality disorder (n=11), with other personality disorders (n=22), or with no personality disorder (n=13) to 29 normal control subjects (Wonderlich & Swift, 1990a). They found that the borderline personality disorder eating-disordered subjects perceived greater hostility in their parental (especially maternal) relationships than subjects in the three other groups. Other personality disorder eating-disordered subjects perceived greater hostility in their parental relationships than normal control subjects on some measures. Similarly, dividing eating disorder subjects into high (n=34) and low (n=14) dysthymia groups, these investigators found that only the dysthymic subjects perceived greater hostility in their parental relationships than did controls (Wonderlich & Swift, 1990b).

To summarize the controlled studies, many researchers have employed the FES with adult female samples and results have consistently portrayed the families of women with bulimia and bulimic anorexia as less cohesive and expressive than control families. Women with bulimia nervosa have also fairly consistently been shown to perceive their family environments as more conflictual and less active and recreationally oriented than controls. The majority of the FES research has focused on adult or young adult women with bulimia nervosa or bulimic anorexia. Two studies included restrictive anorexic women and consistently found that these women described their families as less expressive than controls (Stern et al., 1987; Strauss & Ryan, 1987). Other findings with the FES have been less consistent, and no researchers have administered the instrument to subjects in early adolescence. The one study on early adolescents involved administration of the FES to their parents (Strober, 1981). It is of note that this has been the only one of three possible FES studies to find restrictor/binger differences. In total, three studies have examined the responses of parents on the FES: A fairly consistent finding has been that the parents of bulimic and bulimic anorexic subjects portray their families as less cohesive and more conflictual than the parents of restrictive anorexic or control subjects do (Humphrey, 1986; Stern et al., 1987; Strober, 1981). Finally, recent evidence has suggested that the family environments described by bulimic women may not be associated with their eating disorder status per se,



but rather with their level of depression, borderline personality disorder features, or history of family sexual abuse.

Researchers using other measures have provided evidence that the families of restrictive anorexics appear harmonious and satisfied whereas the families of bulimics and bulimic anorexics appear conflictual and chaotic. There have been inconsistent results in studies directly comparing restrictive and bulimic eating disorder subtypes regarding the existence of restricter/binger differences in family interaction. There has been one attempt to measure the sex role attitudes in bulimic families: No difference from control families was found (Dolan et al., 1990). The two attempts at measuring eating- and weight-related attitudes in the parents of adolescents with eating disorders have yielded inconsistent results (Garfinkel et al., 1983; Pike & Rodin, 1991). Achievement attitudes have been measured via the FES and results have been inconsistent. In one study (Sights & Richards, 1984), bulimics' mothers were rated as having higher expectations of their daughters than nonbulimics' mothers; however, there were only 6 families in each group so results were tentative. Another study found no differences in perceptions of family achievement orientation between bulimic and control subjects (Dolan et al., 1990).

A few methodological issues regarding this research are important to note. For instance, one must distinguish between studies which investigate the eating-disordered woman's

perception of her family and those which actually examine the behavior or attitudes of other family members as well. Less than half (30%) of the studies reviewed in this section involved both the eating-disordered daughter and one or both of her parents. Another consideration is whether the daughter is an adolescent who still lives with her parents, or is an adult and/or no longer living at home. The vast majority (85%) of studies reviewed herein involved adult subjects. Related to this is the issue of whether the subject is responding on the basis of her present situation, or is being asked to retrospectively describe her childhood, or respond as if she were still living at home or did not have an eating disorder. To overcome the problem of retrospectivity of subject reports, one could have adolescents who live with their parents respond to measures so as to reflect their current experience. This would also yield information on the family characteristics present in the early stages of an eating disorder.

A final problem is the lack of psychiatric control groups in these studies, making it unclear whether findings are specific to eating disorders or reflect patterns which would contribute to a wide range of disorders. Regarding the FES results, it has been suggested that the results found for bulimics' families may be similar to what would be found for other distressed families (Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986). The family interaction pattern formulations themselves may not be specific to eating

disorders. For example, Bruch's theories were meant to encompass certain cases of obesity and schizophrenia, and Minuchin's constructs pertain to psychosomatic diabetic and asthmatic as well as anorexic cases. The formulations do not explain why a disorder of eating in particular should appear (e.g., Strauss & Ryan, 1987; Strober & Humphrey, 1987; Yager, 1982). Perhaps the postulated family characteristics of weight and appearance consciousness, traditional sex roles, or achievement orientation would be present in the families of eating-disordered individuals more often than in the families of adolescents with other disorders. Currently, however, there is no controlled evidence regarding this hypothesis.

#### Summary and Hypotheses

Regarding family factors associated with eating disorders, it had been suggested that anorexics and possibly bulimics came from the upper socioeconomic classes and/or from families with high aspiration levels; however, more recent research suggests that individuals with eating disorders may come from diverse socioeconomic backgrounds. Eating disorders may be more prevalent in the relatives of eating-disordered individuals than in the general population. Also, the parents of bulimics and bulimic anorexics may have higher rates of depression and alcoholism and be more impulsive than the parents of restrictive anorexics. Similarly, bulimic individuals themselves may be more depressed and impulsive, and use alcohol more than restrictive anorexic individuals.

Theoretical formulations and clinical data have suggested a number of family characteristics and interaction patterns as possibly contributing to anorexia nervosa and bulimia nervosa. Family interaction patterns include enmeshment, overprotection, and independence/dependence conflicts; lack of conflict resolution; perfect versus chaotic family presentations; and marital relationship problems. There is some support from controlled studies that the families of restrictive anorexics appear cohesive and harmonious whereas the families of bulimics and bulimic anorexics appear conflictual and disengaged. Recent evidence suggests that the family environment associated with bulimia may be a function of subjects' level of depression, borderline personality features, or sexual abuse history rather than a function of the eating disorder. The family characteristics suggested by the theoretical and clinical literature include achievement orientation, traditional sex roles, and importance of weight and appearance. Little controlled research has addressed these issues and that which has has yielded inconsistent results. Methodological issues in the research on family factors include lack of psychiatric control groups, retrospectivity of reports of adult subjects, and lack of direct study of parents.

In an attempt to contribute to the literature on family factors in anorexia nervosa and bulimia nervosa, the present study included four groups of female adolescents and their mothers: restrictive anorexic, bulimic type, psychiatric

control, and nonpsychiatric control. Including control families in which the daughter is presenting for treatment for reasons other than an eating disorder yields information regarding the specificity of family characteristics to anorexia nervosa and bulimia nervosa. The selection of adolescents rather than adult women with eating disorders overcomes to a large extent the problem of retrospectivity of self-report and enables one to investigate family variables during the early stages of an eating disorder. Including mothers as well as daughters provides two perceptions of the family environment and allows comparison of these different perceptions. Another contribution of this study was to examine the family characteristics of achievement orientation, traditional sex roles, and importance of weight and appearance, as well as the family interaction patterns more commonly investigated.

Thus, the aim of the present study was to investigate the characteristics and interaction patterns present in the families of adolescent eating-disordered patients, as perceived by both the adolescent and her mother, and to determine which, if any, of these family factors are specific to anorexia nervosa or bulimia nervosa. Consistent with the theoretical formulations and some of the research results reported above, the specific hypotheses are as follows:

1. The families of bulimic type and psychiatric control subjects will be characterized as more dysfunctional than the families of nonpsychiatric control subjects, whereas the

families of restrictive anorexic subjects will be characterized as more similar to the families of nonpsychiatric control subjects.

2. The restrictive anorexic and bulimic type mothers and daughters will be characterized as higher in achievement orientation, traditional sex role ideology, and weight and appearance orientation than the psychiatric control mothers and daughters.

## Method

### Subjects

Four groups of female adolescents--restrictive anorexic, bulimic type, psychiatric control, and nonpsychiatric control--participated with their mothers in this study. There were 97 mother-daughter pairs in total, the majority (94%) of whom were Caucasian. The recruitment strategies, criteria for inclusion, and resulting number of pairs per group will now be described.

Nonpsychiatric control subjects were recruited through notices posted in high school newsletters, local newspapers, and community centers. To be included in the study, daughters could not meet DSM-III-R criteria for anorexia nervosa or bulimia nervosa, have a history of such a diagnosis, or score above the cut-off point (i.e., 20) on the Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), a widely used measure of the symptoms of anorexia nervosa and bulimia nervosa. In addition, daughters could not have a history of treatment for psychological problems. Similarly, no sibling in the family could have a history of treatment for psychological problems or be known to have had an eating disorder. On these bases, 8 of the 32 mother-daughter pairs recruited were excluded from the analyses of the study--5 because the daughter had a history of treatment for psychological problems and 3 because a sibling had been or was receiving treatment for psychological problems.

Psychiatric control subjects were recruited through mental health centers and hospital-based psychiatric treatment services where they were being seen at that time for non-eating-related psychological problems (excluding schizophrenia or bipolar disorder). Presenting problems included depression, anxiety-related disorders, and defiance-oppositionality. To be included in the study, daughters had to meet the same criteria regarding lack of eating disorder diagnosis and symptoms that the nonpsychiatric control daughters did. Similarly, their siblings could not be known to have had an eating disorder. They were not excluded, however, on the basis of a sibling having a history of treatment for psychological problems. The application of these criteria resulted in 5 of the 25 mother-daughter pairs recruited being excluded from the analyses of the study. One daughter had a probable history of anorexia nervosa, one had a history of bulimia nervosa, and three had scores above the cut-off on the Eating Attitudes Test.

Restrictive anorexic and bulimic type subjects were recruited from a hospital-based adolescent eating disorder treatment center where they were being seen at that time for treatment. To be included in the restrictive anorexic group, daughters had to meet the DSM-III-R diagnostic criteria for anorexia nervosa, but not for bulimia nervosa (current or past). At the time of participation, however, many subjects' weights were no longer 85% below that expected for their age and height as participation was usually requested after



treatment had been ongoing for some time. For this reason, the criteria were adjusted such that a documented weight prior to participation of less than 85% of that expected was required. To be included in the bulimic type group, daughters had to meet or have recently met DSM-III-R criteria for bulimia nervosa. The reason for including subjects who no longer met the full diagnostic criteria was that, as mentioned above, many participants had been in treatment for some time and had begun to make progress in overcoming some of their eating disorder symptomatology. Utilizing the diagnostic criteria for eating-disordered subjects as delineated above, 6 of the 40 mother-daughter pairs recruited were excluded from the analyses of the study. Two daughters met criteria for anorexia nervosa but also reported bulimic symptomatology, and four daughters did not meet criteria for anorexia nervosa or bulimia nervosa.

The inclusion criteria described in the preceding paragraphs were developed with the aim of achieving four distinct groups based on the status of the female adolescents therein. The resulting number of mother-daughter pairs per group are as follows: restrictive anorexic  $n=20$ ; bulimic type  $n=14$ ; psychiatric control  $n=20$ ; and nonpsychiatric control  $n=24$ . The clinical characteristics (eating/weight-related and psychiatric symptomatology-related) of the female adolescents within these groups will be presented in the Results section. Demographic data and treatment-related information regarding the groups will now be presented.

Demographic data for the four groups are presented in Table 2; treatment-related information for the three clinical groups is presented in Table 3. One-way analyses of variance (ANOVAs) were conducted on the eight continuous measures (daughter's age, mother's age, average parental education, total parental income, number of children, treatment duration, previous treatment duration, and duration of disorder), with alpha set at .05. The Type I error rate (alpha) was not made more stringent (i.e., adjusted for the number of measures) as it was important to detect any potentially confounding variables. As the number of subjects per group was unequal, the homogeneity of variance assumption was assessed by Bartlett's test and, where found untenable, corrected for by the Welch procedure (Glass, Peckham, & Sanders, 1972; Howell, 1982). Significant ANOVAs were followed by Tukey multiple comparisons with alpha set at .05. The Tukey-Kramer adjustment for unequal Ns was employed (Kirk, 1982). The Tukey test was also adjusted via the Games-Howell procedure in cases of violation of the assumption of homogeneity of variance (Kirk, 1982). For the dichotomous measures (single versus married maternal status, history of hospitalization, and history of psychotropic medication), analyses of variance of proportions were conducted with alpha set at .05. Significant results were followed by the multiple comparison technique recommended by Marascuilo (1966), which holds alpha at the .05 level experiment-wise.

Table 2

Demographic Data Means (Standard Deviations)

	Restrict. Anorexic	Bulimic Type	Psych. Control	Nonpsych. Control
Age- Daughter	15.05 (1.23)	16.36 (1.28)	14.90 (1.52)	15.04 (1.76)
Age- Mother	41.90 (5.65)	45.64 (6.03)	41.25 (5.16)	43.54 (3.62)
Average Parental Education	13.78 (2.95)	14.32 (2.44)	13.75 (2.78)	16.08 (2.31)
Total Parental Income (thousands)	82.50 (64.01)	78.93 (60.56)	43.75 (25.83)	79.83 (46.92)
Number of Children	2.75 (1.12)	2.64 (0.84)	2.40 (1.05)	2.42 (0.88)
Single Mothers	20.0%	14.3%	45.0%	16.7%

Table 3

Treatment-Related Information Means (Standard Deviations)

	Restrictive Anorexic	Bulimic Type	Psychiatric Control
Treatment Duration	10.40 (13.82)	7.14 (5.71)	10.55 (9.16)
Previous Treatment Duration	4.25 (6.39)	1.64 (3.99)	10.65 (17.01)
Duration Disorder	22.15 (14.04)	23.21 (11.47)	35.20 (19.74)
History of Hospital.	60.0%	14.3%	10.0%
History of Medication	30.0%	21.4%	15.0%

Note. Durations are in months.

With regard to the demographic data, the above analyses showed significant group differences on three of the six measures. The ANOVA for daughter's age was significant ( $F(3, 74) = 3.21, p < .05$ ), with multiple comparisons showing that bulimic type daughters were significantly older than psychiatric control daughters. The ANOVA for mother's age was not significant. The average parental education ANOVA was significant ( $F(3, 74) = 3.95, p < .05$ ), with nonpsychiatric control parents completing a significantly higher average number of years of education than restrictive anorexic or psychiatric control parents. The adjusted-for-heterogeneity ANOVA for total parental income was significant ( $F'(3, 35) = 5.10, p < .01$ ), with parental income for nonpsychiatric control subjects being significantly greater than that for psychiatric control subjects. As outlying extreme scores may influence mean income values, medians were also calculated for total parental income: These were 66.0 for restrictive anorexic, 64.0 for bulimic type, 42.5 for psychiatric control, and 70.5 for nonpsychiatric control. The ANOVA for number of children was not significant, nor was that for marital status.

Regarding the treatment-related data, analyses revealed significant group differences on two of the five measures. The ANOVA for duration of disorder was significant ( $F(2, 51) = 3.99, p < .05$ ), with multiple comparisons indicating that psychiatric control subjects' duration of disorder was significantly longer than restrictive anorexic subjects'. The corrected-for-heterogeneity analyses for treatment duration

and previous treatment duration did not reach significance. Similarly, the analysis for history of psychotropic medication did not reveal significant group differences. The analysis for history of hospitalization, however, was significant ( $\chi^2(2) = 15.87, p < .005$ ), with multiple comparisons indicating that significantly more restrictive anorexic daughters had a history of hospitalization than did bulimic type or psychiatric control daughters.

Finally, it should be noted that it had originally been planned to collect data for each family from fathers as well as from mothers and daughters. The sole inclusion criterion for parental participation was that the parent had been living with the daughter since her birth. Due to the high rate of divorce in the sample, this inclusion criterion resulted in a much lower availability of fathers than mothers. Thus, by excluding fathers no longer living in the home and stepfathers, the potential number of fathers available was as follows: restrictive anorexic  $n=11$ ; bulimic type  $n=11$ ; psychiatric control  $n=8$ ; and nonpsychiatric control  $n=19$ . In addition, there was also a lower rate of participation for fathers than for mothers such that the actual number of fathers participating was: restrictive anorexic  $n=9$ ; bulimic type  $n=6$ ; psychiatric control  $n=3$ ; and nonpsychiatric control  $n=10$ . This small number of fathers would yield unstable means and provide insufficient power for analysis. Thus, it was not possible to provide comparative family data on fathers in this study.

## Measures

In order to test the hypotheses of the study, operationalizations of the following constructs were needed: family system/interaction and family sociocultural milieu (i.e., achievement orientation, sex role ideology, and attitude toward weight and appearance). Family system/interaction was defined by scores on the Cohesion, Expressiveness, Conflict, Independence, Organization, and Control subscales of the Family Environment Scale (FES; Moos & Moos, 1986), and by the Dyadic Adjustment Scale total score (DAS; Spanier, 1976). Achievement orientation was defined by scores on the Work and Family Orientation Questionnaire (WFOQ; Helmreich & Spence, 1978) and by the Achievement Orientation subscale of the FES. Sex role ideology was defined by scores on the Sex-Role Ideology Scale (SRIS; Kalin & Tilby, 1978). Attitudes toward weight and appearance were defined by scores on the Food Fitness and Looks Questionnaire (FFL; Hall, Leibrich, & Walkey, 1983) and the Body Esteem Scale (BES; Franzoi & Shields, 1984). A background information form, a brief interview, the Eating Attitudes Test (EAT-26; Garner et al., 1982), and the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) were used to characterize subjects and ensure appropriate group composition.

Family Environment Scale. The Family Environment Scale (FES; Moos & Moos, 1986) consists of 90 items to which subjects must respond true or false. The following ten 9-item subscales comprise the test: Cohesion, Expressiveness,

Conflict, Independence, Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation, Moral-Religious Emphasis, Organization, and Control (see Table 1, p. 49, for definitions). The FES can be administered to individuals of age 11 years and older (Moos, 1987).

The internal consistencies (Cronbach alphas) of the subscales have been reported to range from .61 to .78 ( $M = .71$ ), and 2-month test-retest reliabilities of .68 to .86 ( $M = .78$ ) have been reported (Moos & Moos, 1986). The FES is also sensitive to environmental change in families (Moos, 1987), and discriminates between normal and distressed families (Moos & Moos, 1986). In the FES manual, Moos and Moos (1986) present extensive evidence of the subscales' validity.

Dyadic Adjustment Scale. The Dyadic Adjustment Scale (DAS; Spanier, 1976) is a 32-item measure of the quality of marital relationships. It yields a total score as well as four factor-analytically derived subscales: Dyadic Satisfaction, Dyadic Cohesion, Dyadic Consensus, and Affectional Expression. Cronbach alphas were reported of .96 for the total scale and .73 to .94 for the subscales (Spanier, 1976). The DAS has been shown to discriminate between married and divorced individuals (Spanier, 1976).

Work and Family Orientation Questionnaire. The Work and Family Orientation Questionnaire (WOFO; Helmreich & Spence, 1978) is a measure of achievement motivation consisting of 23 items which form four factor-analytically derived subscales. One subscale, Personal Unconcern (4 items), has not shown



adequate reliability or validity and was not be used in the present study. The three remaining subscales are: Work (the desire to work hard); Mastery (preference for challenging tasks); and Competitiveness (enjoyment of interpersonal competition). The items are responded to on a 5-point Likert scale with points labeled "Strongly agree," "Slightly agree," "Neither agree nor disagree," "Slightly disagree," and "Strongly disagree."

Cronbach alphas were reported of .61 to .76 for the three subscales of the WOFO (Helmreich & Spence, 1978). Construct and predictive validation evidence was presented and suggests that achievement motivation is not a unitary construct and, thus, use of a total score is not recommended (Helmreich & Spence, 1978). More recently, J. T. Spence (personal communication, June 6, 1989) reported that the three factor subscales of the WOFO have been verified in confirmatory analyses and that acceptably high alphas for the three subscales have also been repeatedly verified.

Sex-Role Ideology Scale. The Sex-Role Ideology Scale (SRIS; Kalin & Tilby, 1978) is a 30-item measure of prescriptive beliefs about behavior appropriate for men and women. Sex role ideology is conceived as a dimension with a feminist and a traditional pole. Statements are responded to on 7-point scales labeled from "Disagree strongly" to "Agree strongly." A median reliability of .79 (amongst restricted and wide range samples) was reported based on split-half reliability and item-total correlations (Kalin & Tilby, 1978).

Test-retest reliability was .87. A more recent study reported internal consistencies of .82 to .85 for single-sex samples (Cota & Xinaris, 1989). The scale has discriminated between groups of feminist and traditional women (Kalin & Tilby, 1978), and showed evidence of construct and predictive validity (Leichner & Kalin, 1981).

Food Fitness and Looks Questionnaire. The Food Fitness and Looks Questionnaire (FFL; Hall et al., 1983) was developed to measure attitudes to and importance of weight, appearance, eating, and fitness postulated to exist in the families of patients with eating disorders. Fifty-two statements are responded to on a 5-point Likert scale with points labeled "Definitely agree" to "Definitely disagree." Five subscales were derived by factor analysis. Three of these subscales (35 items) are relevant to the hypotheses of the present study: Weight, Appearance, and Fitness. The Cronbach alphas for these subscales are .88, .92, and .84 respectively (Hall et al., 1983). Some validity data were also presented; however, the scale was only administered to mothers of nonpatient daughters.

Body Esteem Scale. The Body Esteem Scale (BES; Franzoi & Shields, 1984) is a multidimensional measure of people's attitudes toward their bodies. The scale consists of a list of 35 body parts or functions which subjects must rate on a 5-point scale from "Have strong negative feelings" to "Have strong positive feelings," according to how they feel about their own bodies.

Factor analyses led to the development of three subscales which differ somewhat for male and female subjects. They are labeled Physical Attractiveness, Upper Body Strength, and Physical Condition for men and Sexual Attractiveness, Weight Concern, and Physical Condition for women. The corresponding Cronbach alphas for women are .78, .87, and .82 (Franzoi & Shields, 1984). Corresponding three-month test-retest reliabilities are .78, .79, and .81 for women (S. L. Franzoi, personal communication, November, 1991). Validity evidence was presented which supported the multidimensional structure (Franzoi & Herzog, 1986; Franzoi & Shields, 1984).

Background information forms. Background information forms given to daughters included items regarding demographic characteristics, eating disorder symptoms (operationalized DSM-III-R diagnostic criteria), and impulse-related behaviors (as adapted from Garfinkel, Garner, & Moldofsky, 1980). The impulse-related clinical features coded on a yes/no basis were as follows: cigarette use, alcohol use, street drug use, stealing, self-harm, suicide attempt, mood swings, and sexual intercourse. The total number of these behaviors reported was employed as an indication of impulsivity or acting out. Background information forms given to mothers included items regarding demographic characteristics only.

Weight status. Indices of relative weight status were derived from the information obtained regarding mothers' and daughters' weights. (As will be described in the Procedure subsection, while mothers' weights were self-reported,

daughters' weights were measured either by the investigator or by the primary clinician.) For both mothers and daughters, the Body Mass Index (BMI) was calculated as weight in kilograms divided by height in meters squared as delineated by the Metropolitan Life Insurance Company (1984). The BMI is a measure of degree of overweight which is highly correlated with direct measures of body fat (Metropolitan Life Insurance Company, 1984). For mothers, the percentage of average body weight for height was calculated based on the Metropolitan Life Insurance Company's (1983) table of standard weights. This method is inappropriate for the daughters in the study as it is intended for those aged 25 years and older. Therefore, the percentage of average body weight for height and age for daughters was calculated using adolescent norms as adapted from Forbes (1972).

Interview. A brief interview was used to solicit information regarding daughters' duration of disorder and treatment, and previous treatment history; to ensure appropriate group status in the present study; and to determine the composition of the family.

Eating Attitudes Test. The Eating Attitudes Test (EAT-26; Garner & Garfinkel, 1979; Garner et al., 1982) is a 26-item index of the symptoms of anorexia nervosa and bulimia nervosa. Respondents must indicate whether each item refers to them "always," "usually," "often," "sometimes," "rarely," or "never." The three responses in the most "anorexic" direction to an item are scored 3, 2, and 1, while the

remaining three responses are scored 0. The scale is commonly used with adolescent subjects (e.g., Rosen et al., 1988; Williams, 1987).

The EAT-26 has shown acceptable reliability, with Cronbach alphas reported of .90 for an eating-disordered sample and .83 for a female comparison sample (Garner et al., 1982). Validation studies have shown the EAT-26 to discriminate between eating-disordered and non-eating-disordered samples, to detect undiagnosed eating disorder cases (Garner et al., 1982), and to be correlated with measures of restrained eating and dieting behavior (Rosen, Silberg, & Gross, 1988).

Brief Symptom Inventory. The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982) is a 53-item psychological symptom inventory. Respondents indicate how much they are distressed by various problems on a 5-point scale (0 [not at all] to 4 [extremely]). The inventory may be administered to respondents 13 years of age and older.

The BSI yields 9 primary symptom scale scores and 3 global indices of distress. The General Severity Index (GSI) is described as the single best indicator of overall current distress level derived from the BSI. For the purposes of the present study, the General Severity Index (GSI) and Depression scale score were employed.

The BSI is a shortened version of the Symptom Check List-90-Revised (Derogatis, 1977). Its symptom scales correlate

from .92 to .99 ( $\bar{M}$  = .96) with the corresponding scales of the parent instrument (Depression scale .95). Cronbach alphas for the 9 symptom scales range from .71 to .85 ( $\bar{M}$  = .78; Depression scale .85), and 2-week test-retest reliabilities range from .68 to .91 ( $\bar{M}$  = .81). Test-retest reliabilities are .90 for the GSI and .84 for the Depression scale. Evidence of construct and criterion-related validity was also presented (Derogatis & Spencer, 1982).

### Procedure

Clinical subjects (i.e., restrictive anorexic, bulimic type, and psychiatric control) were initially approached by their primary clinician and given an initial contact letter which described the study. If they gave permission to be contacted, the investigator was given their names and phone number and called them to further describe the study and request their participation. Nonpsychiatric control subjects who saw the notice regarding the study, and wished to participate, contacted the investigator directly.

Subjects participated in the study in one of the following locations: at the center in which they had their appointments with their primary clinician; in their family home; or at the investigator's university-based psychology department. When subjects arrived at the study, the investigator described the study to them, informed them of the confidentiality of results (including inter-family member confidentiality), and familiarized them with the questionnaires. Written consent forms were then given to

subjects to sign. After providing consent, subjects filled in the questionnaires in the following order: FES, WOFO, FFL, SRIS, BES, EAT-26 (daughters only), BSI (daughters only), DAS (parents only), Background information form (separate daughter and parent forms). The investigator was present and available to answer questions the subjects might have had. The brief interview was then conducted with daughters, and non-eating-disordered daughters were weighed. (Restrictive anorexic and bulimic type daughters' weights were obtained from their primary clinician.) Subjects then had any questions they may have had regarding the study answered. If they requested it, a general summary of the results of the study was sent to them upon the study's completion. Daughters were also given a small gift as a token of appreciation for participating in the study (e.g., tickets for the local cinema, planetarium, or aquarium).

## Results

A factorial design with repeated measures on one factor was employed in the present study. Specifically, a 4(Group) X 2(Relation) between-within groups design was utilized. It is a correlational study in that the levels of the factors are organismic rather than experimentally manipulated variables. The four levels of the Group factor (with their associated number of mother-daughter pairs) are as follows: restrictive anorexic (n=20); bulimic type (n=14); psychiatric control (n=20); and nonpsychiatric control (n=24). The two levels of the Relation factor are daughter (n=78) and mother (n=78). This design enables one to analyze differences amongst the four groups, differences between mothers and daughters, and interactions between the two factors.

The hypotheses of the present study are divided into two groups--family system/interaction hypothesis and family sociocultural milieu hypotheses. These hypotheses are primarily tested with the 4 X 2 design described above, with the result that the following variables are entered into the analysis: FES-Cohesion, FES-Expressiveness, FES-Conflict, FES-Independence, FES-Organization, and FES-Control; WOFO-Work, WOFO-Mastery, WOFO-Competitiveness, and FES-Achievement Orientation; SRIS; FFL-Weight, FFL-Appearance, FFL-Fitness, BES-Attractiveness, BES-Weight Concern, and BES-Physical Condition. To obtain comparability with the existing literature, the three remaining subscales of the FES (Intellectual-Cultural Orientation, Active-Recreational



Orientation, and Moral-Religious Emphasis) were also included in the analysis, with the result that there were a total of 20 dependent measures in the main analyses of this study.

Because of the large number of dependent variables used in this study, a multivariate approach to the analysis was taken. A multivariate analysis of variance (MANOVA), utilizing the Wilks's lambda test statistic with the standard F-approximation and with alpha set at .05, was conducted before proceeding to univariate F-tests. MANOVA is commonly employed as protection against an excessive experiment-wise Type I error rate in cases of multiple dependent measures; however, there is some disagreement in the statistical literature as to whether MANOVA is appropriately used in this manner (e.g., Harris, 1975; Huberty & Morris, 1989). It is argued that the initial MANOVA may not hold the experiment-wise error rate at alpha. Thus, in the present study, an initial MANOVA was conducted for purposes of comparability with extant literature but was not assumed to provide Type I error rate protection. Also, due to unequal *N*s, the analysis could not be assumed to be robust to violations of the homogeneity of variance-covariance matrices assumption (Hakstian, Roed, & Lind, 1979) and, therefore, Box's M test was conducted to assess the viability of this assumption.

Significance on the multivariate analysis of variance was followed by univariate analyses of variance (ANOVAs) to determine which individual dependent measures yielded significant differences. If each of these ANOVAs were

conducted with alpha set at .05, the family-wise Type I error rate would be unacceptable; therefore, the Bonferroni inequality was employed to hold the family-wise error rate at an upper bound of 10% (i.e., .10 divided by the number of dependent measures). Due to the unequal  $N$ s, Box's test, a generalization of Bartlett's test for homogeneity of variance (e.g., Kirk, 1982), was conducted at the univariate level to test the assumption of multisample sphericity of the variance-covariance matrices. Significant ANOVAs were followed by multiple comparisons conducted via the Tukey method with alpha set at .05 experiment-wise. The Tukey-Kramer adjustment for moderately unequal  $N$ s was employed (Kirk, 1982).

The above approach to the analyses of this study is the result of a consideration of potential Type I and Type II errors. In a study with multiple dependent measures, there is an inflated risk of Type I errors; specifically, the actual alpha has an upper bound of alpha multiplied by the number of dependent measures. Particularly with correlational research, in which random assignment is impossible, interpreting multiple tests with .05 significance levels may result in non-replicable and spurious findings. On the other hand, correlational clinical research studies are also prone to low power and, therefore, an inflated risk of Type II errors because of the difficulties in subject recruitment with resultant low  $N$ s, and because of the lack of control over extraneous variation. In the present study, the approach to the analyses was planned with the goal of compensating for the

inflated risk of Type I errors without forfeiting all chances of achieving a significant result should the null hypothesis be false. Hence, the family-wise error rate of the multiple ANOVAs was set at .10 rather than .05 (to decrease the probability of Type II errors), and the Bonferroni inequality was employed to modify alpha (to decrease the probability of Type I errors). Similarly, a conservative multiple comparison procedure was used, but with a standard rather than modified alpha.

The statistical analyses of the hypotheses of the study will be described in detail shortly. Before proceeding to this description, however, analyses of the clinical characteristics of the groups will be presented. Following presentation of the results of the tests of the study's hypotheses, some additional analyses of potential interest will be briefly described. All analyses followed the general plan of approach described above. The only notable exception is that in some cases a one-way design rather than two-way between-within design was appropriate and, therefore, Bartlett's test of the homogeneity of variance assumption was employed at the univariate level rather than Box's test for multisample sphericity.

#### Clinical Characteristics

In this section, analyses of the eating- and weight-related and psychiatric distress-related clinical characteristics of the female adolescents in the four groups will be presented. The purpose of these analyses is to

determine the extent to which the recruitment strategies and selection criteria resulted in the desired group compositions. The ten eating- and weight-related measures were: height, current weight, percentage of average body weight for age and height (%ABW), minimum percentage of average body weight for age and height (minimum %ABW), body mass index (BMI), maximum weight, minimum weight at current height, ideal or desired weight, dissatisfaction with current weight, and score on the Eating Attitudes Test (EAT-26). The three psychiatric distress-related measures were: the Brief Symptom Inventory General Severity Index score (BSI-GSI), the Brief Symptom Inventory Depression scale score (BSI-Depress), and the total number of impulse-related behaviors reported (IMPULSES).

A one-way MANOVA was conducted on these 13 clinical characteristics' measures. This MANOVA was significant ( $F(39, 184.34) = 4.43, p < .001$ ); however, the Box's M test was also significant suggesting a violation of the assumption of homogeneity of variance-covariance matrices. This heterogeneity was examined as suggested in Hakstian et al. (1979). Examination of the four generalized variances with respect to  $N$  revealed the negative condition whereby the smaller samples are associated with the greater dispersion, and a liberally-biased test will result. Comparing the results obtained with the results of the empirical sampling distributions presented in Hakstian et al. (1979), however, suggested that the present MANOVA, given its high level of significance and mildly to moderately unequal  $N$ s, was unlikely

to reflect a situation of a true null hypothesis. Also, using Pillai's criterion, which is reported to be more robust than Wilks's lambda (Tabachnick & Fidell, 1983), the MANOVA was still significant at the  $p < .001$  level. Univariate tests will, therefore, be reported. These tests were conducted with a modified alpha of .008 (i.e., .10 divided by 13).

Eating- and weight-related measures. Means for the ten eating- and weight-related measures are presented in Table 4. The ANOVAs for height and for maximum weight, and the corrected-for-heterogeneity ANOVA for dissatisfaction with current weight, were nonsignificant. The remaining seven ANOVAs were significant.

The results with current weight ( $F(3, 74) = 8.33, p < .001$ ) showed that restrictive anorexic subjects had significantly lower weight than female adolescents in the other three groups, as did the corrected-for-heterogeneity results with percentage of average body weight ( $F'(3, 36) = 15.56, p < .001$ ). Similarly, the corrected-for-heterogeneity result for Body Mass Index ( $F'(3, 35) = 19.46, p < .001$ ), a measure of overweight, showed that the restrictive anorexic subjects had significantly less body weight or body fat than the subjects in the three other groups. In addition, the results with minimum weight ( $F(3, 74) = 18.81, p < .001$ ) and for minimum percentage of average body weight ( $F(3, 74) = 25.45, p < .001$ ) showed that the minimum weight of the restrictive anorexic subjects was significantly lower than that of the subjects in the other three groups. The result for ideal weight ( $F(3, 74)$

= 8.17,  $p < .001$ ) showed that the restrictive anorexic female adolescents' desired weight was significantly less than the psychiatric and nonpsychiatric control subjects'. Finally, the results of the corrected-for-heterogeneity analysis of the

Table 4

Daughters' Eating- and Weight-Related Means (Standard Deviations)

	Restrict. Anorexic	Bulimic Type	Psych. Control	Nonpsych. Control
Height- inches	64.75 (2.63)	64.71 (2.97)	64.40 (2.70)	64.50 (2.78)
Weight- pounds	104.55 (15.02)	129.43 (16.90)	130.80 (24.30)	129.29 (19.83)
%ABW	89.30 (9.18)	110.50 (18.41)	111.75 (19.96)	110.33 (15.71)
Minimum %ABW	73.10 (10.41)	94.36 (10.40)	101.55 (14.13)	100.46 (11.70)
BMI	17.40 (1.60)	21.79 (3.64)	22.10 (3.73)	21.83 (3.20)
Maximum Weight	116.45 (18.36)	139.71 (17.69)	133.30 (24.00)	132.25 (21.36)
Minimum Weight	85.30 (16.91)	110.86 (10.55)	118.85 (18.26)	117.50 (16.63)
Ideal Weight	96.60 (17.74)	108.57 (11.55)	115.05 (14.38)	117.17 (14.04)
Dissatis- faction	7.55 (17.71)	17.50 (14.87)	14.55 (20.96)	9.79 (9.00)
EAT-26	34.30 (18.19)	35.36 (16.40)	7.65 (5.78)	5.00 (4.29)

EAT-26 scores ( $F'(3, 32) = 29.42, p < .001$ ) showed that the restrictive anorexic and bulimic type subjects' scores were significantly greater than the psychiatric and nonpsychiatric control subjects' scores.

To put some of the means in Table 4 in perspective, some comparative data will be presented. Garner et al. (1982) reported data on the EAT-26 for undergraduate-aged women. The means (and standard deviations) they presented are as follows: restrictive anorexic 33.7 (18.7); bulimic anorexic 38.4 (15.0); and control 9.9 (9.2). The percentages of average body weight for age and height presented in Table 4 are based on adolescent norms as derived from Forbes (1972). Much of the eating disorder research employs adult women as subjects and, therefore, percentages of average body weight for height are often reported which are based on the Metropolitan Life Insurance Company (1983) standard tables. Corresponding current percentages of average body weight for height for the adolescent female subjects in the present study would be as follows: restrictive anorexic 76.3%; bulimic type 94.5%; psychiatric control 95.5%; and nonpsychiatric control 94.4%. In terms of the BMI, the average range of values (associated with Metropolitan Life Insurance Company standards) for women of comparable height to the adolescent subjects in the present study is 21 to 24 (Metropolitan Life Insurance Company, 1984).

Finally, some data of relevance only to the eating disorder groups will be described. The current mean number of binge-eating episodes per month for the bulimic type group was

10.71; however, 3 of the 14 subjects were not currently binge-eating. For the 11 (79%) subjects who were currently binge-eating, the mean was 13.64 episodes per month. Of the bulimic type subjects, 86% reported having self-induced vomiting (79%) or having used laxatives (43%). Of the restrictive anorexic subjects, 45% reported a history of self-induced vomiting (35%) or laxative use (20%). At the time of the study, 36% of the bulimic type subjects reported self-induced vomiting (29%) or laxative use (29%). Of the restrictive anorexic subjects, 35% reported currently engaging in self-induced vomiting (20%) or laxative use (15%).

Psychiatric distress-related measures. Means for the three psychiatric distress-related measures are presented in Table 5. The effect for number of impulse-related behaviors (IMPULSES) was nonsignificant. The corrected-for-heterogeneity ANOVA for the BSI-GSI was significant ( $F'(3, 34) = 7.81, p < .001$ ). Multiple comparisons showed that the bulimic type subjects reported significantly greater levels of general psychiatric distress than the nonpsychiatric control subjects did. The corrected-for-heterogeneity effect for BSI-Depress was also significant ( $F'(3, 31) = 6.86, p < .005$ ), with bulimic type subjects reporting significantly more depression than nonpsychiatric control subjects.

Comparing the results of the present study on the Brief Symptom Inventory (BSI) with the published norms for female adolescents on the BSI (Derogatis & Spencer, 1982) renders the



present study's means more interpretable. In terms of T-scores (mean of 50, standard deviation of 10), the means for

Table 5

Daughters' Psychiatric Distress-Related Means (Standard Deviations)

	Restrict. Anorexic	Bulimic Type	Psych. Control	Nonpsych. Control
BSI- GSI	1.16 (0.88)	1.53 (0.71)	1.15 (0.84)	0.62 (0.43)
BSI- DEPRESS	1.33 (1.32)	2.06 (1.17)	1.25 (0.93)	0.63 (0.67)
IMPULSES	1.85 (1.69)	2.86 (2.25)	2.15 (1.73)	1.71 (1.55)

the BSI-GSI translate as follows: restrictive anorexic T = 58; bulimic type T = 62; psychiatric control T = 58; and nonpsychiatric control T = 49. The means for the BSI Depression scale translate as: restrictive anorexic T = 58; bulimic type T = 64; psychiatric control T = 57; and nonpsychiatric control T = 50. Thus, while nonpsychiatric control subjects' depression and distress levels are normatively average, clinical subjects' depression and distress levels are approximately one standard deviation above the norm.

### Tests of Study Hypotheses

To initiate the tests of the study's hypotheses, a 4 X 2 MANOVA was conducted on the 20 dependent measures of relevance. Due to the problem of singularity of variance-covariance matrices, Box's M test had to be conducted on two sets of 13 dependent measures. These tests yielded nonsignificance for mothers and daughters, suggesting that homogeneity of variance-covariance matrices could be assumed.

The general questions addressed by this MANOVA were: 1) Are there differences in the family characteristics reported amongst the four groups? and 2) Do the differences reported amongst the four groups vary as a function of whether the source of the report is mothers or daughters? The first question was addressed by testing the main effect of Group, while the second question was addressed by testing the interaction effect of Group by Relation. A third question addressed by the MANOVA, but of less interest in the present study, was: Do the reports of mothers and daughters differ overall? (i.e., the main effect of Relation). It would be of interest, however, if the relationship between mothers' and daughters' reports differed as a function of group membership (i.e., the interaction effect).

The results of the 4 X 2 MANOVA were significant for Group ( $F(60, 164.92) = 1.81, p < .003$ ), Group by Relation ( $F(60, 164.92) = 1.74, p < .004$ ), and Relation ( $F(20, 55) = 6.54, p < .001$ ). Thus, univariate tests were conducted with a modified alpha of .005 (i.e., .10 divided by 20).

Family system/interaction hypothesis. Six of the 20 dependent measures in the overall MANOVA above were relevant to the family system/interaction hypothesis: FES-Cohesion, FES-Expressiveness, FES-Conflict, FES-Independence, FES-Organization, and FES-Control. The specific hypothesis was that the families of bulimic type and psychiatric control subjects would be characterized as more dysfunctional than the families of nonpsychiatric control subjects, whereas the families of restrictive anorexic subjects would be characterized as more similar to the families of nonpsychiatric control subjects. "Dysfunctional" is operationalized as less cohesive, expressive, independent, and organized, and as more conflictual and controlling.

The means for the six dependent variables for daughters and mothers are presented in Table 6. The ANOVA for Cohesion was significant for Group ( $F(3, 74) = 6.18, p < .002$ ) and for Relation ( $F(1, 74) = 16.39, p < .001$ ), but not for the Group by Relation interaction. Multiple comparisons indicated that restrictive anorexic and nonpsychiatric control mothers and daughters characterized their families as more cohesive than bulimic type and psychiatric control mothers and daughters did. Overall, mothers characterized their family environments as more cohesive than daughters did.

The ANOVAs for Expressiveness and Independence were not significant for Group or for the Group by Relation interaction. The main effect of Relation was significant for Expressiveness ( $F(1, 74) = 56.24, p < .001$ ) and for Independence

( $F(1, 74) = 8.62, p < .005$ ). Mothers characterized their families as more expressive and encouraging of independence than did daughters.

None of the effects for Conflict, Organization, or Control reached significance.

Table 6

Family System/Interaction Means (Standard Deviations)

VARIABLE	RELATION	Rest. Anor.	Bul. Type	Psych. Cont.	Non. Cont.
Cohesion	Daughter	6.35 (2.58)	4.43 (2.88)	4.15 (2.58)	6.29 (2.69)
	Mother	7.20 (1.82)	5.64 (1.99)	6.10 (2.40)	7.67 (1.55)
Express.	Daughter	4.10 (2.40)	3.29 (1.54)	3.35 (1.98)	4.63 (2.00)
	Mother	5.75 (2.05)	5.29 (1.59)	5.25 (1.71)	6.79 (1.84)
Conflict	Daughter	4.05 (2.21)	4.64 (1.99)	5.20 (2.14)	3.83 (2.48)
	Mother	4.00 (2.08)	4.36 (1.78)	4.35 (2.25)	3.04 (2.12)
Independ.	Daughter	5.65 (2.16)	5.07 (2.20)	5.75 (1.45)	6.88 (1.23)
	Mother	6.25 (1.45)	7.07 (1.33)	6.15 (1.42)	6.83 (1.09)
Organiz.	Daughter	5.55 (2.52)	5.21 (2.55)	4.65 (2.25)	5.71 (2.14)
	Mother	5.90 (2.05)	5.36 (2.68)	5.20 (2.46)	5.67 (2.48)
Control	Daughter	4.85 (2.48)	4.86 (2.25)	5.80 (2.84)	4.71 (2.14)
	Mother	5.05 (2.06)	4.57 (2.34)	5.00 (2.03)	4.50 (2.09)

The results of mothers' responses to the Dyadic Adjustment Scale (DAS) were also relevant to the family system/interaction hypothesis. A one-way ANOVA, with modified alpha of .005 so as to be congruent with the foregoing analyses, was therefore conducted. It should be noted that the number of subjects available for this analysis was decreased by the number of single mothers in each group. The following Ns resulted: restrictive anorexic n=16; bulimic type n=12; psychiatric control n=11; and nonpsychiatric control n=20. The ANOVA was nonsignificant. The means are presented in Table 7.

Table 7

Dyadic Adjustment Scale Means (Standard Deviations)

Restrictive Anorexic (n=16)	Bulimic Type (n=12)	Psychiatric Control (n=11)	Nonpsychiatric Control (n=20)
107.81 (14.72)	109.83 (18.34)	105.73 (30.53)	112.05 (19.28)

Family sociocultural milieu hypotheses. Fourteen of the 20 dependent measures included in the overall MANOVA were of relevance to the family sociocultural milieu hypotheses. Four were relevant to the achievement orientation hypothesis: WOFO-Work, WOFO-Mastery, WOFO-Competitiveness, and FES-Achievement Orientation. One was relevant to the sex role ideology hypothesis: the Sex Role Ideology Scale. And six

were relevant to the weight and appearance attitudes hypothesis: FFL-Weight, FFL-Appearance, FFL-Fitness, BES-Attractiveness, BES-Weight, and BES-Condition. Three other measures were included for comparability with extant literature: FES-Active-Recreational Orientation, FES-Intellectual-Cultural Orientation, and FES-Moral-Religious Emphasis. The specific hypotheses were that the restrictive anorexic and bulimic type mothers and daughters would be characterized as higher in achievement orientation (individual and family), traditional sex role ideology, and weight and appearance orientation than the psychiatric control mothers and daughters. No specific hypothesis was made regarding the nonpsychiatric control subjects; however, their inclusion in the design was important for providing normative data.

The means regarding the achievement orientation hypothesis are presented in Table 8. The main effects of Group for WOFO-Work, for WOFO-Mastery, for WOFO-Competitiveness, and for FES-Achievement Orientation were all nonsignificant. Similarly, none of the interactions were significant. For the main effect of Relation, the ANOVAs for Work and Mastery were nonsignificant, whereas the ANOVAs for Competitiveness ( $F(1, 74) = 15.45, p < .001$ ) and Achievement Orientation ( $F(1, 74) = 9.51, p < .004$ ) were significant. Mothers rated themselves as less competitive than daughters rated themselves, and mothers characterized their families as less achievement oriented than did daughters.

Table 8

Achievement Orientation Means (Standard Deviations)

VARIABLE	RELATION	Rest. Anor.	Bul. Type	Psych. Cont.	Non. Cont.
WOFO- Work	Daughter	20.70 (3.39)	18.50 (4.18)	19.10 (4.35)	19.54 (3.13)
	Mother	20.80 (2.88)	20.50 (2.79)	20.95 (3.90)	21.13 (2.91)
WOFO- Mastery	Daughter	18.35 (3.12)	15.43 (4.99)	18.65 (4.98)	19.88 (3.90)
	Mother	16.85 (5.49)	18.29 (4.60)	19.15 (3.47)	19.96 (5.27)
WOFO- Compet.	Daughter	12.70 (4.77)	12.07 (4.20)	9.85 (5.59)	11.63 (3.99)
	Mother	9.80 (4.23)	10.00 (4.74)	8.60 (4.58)	8.54 (5.14)
FES- Achieve. Orient.	Daughter	6.20 (1.70)	6.00 (1.80)	5.85 (1.79)	5.63 (1.53)
	Mother	5.65 (1.73)	4.71 (1.49)	5.10 (1.33)	5.50 (1.96)

To provide some context to the tests of the achievement orientation hypothesis, a one-way ANOVA on daughters' average grades in school was conducted (with modified alpha of .005 for congruence with the preceding analyses). Means are presented in Table 9. This ANOVA was significant ( $F(3, 74) = 5.97, p < .002$ ), with multiple comparisons showing that the school grades of restrictive anorexic and nonpsychiatric control daughters were significantly higher than those of psychiatric control daughters.

Table 9

Daughters' School Grades Means (Standard Deviations)

Restrictive Anorexic	Bulimic Type	Psychiatric Control	Nonpsychiatric Control
8.40 (1.43)	7.57 (1.22)	7.05 (1.10)	8.42 (1.18)

Note. Grades scored on the following scale: 1 = 0 - 10%; 2 = 11 - 20%; 3 = 21 - 30%; 4 = 31 - 40%; 5 = 41 - 50%; 6 = 51 - 60%; 7 = 61 - 70%; 8 = 71 - 80%; 9 = 81 - 90%; and 10 = 91 - 100%.

The means for the Sex Role Ideology Scale are presented in Table 10. The results of the ANOVA showed that the effects of Group, Relation, and the Group by Relation interaction were all nonsignificant.

Table 10

Sex Role Ideology Scale Means (Standard Deviations)

RELATION	Restrict. Anorexic	Bulimic Type	Psych. Control	Nonpsych. Control
Daughter	147.75 (21.02)	151.14 (26.22)	151.40 (21.28)	152.25 (24.44)
Mother	139.35 (26.00)	152.79 (21.88)	146.40 (25.94)	157.42 (26.32)

Means regarding the weight and appearance attitudes hypothesis are presented in Table 11. The Group by Relation



interaction effects were significant for FFL-Weight ( $F(3, 74) = 12.14, p < .001$ ) and BES-Weight ( $F(3, 74) = 8.84, p < .001$ ), but not for FFL-Appearance, FFL-Fitness, BES-Attractiveness, or BES-Condition. Following the significant interactions, the main effects were not examined; rather, tests on simple main effects were conducted with appropriate adjustments for repeated measures to the within-cell mean square and degrees of freedom as delineated by Winer (1971; pp. 529-532).

The simple main effects tests of Group for FFL-Weight revealed that the group effect for Mother was nonsignificant, whereas that for Daughter was significant ( $F(3, 146) = 13.11, p < .001$ ). Subsequent multiple comparisons showed that restrictive anorexic and bulimic type daughters ascribed significantly greater importance to weight than did psychiatric and nonpsychiatric control daughters. The simple main effects tests of Group for BES-Weight similarly indicated that the Group effect for Mother was nonsignificant, whereas that for Daughter was significant ( $F(3, 143) = 11.17, p < .001$ ). The multiple comparisons showed that restrictive anorexic and bulimic type daughters had significantly more negative attitudes toward their own weight than did psychiatric and nonpsychiatric control daughters.

The main effect of Group was nonsignificant for FFL-Appearance, FFL-Fitness, and BES-Attractiveness, but was significant for BES-Condition ( $F(3, 74) = 7.75, p < .001$ ).

Table 11

Weight and Appearance Attitudes Means (Standard Deviations)

VARIABLE	RELATION	Rest. Anor.	Bul. Type	Psych. Cont.	Non. Cont.
FFL- Weight	Daughter	35.65 (7.57)	35.29 (5.37)	25.00 (7.48)	26.38 (6.18)
	Mother	24.45 (6.70)	28.00 (7.37)	27.60 (7.03)	29.00 (6.72)
FFL- Appear.	Daughter	47.60 (8.78)	45.71 (11.34)	43.50 (8.86)	48.13 (10.50)
	Mother	44.45 (6.89)	41.64 (9.48)	42.70 (8.57)	43.71 (8.25)
FFL- Fitness	Daughter	26.85 (6.24)	25.00 (6.74)	24.50 (6.25)	25.83 (4.91)
	Mother	23.45 (4.10)	23.36 (5.65)	21.75 (5.36)	26.17 (5.44)
BES- Attract.	Daughter	39.10 (5.93)	38.64 (5.97)	43.05 (7.64)	46.08 (5.56)
	Mother	45.70 (6.28)	45.21 (5.75)	44.85 (5.26)	46.29 (6.48)
BES- Weight	Daughter	19.00 (9.21)	16.43 (6.95)	26.95 (10.68)	29.96 (7.54)
	Mother	29.10 (5.88)	30.50 (7.14)	26.75 (8.98)	29.29 (8.66)
BES- Condition	Daughter	27.25 (6.45)	27.00 (5.51)	29.30 (7.41)	35.63 (4.72)
	Mother	29.60 (5.93)	32.86 (4.11)	30.80 (6.54)	33.42 (6.74)

Multiple comparisons showed that nonpsychiatric control subjects reported significantly more positive attitudes toward their own physical condition than did subjects in the other three groups. The main effect of Relation was nonsignificant for FFL-Appearance, FFL-Fitness, and BES-Condition, but was significant for BES-Attractiveness ( $F(1, 74) = 18.11, p < .001$ ). Mothers reported significantly more positive attitudes toward their own physical attractiveness than did daughters.

To put the results of the weight and appearance attitudes hypothesis for mothers in context, a one-way MANOVA on the following five variables was conducted: height, current weight, percentage of average body weight for height (%ABW), body mass index (BMI), and ideal or desired weight. Means for these variables are presented in Table 12. This MANOVA was not significant and, therefore, univariate tests were not conducted.

Finally, the means for the three additional sociocultural milieu measures are presented in Table 13. The ANOVA showed nonsignificant interaction effects for FES-Active-Recreational Orientation, FES-Intellectual-Cultural Orientation, and FES-Moral-Religious Emphasis. Although the effects of Group for FES-Active-Recreational Orientation and FES-Moral-Religious Emphasis were nonsignificant, the effect of Group for FES-Intellectual-Cultural Orientation ( $F(3, 74) = 6.97, p < .001$ )

Table 12

Mothers' Weight-Related Means (Standard Deviations)

	Restrict. Anorexic	Bulimic Type	Psych. Control	Nonpsych. Control
Height- inches	64.45 (2.04)	64.43 (2.31)	64.60 (2.37)	64.13 (2.15)
Weight- pounds	139.80 (23.66)	141.36 (24.88)	152.85 (25.44)	139.46 (21.85)
%ABW	105.70 (17.19)	106.43 (15.68)	114.75 (18.17)	105.96 (14.75)
BMI	23.70 (4.03)	23.79 (3.45)	25.70 (4.39)	23.83 (3.36)
Ideal Weight	126.15 (11.14)	133.07 (23.10)	132.80 (11.05)	126.33 (12.69)

was significant. Multiple comparisons showed that nonpsychiatric control mothers and daughters characterized their families as significantly more interested in intellectual and cultural activities than did mothers and daughters in the other three groups. Regarding the main effect of Relation, the ANOVA for FES-Intellectual-Cultural Orientation was significant ( $F(1, 74) = 19.52, p < .001$ ), whereas those for FES-Active-Recreational Orientation and FES-Moral-Religious Emphasis were not. Mothers characterized their family environments as significantly more interested in intellectual and cultural activities than did daughters.

Table 13

Additional Sociocultural Milieu Measures Means (Standard Deviations)

VARIABLE	RELATION	Rest. Anor.	Bul. Type	Psych. Cont.	Non. Cont.
FES- Active- Recreat. Orient.	Daughter	6.20 (2.55)	5.21 (2.26)	5.30 (2.23)	6.71 (1.83)
	Mother	6.00 (2.43)	5.07 (2.24)	4.70 (2.52)	6.50 (1.79)
FES- Intell.- Cultural Orient.	Daughter	5.00 (2.34)	4.50 (1.61)	4.50 (2.40)	6.46 (2.06)
	Mother	5.80 (2.14)	5.86 (1.56)	5.10 (2.27)	7.71 (1.63)
FES- Moral- Relig. Emphasis	Daughter	4.05 (2.63)	3.86 (2.80)	3.95 (2.72)	3.92 (3.01)
	Mother	4.55 (1.96)	4.64 (2.87)	4.55 (2.65)	4.08 (2.86)

Additional Analyses

Analyses of covariance. As will be recalled from the Method section, there were a number of significant differences amongst the groups in terms of demographic and treatment-related data. In particular, there were significant group differences regarding daughter's age, daughter's duration of disorder, daughter's history of hospitalization, average parental education, and total parental income. In the tests of the study's hypotheses, significant Group effects were found for five dependent variables: FES-Cohesion, FES-Intellectual-Cultural Orientation, BES-Condition, BES-Weight

(daughters only), and FFL-Weight (daughters only). To address the possibility that some of the demographic or treatment-related effects might be confounded with the Group effects and might, therefore, be biasing the results, an analysis of covariance (ANCOVA) was conducted for any significant dependent variable which was also significantly ( $\alpha = .05$ ) correlated with a potentially biasing demographic or treatment-related variable. An exception was made in that correlations with history of hospitalization were not examined as differences on this variable seemed inherent to the groups and, therefore, not appropriate for analysis of covariance. The correlation coefficients between the other variables, for daughters and mothers, are presented in Tables 14 and 15 respectively.

Examining the correlations suggests that age should be covaried from BES-Weight, education should be covaried from FES-Intellectual-Cultural Orientation and BES-Condition, and income should be covaried from FES-Intellectual-Cultural Orientation and FFL-Weight. Thus, five ANCOVAs were conducted. The homogeneity of regression coefficients assumption was not tested as ANCOVA is reported to be robust to violations of this assumption (Glass et al., 1972; Winer, 1971), and Type I errors are unlikely to result from heterogeneous slopes alone (Glass et al., 1972).

For BES-Weight and FFL-Weight, the Group by Relation interaction effects were significant and tests of simple main

effects revealed significant Group differences for daughters only. Therefore, one-way ANCOVAs were conducted in this case

Table 14

Correlations Between Dependent Variables and Potential Confounds - Daughters

DEPENDENT VARIABLE	<u>POTENTIAL CONFOUND</u>			
	Age Daughter	Duration Disorder	Parental Education	Parental Income
FES- Cohesion	-.009 p=.469	-.124 p=.187	.023 p=.420	-.080 p=.244
FES- Intellect.	-.111 p=.166	.174 p=.104	.342 p=.001	.088 p=.222
BES- Condition	-.179 p=.059	-.084 p=.274	.309 p=.003	.057 p=.310
BES- Weight	-.170 p=.068	.138 p=.161	.162 p=.078	-.095 p=.205
FFL- Weight	.116 p=.155	-.113 p=.209	-.124 p=.140	.305 p=.003

Note. Figures based on n=78 for Age, Education, and Income. Figures based on n=54 for Duration.

Table 15

Correlations Between Dependent Variables and Potential Confounds - Mothers

DEPENDENT VARIABLE	<u>POTENTIAL CONFOUND</u>			
	Age Mother	Duration Disorder	Parental Education	Parental Income
FES- Cohesion	-.090 p=.216	-.081 p=.280	.176 p=.062	.036 p=.377
FES- Intellect.	.137 p=.116	-.111 p=.213	.579 p=.000	.247 p=.014
BES- Condition	.149 p=.096	-.205 p=.068	.155 p=.088	.103 p=.184
BES- Weight	.262 p=.010	-.162 p=.121	.073 p=.264	.128 p=.131
FFL- Weight	.066 p=.282	.030 p=.414	.076 p=.253	.158 p=.084

Note. Figures based on n=78 for Age, Education, and Income. Figures based on n=54 for Duration.

and compared with results of one-way ANOVAs. The one-way ANCOVA for BES-Weight with age as a covariate was significant ( $F(3, 73) = 9.06, p < .001$ ) at the same level as the one-way ANOVA ( $F(3, 74) = 10.05, p < .001$ ). Similarly, employing income as a covariate in a one-way ANCOVA for FFL-Weight yielded significance ( $F(3, 73) = 11.90, p < .001$ ) of a comparable level to that in the one-way ANOVA ( $F(3, 74) = 13.37, p < .001$ ). Thus, the age or income differences did not appear to be accounting for the results.



Similarly, covarying education from BES-Condition in the analysis of variance yielded a still-significant F-ratio. This ANCOVA ( $F(3, 73) = 5.39, p < .003$ ) was significant at a slightly lower level than the ANOVA ( $F(3, 74) = 7.75, p < .001$ ), but was still significant vis-a-vis the modified alpha.

Comparing the results of ANCOVA and ANOVA in the case of FES-Intellectual-Cultural Orientation did reveal a situation of confounding bias. The original ANOVA Group effect was significant ( $F(3, 74) = 6.97, p < .001$ ), whereas the ANCOVA using education as a covariate was not significant given the modified alpha ( $F(3, 73) = 3.64, p = .017$ ). Covarying income only slightly decreased the significance of the Group effect ( $F(3, 73) = 6.27, p < .002$ ).

Subsidiary analyses: Family system/interaction hypothesis. It was of interest to explore other possible sources of variation in the data in order to aid in the interpretation of the results of the tests of the family system/interaction hypothesis. In particular, the possible effects of high versus low depression, psychiatric distress, impulsivity, and eating disorder symptomatology were of interest. Ideally, it would have been possible to enter these variables as third factors in the design; however, because of the small number of subjects and the dissimilar ranges of scores amongst the groups, this would have resulted in great disproportionality of cell size, low power, and questionable meaningfulness of results. Therefore, preliminary analyses were conducted in the form of four 2(High/Low) (Depression,

Distress, Impulsivity, or Eating Disorder Symptomatology) X 2(Relation) between-within groups MANOVAs with appropriate follow-up tests congruent with the other analyses of the study. The results of these analyses are presented in detail in the Appendix.

In summary form, the results of the analyses were as follows. The MANOVAs were significant for Depression, Distress, and Impulsivity, but not for Eating Disorder Symptomatology. Subsequent ANOVAs and tests of simple main effects revealed several significant effects for daughters, but not for mothers. Specifically, daughters in the High Depression and High Impulsivity groups characterized their families as significantly less cohesive and more conflictual than did daughters in the Low Depression and Low Impulsivity groups, respectively. Further, daughters in the High Depression and High Distress groups described their families as significantly less encouraging of independence than did daughters in the Low Depression and Low Distress groups, respectively.

#### Summary

The results can be summarized as follows. In terms of group composition, the restrictive anorexic daughters' current and minimum weights, percentages of average body weight, and body mass index scores were, as expected, lower than those of the daughters in the other three groups. The desired weights of the restrictive anorexic daughters were lower than those of the psychiatric and nonpsychiatric control daughters. On the

Eating Attitudes Test (EAT-26), a measure of eating disorder symptomatology, the restrictive anorexic and bulimic type daughters' scores were higher than the psychiatric and nonpsychiatric control daughters' scores. There were no group differences on height, maximum weight, or dissatisfaction with current weight. The psychiatric distress-related measures showed that bulimic type daughters reported greater levels of depression and general psychiatric distress than did nonpsychiatric control daughters. There were no differences between the groups in terms of number of impulse-related behaviors reported.

Regarding the family system/interaction hypothesis of the study, restrictive anorexic and nonpsychiatric control mothers and daughters characterized their families as more cohesive than did bulimic type and psychiatric control mothers and daughters. There were no differences amongst the four groups on expressiveness, conflict, independence, organization, or control; nor were there any differences amongst mothers on reports of marital adjustment. Overall, mothers characterized their families as more cohesive, expressive, and encouraging of independence than did their daughters.

In the subsidiary analyses, other sources of variation were found in the family system/interaction data for daughters, but not for mothers. Daughters in the High Depression group characterized their families as less cohesive, more conflictual, and less encouraging of independence than daughters in the Low Depression group did.

Daughters in the High Impulsivity group characterized their families as less cohesive and more conflictual than daughters in the Low Impulsivity group did. And, finally, the daughters of the High Distress group described their families as less encouraging of independence than daughters in the Low Distress group did. There were no group differences for mothers or daughters in terms of expressiveness, organization, or control. Also, there were no differences between High and Low Eating Disorder Symptomatology groups for mothers or daughters.

With respect to the achievement orientation hypothesis, there were no group differences on work, mastery, competitiveness, or family achievement orientation, but restrictive anorexic and nonpsychiatric control daughters did have higher average school grades than psychiatric control daughters had. Overall, mothers characterized their families as less achievement oriented and described themselves as less competitive than daughters did.

There were no differences in sex role ideology amongst the groups.

Regarding the weight and appearance attitudes hypothesis, restrictive anorexic and bulimic type daughters, but not mothers, ascribed greater importance to weight and had a more negative attitude toward their own weight than psychiatric and nonpsychiatric control daughters did. Nonpsychiatric control mothers and daughters had more positive attitudes toward their own physical condition than mothers and daughters in the other

three groups did. There were no group differences in terms of attitude toward one's own attractiveness, or importance ascribed to appearance or fitness. Overall, mothers had a more positive attitude toward their own attractiveness than daughters did. There were no differences amongst mothers in terms of weight-related variables.

Finally, with regard to the additional sociocultural milieu measures, nonpsychiatric control mothers and daughters characterized their families as more interested in intellectual and cultural activities than mothers and daughters in the other three groups did. However, differences amongst the groups in average parental education could account for this finding. There were no group differences in terms of family participation in social and recreational activities or in degree of family emphasis on religious issues and values. Overall, mothers characterized their families as more interested in intellectual and cultural activities than daughters did.

## Discussion

In general, there was some support for the family system/interaction hypothesis. There was, however, little support for the family sociocultural milieu hypotheses. These results will be discussed and interpretations regarding the findings will be advanced. Limitations of the present study will be delineated, and methods to overcome these difficulties will be suggested. Finally, questions for future research arising from the results, and possible ways of testing these, will be discussed.

### Family System/Interaction Hypothesis

Main analyses. The family system/interaction hypothesis--that the families of bulimic type and psychiatric control subjects will be characterized as more dysfunctional than the families of nonpsychiatric control subjects, whereas the families of restrictive anorexic subjects will be characterized as more similar to the families of nonpsychiatric control subjects--received some support. In particular, the results for perceived family cohesion proved to be robust, with both mothers and daughters of the bulimic type and psychiatric control groups characterizing their family environments as less cohesive than mothers and daughters in the restrictive anorexic and nonpsychiatric control groups. That is to say, the bulimic type and psychiatric control subjects reported that family members provided less commitment, help, and support for one another in

their families than did restrictive anorexic and nonpsychiatric control subjects.

Support for the family system/interaction hypothesis was not obtained on the measures of expressiveness, conflict, independence, organization, control, or marital adjustment. It should be noted, however, that the nonsignificance of results on the Expressiveness and Independence subscales was due to the modified alpha level employed in the present study. Thus, judgement should be suspended regarding the existence of effects on these variables until further, more powerful, studies are conducted. Similarly, the effect for the Conflict subscale approached significance and, therefore, future research should not be curtailed on the basis of the present study's negative result. It is also of note that, overall, mothers characterized their families as more cohesive, expressive, and encouraging of independence than daughters did. It is a common and well-known finding that parents rate their families more favorably than children do (e.g., Moos & Moos, 1986); therefore, this result will not be explored further here.

The results on the Organization and Control subscales and on the Dyadic Adjustment Scale did not support the hypothesis. According to the literature, one would expect the families of bulimic type subjects to be characterized as disorganized (e.g., Garner et al., 1984; Kog & Vandereycken, 1989; Root et al., 1986)., and the families of eating-disordered subjects to be characterized as controlling (e.g., Bruch, 1973; Minuchin

et al., 1978; Selvini-Palazzoli, 1978). Similarly, one would expect the marital relationship to be characterized as conflictual in the parents of bulimic type subjects (e.g., Schwartz et al., 1984; Strober & Yager, 1984). Other studies employing the FES, however, have also not found group differences on the Organization and Control subscales (Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Shisslak et al., 1990; Stern et al., 1987; Strauss & Ryan, 1987). It may be that these subscales do not tap the constructs of interest. For instance, the items on the Organization subscale revolve around the importance of organization and structure in planning family activities and responsibilities. Perhaps these items do not capture the important emotional disengagement component of the "chaotic" construct. Similarly, the items on the Control subscale reflect the extent to which set rules and procedures are used to run family life. This may not adequately measure the intended theoretical constructs which revolve around the child's needs not being responded to and, therefore, her independent control over her life being discouraged. In short, the FES subscales may assess organization and structure in a family in a concrete sense, whereas the importance of these constructs may lie in their more subtle, dynamic aspects. The Family Assessment Device and the Parental Bonding Instrument, as well as other subscales of the FES, appear to have been more successful in tapping these theoretical constructs (e.g., Fichter & Noegel, 1990; McNamara & Loveman, 1990).



The lack of results on the Dyadic Adjustment Scale is incongruent with the finding of Strober (1981) that the parents of bulimic anorexics rated their marital relationship more negatively than the parents of restrictive anorexics. Similarly, bulimic subjects have described their parents' marriages as more conflictual than control subjects (Dolan et al., 1990). It may be that the present study did not provide an adequate test on this measure due to the inclusion of both married and remarried subjects, exclusion of separated and divorced subjects, and resulting lowered number of subjects for this analysis. It is also possible, however, that the reported satisfaction of the marital relationship is not a crucial aspect of the family system/interaction hypothesis.

With respect to the failure of the effects for FES subscales Expressiveness, Conflict, and Independence to reach significance, a number of potential explanations can be advanced. Significant differences on the Independence subscale of the FES have not been consistently found in research with adult women. It may be that, as with the Organization and Control subscales, this subscale does not tap the specific theoretical construct of interest. That is to say, whereas the subscale is intended to reflect the extent to which family members are assertive, self-sufficient, and make their own decisions, the lack of encouragement of independence described in the literature has more to do with the child's needs not being acknowledged or heeded. The effect on this subscale did, however, approach significance and, therefore,

the possibility that it does tap the construct of interest in an adolescent population should not be ruled out. Also, bulimic or bulimic anorexic women have scored significantly lower than control women on this subscale in some other studies (Johnson & Flach, 1985; Shisslak et al., 1990).

The lack of significant findings on the Expressiveness and Conflict subscales is definitely incongruent with the existing research literature. Bulimic and restrictive anorexic women have consistently been found to describe their family environments as less expressive than control women (Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Shisslak et al., 1990; Stern et al., 1987; Strauss & Ryan, 1987), and bulimic women have fairly consistently portrayed their families as more conflictual than control women (Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Shisslak et al., 1990). One reason for the discrepant findings of the present study on the Expressiveness subscale may be the modified alpha level which was employed in an attempt to provide some control over the Type I error rate. However, this would not explain the failure to replicate the Conflict effect and, upon examination, it appears that the absolute value of the differences attained with the adolescent subjects on the Expressiveness and Conflict subscales are smaller than those observed in the adult subject literature.

It may be that the nonsignificance of results in the present study on these two subscales is due to the young age of the subjects employed. For instance, Calam et al. (1990)

found, within a group of adult eating-disordered and non-eating-disordered subjects, that older subjects perceived their parents in a more negative light than younger subjects. They suggested that early adulthood may be a time when subjects re-assess their families and come to see their parents more critically. It could be that, in the present sample, clinical subjects are as yet unable to perceive or assess family dysfunction which may in fact exist. This might apply to the restrictive anorexic group in particular as denial and minimization are thought to be associated features of this disorder (e.g., American Psychiatric Association, 1987). Alternatively, it may be that it is only with increasing time and chronicity that the families of clinical subjects become dysfunctional. Smaller effect sizes could also have been due to the adolescent nonpsychiatric control subjects perceiving their family environments more negatively than an adult control group might, due to the struggle for separation and autonomy occurring in adolescence. Thus, more negative perceptions of the adolescent nonpsychiatric control group, or less negative perceptions of one or more of the adolescent clinical groups, may have resulted in less robust findings on the Expressiveness and Conflict subscales than are found in the adult literature.

Finally, returning to the Cohesion subscale, the results of the present study were robust and consistent with the theoretical and empirical literature regarding anorexia nervosa and bulimia nervosa. Congruent with Hilde Bruch

(e.g., 1973), the families of restrictive anorexics were characterized as equally cohesive and supportive as the families of nonpsychiatric controls. Similarly, Minuchin's theory (e.g., Minuchin et al., 1978) predicts closeness, loyalty, and concern in the families of anorexics. The cohesion measure may also reflect the perfect/chaotic family distinction formulated by Root et al. (1986), with the restrictive anorexics of the present study characterizing their families as more united and nurturant, while the bulimic subjects characterize their families as more distant and emotionally disengaged. Perhaps the Cohesion subscale of the FES is the most robust of the subscales because it taps a core emotional aspect of the theoretical formulations in terms of emotional support versus disengagement.

In terms of the empirical research employing the FES, the results of the present study are congruent with the consistent findings of other researchers regarding the lower family cohesiveness of bulimic subjects as compared to nonpsychiatric controls (e.g., Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Shisslak et al., 1990; Stern et al., 1987). The present study also empirically supports the theoretical prediction of higher perceived cohesiveness in the families of restrictive anorexics than in the families of bulimics, which previously had been supported by the reports of parents of restrictive and bulimic anorexics (Strober, 1981), but not by the reports of restrictive anorexic and bulimic or bulimic anorexic women themselves (Stern et al., 1987; Strauss & Ryan, 1987).

Strauss and Ryan (1987) found that restrictive anorexic and bulimic anorexic women both perceived lower family cohesion than controls, and Stern et al. (1987) found that bulimic women, but not restrictive anorexic women, reported lower cohesiveness than control women. Similarly, research employing other measures than the FES with adult subjects has produced inconsistent results regarding restrictor/binger differences, with some researchers finding such differences (Garner et al., 1985; Humphrey, 1986b, 1989; Kog & Vandereycken, 1989; Piran et al., 1988), and others not (Calam et al., 1990; Palmer et al., 1988; Steiger et al. 1989; Steiger et al., 1991; Waller et al., 1990b; Wonderlich & Swift, 1990b). Wonderlich and Swift (1990b) suggest that older restrictive anorexic subjects may be less likely than younger anorexic subjects to perceive their families as cohesive and nurturing. Thus, the significant difference found between restrictive anorexic and bulimic type subjects in the present study may, in part, be a function of the young age of the subjects. Perhaps as restrictive anorexics get older, they become more similar to bulimics in terms of perceived family cohesion.

Thus, the present study has shown that, during the early stages of an eating disorder, restrictive anorexic daughters and their mothers characterize their families as similar in cohesion to normal controls, whereas bulimic type daughters and their mothers characterize their families as similar in cohesion to psychiatric controls. The interpretation of this

finding depends, in part, on whether the similar level of perceived cohesion observed in restrictive anorexic and nonpsychiatric control subjects reflects a situation of similar actual family cohesion or a situation of denial or minimization on the part of the restrictive anorexic group.

If there are no actual differences in family cohesion between restrictive anorexic and nonpsychiatric control groups, it might be argued that the family environment does not play a contributing role in anorexia nervosa. However, there are numerous factors which suggest that the high level of cohesion reported by the restrictive anorexic group may be a product of denial or reflect a desire to appear cohesive rather than a truly cohesive family environment. For instance, denial and minimization are reportedly common in anorexia nervosa patients (e.g., American Psychiatric Association, 1987). Similarly, Bruch (1973) characterized the family members of anorexics as denying the existence of problems and having tensions hidden beneath a facade of normality, and Gordon et al. (1989) described how the empathy and relatedness apparently observed in an anorexic's family are actually distortions or simulations of normal concern. Also, one could argue from what is known about the severe and often intractable nature of anorexia nervosa, from the multitude of associated characteristics such as ineffectiveness and self-hatred (e.g., Bruch, 1973; Garner & Bemis, 1984), and from the intent on self-starvation and increased control that a problem-free family environment would

be improbable. Finally, it was the impression of the current author that there was more incongruence between the self-reports of the restrictive anorexic daughters and their mothers and information obtained from other sources than there was in the nonpsychiatric control daughters and mothers.

The results of the present study are correlational and, therefore, no inference regarding causation can be made. It is of interest, however, to speculate on the possible direction and mechanism of the association between eating disorder subtype and perceived family cohesion. One interpretation is that the different symptomatology of the eating disorder subtypes may differentially affect family cohesion. For instance, the starvation, low weight, hospitalization, or threat of impending death of the restrictive anorexic may function so as to increase family concern and cohesion to nonpsychiatric levels. This interpretation would fit with Minuchin's (Minuchin et al., 1978) systemic formulation that the anorexic symptoms maintain and are maintained by the dysfunctional family structure by, for instance, serving to avoid family conflict or separation. On the other hand, having an anorexic daughter may have served to increase family tension, power struggles, and frustration (e.g., Bruch, 1978; Kay et al., 1967) and, thus, to have lowered perceived family cohesion to nonpsychiatric levels. Similarly, regarding the bulimic type and psychiatric control groups, having a daughter in psychiatric treatment may have decreased the cohesiveness of the family.

An alternative interpretation of the results of the present study is that the reported cohesion of family members contributes to the development of the eating disorder subtypes. For instance, the syndrome of anorexia nervosa may be more likely to develop in a "perfect" or cohesive family environment where self-control, self-discipline, and self-denial are modeled. Similarly, a family which denies the existence of problems may encourage the development of anorexia nervosa, a disorder in which the existence or gravity of the problem is denied. The onset during adolescence would make sense in that separation would be stressful in a highly cohesive family environment. This would especially be true if, as has been suggested by numerous authors, the family environment is also one in which the child's needs and feelings have not been acknowledged, encouraged, or responded to (e.g., Bruch, 1973; Selvini-Palazzoli, 1978) and, therefore, the child does not know what her needs or feelings are and does not feel in control or ready for autonomy. If the family appears cohesive and supportive, but actually does not respond to the true needs of the child and, therefore, neglects her, the child may feel confused and worry that something is somehow wrong with her or that love and acceptance may be withdrawn. The syndrome of anorexia nervosa then might function to help the adolescent to feel in control, approved of, and worthy, and to give her an identity via a symptom which Gordon et al. (1989) describe as sufficiently



similar to normal self-control that the patient and her family do not, at least initially, perceive it to be a problem.

The reported level of family cohesion in the present study was different in restrictive anorexics than in psychiatric controls, therefore suggesting that there may be a specific link between anorexia nervosa and high perceived cohesion. The possibility that high cohesion would facilitate the development of certain other disorders cannot be ruled out, however, as the present study employed a heterogeneous psychiatric control group. With respect to the bulimic type group, there were no significant differences in cohesion from the psychiatric control group; therefore, a specific family characteristic was not found. This is not to say, however, that the low family cohesion could not contribute to the development of bulimia nervosa in a nonspecific manner as part of a multivariate causal model (e.g., Garber & Hollon, 1991). For instance, the lower cohesion of the bulimic type subject's family may model a more uncontrolled coping style, and may result in feelings and needs being less easily denied. The symptom of binge-eating may, therefore, be more likely to develop.

Subsidiary analyses. To aid in the interpretation of the results and, in particular, to render them more comparable with the results of studies which had come out since the inception of the present study, some subsidiary analyses were conducted. As suggested by the more recent research, other sources of variation were found in the family

system/interaction data for daughters. In particular, cohesion, conflict, and independence were found to vary with the daughter's level of depression, impulsivity, and psychiatric distress such that the highly depressed, impulsive, or distressed daughters reported their family environments to be more dysfunctional than the less depressed, impulsive, or distressed daughters. Level of depression yielded the most robust results. It is of note that there were no differences in these analyses for mothers. Also, dividing daughters into high and low eating disorder symptomatology groups failed to produce significant differences in family interaction.

The recent research has shown that the family environments described by bulimic and mixed eating disorder subjects are associated with the subjects' level of depression (Blouin et al., 1990; Wonderlich & Swift, 1990b), personality disorder features (Johnson et al., 1989; Wonderlich & Swift, 1990a), and family childhood sexual abuse history (Bulik et al., 1989). The high percentage of eating disorder subjects who fall into these categories has also been pointed to as evidence of the substantial comorbidity and heterogeneity within eating disorder groups (e.g., Johnson et al., 1989). There are also strong associations amongst depression, borderline personality disorder, and sexual abuse history (e.g., Bulik et al., 1989; Johnson et al., 1989). In the present study, measures of depression, general psychiatric distress, and impulsivity were available, and were similarly

found to be related to the adolescent subjects' reported family environment patterns. In addition, heterogeneity and comorbidity were also apparent within the adolescent groups of the present study (see Table 16). Regarding comorbidity, it is also of note that 20% of the present study's psychiatric control group had to be excluded on the basis of high eating disorder symptomatology.

In the present study, there were no differences in family functioning between high and low eating disorder symptomatology groups. Taken together with the above findings, this could lead one to postulate that family functioning is not related to eating disorders per se at all, but rather is a function of eating-disordered subjects' comorbidity. However, in the main analyses of the family system/interaction hypothesis, differences in family function were found between the restrictive anorexic and bulimic type groups, suggesting that a qualitative rather than quantitative division is of importance. Still, it could be argued that this restricter/binger difference is only a function of the higher levels of depression and distress apparent in the bulimic type group (see Tables 5 and 16). The finding that there are significant differences in family functioning reported by mothers in the main analyses but not in the subsidiary analyses, however, suggests that there may also be an association between eating disorders and family system/interaction which is not dependent upon subjects' comorbidity.

That differences in reported family interaction are present in the subsidiary analyses for daughters but not for mothers suggests that the finding may be a result of state-dependent differences in perception. That is to say, depressed or distressed daughters may be more likely to perceive their family environments negatively, either through negative distortion/bias or through increased awareness and decreased censoring (i.e., lack of positive bias). Similarly, more impulsive or acting out daughters may be less likely to censor their responses in the service of social desirability, or may be more aware of family dysfunction. Such state-dependent effects could not, however, account for the differences in mothers' reports found in the main analyses, raising the possibility of a direct association between eating disorders and reported family functioning. Another finding which suggests there may be a direct association between eating disorders and family environment is that, despite similar percentages and levels of depression, impulsivity, and distress observed in the restrictive anorexic and psychiatric control groups (see Tables 5 and 16), mothers and daughters reported significantly different levels of family cohesiveness (see Table 6). Thus, there may be some specificity of association of family environment with eating disorders, at least for the restrictive anorexic subtype.

Thus far, the bulimic type group has not been discriminated from the psychiatric control group. However, it will be recalled that the bulimic type group reported

significantly greater depression and psychiatric distress than the nonpsychiatric control group, whereas the restrictive anorexic and psychiatric control groups did not significantly differ in depression or distress from either the nonpsychiatric control group or the bulimic type group (see Table 5). Also, examining Table 16, it is apparent that the bulimic type group is composed of approximately twice as many highly depressed and highly distressed subjects as the restrictive anorexic and psychiatric control groups are. Despite this greater level of distress and depression, there were no significant differences in family environment between the bulimic type and psychiatric control groups. On this basis, one might have expected lower reported family cohesion in the bulimic type group than in the psychiatric control group. Thus, with the aim of stimulating further research, the highly speculative possibility will be raised here that the family environments of bulimics may be similar to the family environments of restrictive anorexics in terms of the desire to appear cohesive and to deny the existence of problems, but that the bulimic family members are not able to maintain this myth as well as the restrictive anorexic family members due to their greater affective instability.

The literature on family factors in anorexia nervosa and bulimia nervosa suggests that there may be similarities in family environment. For instance, both anorexics' (e.g., Norris & Jones, 1979) and bulimics' (e.g., Humphrey & Stern, 1988) families have been characterized as presenting in an

idealized and problem-free manner. Similarly, enmeshment and overprotection are attributed to the families of anorexics (e.g., Minuchin et al., 1978) and bulimics (e.g., Root et al., 1986; Schwartz et al., 1984). Further suggestive of family similarities are: the observations of anorexic and bulimic members within the same family (e.g., Kaffman & Sadeh, 1989); the statistic that approximately 25% to 50% of restrictive anorexics eventually develop bulimic symptoms (e.g., Garner et al., 1984); and reports that the same individual may alternate between the disorders of anorexia nervosa and bulimia nervosa (e.g., Garner, 1986). In addition, the eating disorders of anorexia nervosa and bulimia nervosa are very similar, with the major difference being the presence or absence of binge-eating. Bulimic individuals are similarly resistant to ceasing dieting as restrictive anorexic individuals are (Garner, 1986). Finally, the associated psychopathology of anorexics and bulimics is similar. For instance, both have desires to be in control and deny interpersonal needs (e.g., Armstrong & Roth, 1989; Cooper, 1987; Sallas, 1985), show low self-esteem (e.g., Bruch, 1984; Mizes, 1985), have high needs for approval (e.g., Garner & Bemis, 1984; Weiss et al., 1985), and may struggle with issues of autonomy and identity, often being unable to articulate their inner worlds (e.g., Armstrong & Roth, 1989; Garner & Olmsted, 1984).

Thus, there have been many similarities noted between anorexic and bulimic individuals and their families. However, there are also differences consistently noted between these

individuals and families. In particular, bulimic individuals and their family members are reported to be more affectively unstable, depressed, and impulsive (e.g., Garner et al., 1984; Hsu et al., 1990; Strober et al., 1982), whereas anorexic individuals and their family members are described as more avoidant, overcontrolled, and introverted (e.g., Bruch, 1973; Piran et al., 1988; Shisslak et al., 1987; Strober et al., 1982, 1990). It has been suggested that such differences may be genetically transmitted (e.g., Hsu et al., 1990; Strober et al., 1990).

It is speculated, therefore, that a similar family environment of problem-denial and pseudo-cohesion may, depending on the context of family members' predominant genotypes, be associated with either anorexia nervosa or bulimia nervosa. In the context of familial affective instability, decreased ability to maintain the desired family cohesion may result, and the adolescent's eating disorder may come to serve--in addition to the functions of anorexia nervosa of increasing control, gaining approval, increasing self-worth, and securing an identity--the function of expressing, releasing, or numbing feelings through the act of binge-eating (cf. Garner, Garfinkel, & Bemis, 1982; Mizes, 1985). The bulimic, because of her greater affective instability, may be unable to maintain the rigid control of the anorexic. Similarly, because of the bulimic's, or one or more of her family members', emotional lability, the family may not be able to maintain the desired appearance of family

cohesiveness. It is postulated that, just as the bulimic may aspire to be anorexic (e.g., Crisp, 1981), the bulimic individual and her family members may aspire to have the apparent family environment of an individual with anorexia. The psychiatric control subjects, on the other hand, may not have such a strong desire to deny problems or to appear cohesive.

#### Family Sociocultural Milieu Hypotheses

The family sociocultural milieu hypotheses--that the restrictive anorexic and bulimic type mothers and daughters would be characterized as higher in achievement orientation, traditional sex role ideology, and weight and appearance orientation than the psychiatric control mothers and daughters --were not supported. These results will now be discussed.

Achievement orientation. Regarding the achievement orientation hypothesis, no group differences were found on the Work, Mastery, or Competitiveness subscales of the WOFO, or on the Achievement Orientation subscale of the FES. The restrictive anorexic and nonpsychiatric control daughters did, however, have higher average grades in school than the psychiatric control daughters.

The lack of differences amongst daughters on the WOFO is in contrast with the literature on the cognitive and personality characteristics of those with eating disorders. This literature suggests that anorexic and bulimic individuals are perfectionistic and achievement-oriented (e.g., Garner et al., 1982; Garner & Bemis, 1984; Heron & Leheup, 1984;



Thompson et al., 1987). It may be that the WOFO does not capture the essential aspects of the construct of interest. The WOFO was intended to reflect the desire to work hard, the preference for challenging tasks, and the enjoyment of interpersonal competition. Perhaps the anorexic or bulimic individual does not rate herself as high on these measures because, due to her negative self-evaluation and perfectionistically high standards (e.g., Garner & Bemis, 1984), she does not perceive herself to be achieving or successful, but rather to simply be doing what in her eyes is necessary to attain acceptance by self or others (e.g., Bruch, 1984; Garner et al., 1982). Even more extremely, due to dichotomous reasoning, she may believe that anything short of special or perfect performance renders her worthless (e.g., Bemis, 1985; Bruch, 1978). Thus, the anorexic or bulimic individual may not self-report desiring, preferring, or enjoying working hard, despite appearing to others to be driven to achieve. Garner and Bemis (1984) note that anorexic individuals often feel inadequate, and that they have not met people's expectations, despite often outstanding actual accomplishments. This is congruent with the results of the present study which showed that, in spite of having a serious eating disorder, restrictive anorexic daughters were achieving school grades comparable to nonpsychiatric control daughters' and higher than those of psychiatric control daughters.

The lack of significant differences on the FES Achievement Orientation subscale and on the mothers' WOFO

subscales is incongruent with the clinical literature which suggests that the families of eating-disordered individuals are highly achievement-oriented and have high expectations of their daughters (e.g., Bruch, 1973; Edwards, 1987; Humphrey & Stern, 1988). What little empirical research has been done in this area, however, has not generally supported the achievement orientation hypothesis (e.g., Dolan et al., 1990). The majority of studies employing the FES Achievement Orientation subscale have not found significant group differences (e.g., Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Shisslak et al., 1990; Strober, 1981). One potential explanation of this discrepancy between the clinical and empirical literature is that, as was argued for daughters above, the family members are not aware that their achievement strivings are excessive. Another potential explanation is that, because eating-disordered individuals have tended to come from the higher socioeconomic classes (e.g., Boskind-White & White, 1987; Hall, 1978), high achievement orientation may have been more apparent or more easily assumed than it would be now as eating disorders are beginning to occur in a broader range of socioeconomic classes (e.g., Dolan et al., 1990; Pope et al., 1987). In the present study, there were no significant differences in average parental education or total parental income amongst the three clinical groups. In general, eating-disordered subjects in the present study came from the middle to upper-middle class

but there was high variation with all socioeconomic classes being represented.

Sex role ideology. No significant differences in sex role ideology were found amongst the groups in the present study. This is incongruent with the clinical literature which describes the families of those with eating disorders as adhering to traditional sex role values (e.g., Gordon et al., 1989; Root et al., 1986; Selvini-Palazzoli, 1978; Wooley & Kearney-Cooke, 1986). However, the one empirical family study of sex role attitudes also found no significant differences (Dolan et al., 1990). Similarly, the empirical literature on the sex role attitudes of eating-disordered subjects themselves has yielded contradictory results (cf., Ordman & Kirschenbaum, 1986; Rost, Neuhaus, & Florin, 1982; Sriameswaran, Leichner, & Harper, 1984). Thus, it appears that the sex role ideology of the families of anorexic and bulimic individuals may not differ from that of control groups. This does not, however, preclude the possibility that the sex role socialization and stereotypes of the culture at large play a necessary role in predisposing women to be vulnerable to the development of eating disorders (e.g., Boskind-White & White, 1987; Striegel-Moore et al., 1986).

Weight and appearance attitudes. Restrictive anorexic and bulimic type daughters, but not mothers, were found to ascribe greater importance to weight and to have more negative attitudes toward their own weight than psychiatric and nonpsychiatric control daughters. This finding for daughters

was to be expected as such overvaluation and concerns about weight are part of the symptomatology of eating disorders. Thus, this result provides confirmatory evidence of the group selection criteria, but does not provide evidence in support of the family weight and appearance orientation hypothesis. That there were no significant differences amongst mothers in terms of importance attributed to weight, esteem regarding one's own weight, or current or ideal weight, fails to support the family weight and appearance orientation hypothesis. Similarly, there were no differences amongst mothers or daughters in terms of importance ascribed to fitness or appearance, or evaluation of one's own physical attractiveness. Nonpsychiatric control mothers and daughters had more positive attitudes toward their own physical condition than mothers and daughters in the other three groups; however, examining the means (see Table 11) suggests that this result was more a function of the lower esteem of the daughters in the clinical groups than of that of the mothers. (The interaction effect for this measure was significant at the .05 level but not at the modified alpha level employed in the present study.)

These findings fail to support the suggestions of theoretical and clinical authors that the parents of those with eating disorders are characterized by preoccupation with weight, dieting, and appearance (e.g., Bruch, 1973; Garner & Bemis, 1984; Minuchin et al., 1978; Root et al., 1986). Two empirical studies have addressed these issues and have found

conflicting results. Garfinkel et al. (1983) found no differences between the parents of eating-disordered adolescents and the parents of non-eating-disordered adolescents in terms of attitudes toward weight and dieting, or body size estimation or satisfaction. Pike and Rodin (1991), however, found that mothers of nonclinical eating-disordered adolescents had more eating-disordered behavior and evaluated their daughters' weight and appearance more negatively than mothers of non-eating-disordered adolescents. Similar to the results of the present study, no differences were found in mothers' current or ideal weights, nor in mothers' evaluation of their own weight and appearance. Further research is needed in this area; however, one potential explanation of the discrepant findings above is that Pike and Rodin's (1991) eating-disordered sample was not comprised of families in treatment for an adolescent's eating disorder. They were, in fact, unaware of the reason for their inclusion in the study. Perhaps knowing one's daughter has an eating disorder and is receiving treatment for it (which the family is usually involved in, in some way) serves to decrease the weight and appearance preoccupation which may have been present in the family, or at least to make parents less likely to report such preoccupation. Pike and Rodin's (1991) results also suggest that more specific measures, such as weight and appearance orientation being focused directly on the daughter, may be informative.

Another potential explanation for the lack of consistent results in this area is that weight and appearance preoccupation may be so prevalent in Western culture (e.g., Boskind-Lodahl & White, 1978; Garner et al., 1984; Polivy & Herman, 1987) that clinicians observe it in their patients' families, but group differences are not found in empirical studies. It is of note that in the present study no significant differences were found amongst mothers or daughters with respect to dissatisfaction with current weight (i.e., current weight minus ideal weight). Thus, mothers and daughters across groups desired to lose approximately 8 to 20 pounds, suggesting an almost universal dissatisfaction with current weight. As Garner's research group has pointed out (Garner, 1986; Garner et al., 1984), anorexia nervosa is a culturally syntonetic disorder.

Additional sociocultural milieu measures. Nonpsychiatric control mothers and daughters characterized their families as more interested in intellectual and cultural activities than mothers and daughters in the other three groups did; however, this difference appeared to be accounted for by the higher average parental education level of the nonpsychiatric control group. There were no group differences in terms of family participation in social and recreational activities or in degree of family emphasis on religious issues and values. The lack of significant group differences regarding active and recreational orientation is incongruent with the majority of the FES literature which finds lower scores on the Active-

Recreational Orientation subscale in the families of eating-disordered subjects than in normal controls (e.g., Johnson & Flach, 1985; Ordman & Kirschenbaum, 1986; Shisslak et al., 1990; Stern et al., 1987). It is of note, however, that the effect for the Active-Recreational Orientation subscale in the present study was significant according to conventional .05 levels, but not by the modified alpha level currently employed.

### General Conclusions

In the present study, restrictive anorexic and nonpsychiatric control female adolescents and their mothers characterized their family environments as more cohesive than bulimic type and psychiatric control mothers and daughters. Thus, reports by family members of high levels of family support and togetherness may distinguish the families of restrictive anorexic adolescents from the families of psychiatric control adolescents. As the present study employed a heterogeneous general psychiatric control group, it is not known whether reports of high cohesion are specific to anorexia nervosa or may also be associated with other more narrowly defined psychiatric disorders. No specificity of characterization was found for the bulimic type group; however, it was speculated that bulimic type subjects' families may also value high cohesiveness but be unable to maintain the appearance of cohesion due to greater familial affective instability. Similarly, while the family sociocultural milieu variables of achievement orientation,

traditional sex role ideology, and weight and appearance orientation were hypothesized as potentially specific to eating disorders, no significant differences were found amongst the groups of the present study on these measures. Again, speculations were offered regarding this lack of congruence with the theoretical literature, with the aim of providing ideas to stimulate further research.

As mentioned previously, anorexia nervosa and bulimia nervosa are considered to be multidetermined disorders of eating. Thus, while family cohesion values may be a contributing factor in the genesis of eating disorders, the influence of family environment will be exerted within a multidimensional context. An eating disorder will only develop as a result of complex, and as yet undetermined, interactions of biological, personality, psychopathological, family, and sociocultural factors (e.g., Bruch, 1973; Garner & Garfinkel, 1980; Johnson et al., 1987; Strober & Yager, 1984).

Some of these other factors may help to explain why not all children in a family develop a disorder of eating, or why one child develops anorexia nervosa while another develops bulimia nervosa. For instance, the general sociocultural milieu may help explain why girls and women are much more likely than boys and men to develop an eating disorder. Also, the recent literature has put forth interesting suggestions as to how genetic differences in personality may contribute to the origin of anorexia nervosa versus bulimia nervosa; in particular, it has been suggested that more affectively



unstable genotypes may manifest in bulimia nervosa (Hsu et al., 1990), whereas more avoidant genotypes may manifest in anorexia nervosa (Strober et al., 1990). Similarly, biological differences in the regulation of weight set point may contribute differentially to anorexia nervosa and bulimia nervosa (e.g., Garner et al., 1984; Keesey, 1986; Striegel-Moore et al., 1986). It is of note, however, that even monozygotic twins, who share the same genetic material and family environment, do not show 100% concordance for eating disorders. Evidence suggests that unshared environmental factors are a more important source of variance in personality and psychopathology development than shared environmental influences (Strober et al., 1990). Thus, it is likely that such factors as the different roles and experiences of siblings within a family, and the extrafamilial experiences at school and with peers, play important, but difficult to assess, roles in the development of eating disorders. There is also, as Paul Meehl wrote, the "random walk" of life--the accumulation of perhaps-minor events an individual is exposed to in his or her life, often only as a result of luck or chance (Meehl, 1978). The development of disorders as complex as anorexia nervosa and bulimia nervosa, as well as of personality and psychopathology in general, is subject to the myriad of inexplicable and unknown influences which impact upon every human life, and of which we are so infinitesimally aware.

### Limitations of the Present Study

One of the main limitations of the present study is the reliance on self-report measures. Especially given the denial or lack of self-awareness common in eating-disordered subjects and possibly their parents, such reliance on self-report could be misleading. However, taking possible denial or minimization into account, it is of interest to determine what subjects perceive and/or are willing to report. The addition of more objective or observational measures could provide useful contextual information to the reports of family members. For instance, nonsystematic and unstandardized observation in the present study sometimes yielded information contradictory to self-report, particularly in the restrictive anorexic mothers and daughters. In general, it might also be useful to start employing and/or developing more specific measures of family characteristics and functioning than are currently in use. In the present study, some null results may have been a function of multifaceted constructs not being adequately assessed. Given the comorbidity of eating disorder samples, very specific measures may be necessary to tap subtle differences between groups.

The small sample size is another weakness of the present study. Cross-validation of the results with a larger sample would be useful. This is particularly a problem with respect to the bulimic type group. Another limitation is that the clinical groups had been receiving treatment for an average of 9 months before participating in the study. This resulted in

eating disorder subjects participating after progress had been made and symptoms were often no longer at an acute or crisis stage. Thus, many restrictive anorexic subjects' weights were no longer less than 85% of that expected for age and height, although it is of note that their weights were 20% below those of girls in the other three groups (see Table 4). Similarly, the bulimic type group was composed of 8 subjects who currently met diagnostic criteria for bulimia nervosa, and 6 who had met such criteria in the recent past but did not at the time of participation. Strength of results, therefore, could have been diminished due to duration of treatment and partial symptomatic recovery. On the other hand, the duration of treatment also serves to decrease the probability that reported family interaction is solely a function of current crisis because of acute symptomatology.

Finally, the results of the present study are of limited generalizability. The nonpsychiatric control group is composed of self-selected volunteer subjects. There was a high rate of participation within the clinical groups; however, all clinical subjects were currently receiving psychological treatment. Thus, results are only generalizable to families whose daughter is in treatment at an early stage of her disorder. While such a sample is invaluable in terms of providing information on the factors present in the initial stages of an eating disorder, it cannot be assumed to yield results generalizable to more chronic eating-disordered women

who do not receive treatment until after having suffered many years from anorexia nervosa or bulimia nervosa.

#### Questions and Recommendations for Future Research

The recent research examining variations in family environment amongst bulimic subjects with respect to level of depression (Blouin et al., 1990; Wonderlich & Swift, 1990b), borderline personality disorder features (Johnson et al., 1989; Wonderlich & Swift, 1990a), and history of childhood sexual abuse (Bulik et al., 1989) is stimulating and thought-provoking. It would be of interest to extend this research in future to samples of restrictive anorexic and psychiatric control subjects and their parents. The results of the subsidiary analyses of the present study, while preliminary, suggest that such research might be fruitful and may yield information on the specificity of family variables to anorexia and/or bulimia nervosa. Also, in terms of specificity, increasingly homogeneous psychiatric control groups could be employed in attempts to determine family factors of importance in various disorders and to investigate combinations of factors which may be specific to eating disorders, either alone or as part of a subgroup of psychiatric disorders. Similarly, it would be of interest to compare groups of borderline, depressed, or sexually abused subjects with and without eating disorders to gain an increasingly fine-tuned understanding of the family environments of different psychiatric populations.

Another question of interest concerns the direction of influence with respect to the association between family environment and eating disorders. Research designs which could illuminate this issue are extremely prohibitive in terms of the time and resources which must be invested in them; however, it would appear that there is currently sufficient basic information available to make such research endeavors worthwhile. Pike and Rodin's (1991) recent study provides a good example of how a nonclinical eating-disordered (or at-risk) sample may be selected and yield interesting results. It would be of great interest to select such a sample and follow it prospectively with a view to observing and predicting which subjects develop diagnosable eating disorders. Similarly, it would be of interest to follow an adolescent sample of eating-disordered subjects and their parents, such as that of the present study, to investigate if there are changes in family functioning as an eating disorder becomes more chronic and/or as restrictive anorexic subjects develop bulimic symptomatology.

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## Appendix

### Subsidiary Analyses: Family System/Interaction Hypothesis

Four 2(High/Low) (Depression, Distress, Impulsivity, or Eating Disorder Symptomatology) X 2(Relation) between-within groups MANOVAs were conducted. (The main effect of Relation was not of interest and, therefore, was not examined.) The dependent variables were FES-Cohesion, FES-Expressiveness, FES-Conflict, FES-Independence, FES-Organization, and FES-Control. Depression was operationalized by scores on the BSI-Depression scale. A standard T-score of 60, or 1 standard deviation above the mean on the female adolescent norms, was used to define high/low; thus, daughters with scores greater than 1.51 comprised the High Depression group and daughters with scores less than or equal to 1.51 comprised the Low Depression group. Similarly, Distress was operationalized by the BSI-General Severity Index. Daughters with scores above 1.39 comprised the High Distress group and those with scores less than or equal to 1.39 comprised the Low Distress group. Impulsivity was defined by the number of impulse-related behaviors reported. The grand mean on this measure was 2.06; hence, daughters with scores greater than 2 comprised the High Impulsivity group and daughters with scores less than or equal to 2 comprised the Low Impulsivity group. And finally, Eating Disorder Symptomatology was operationalized by scores on the EAT-26. The recommended cut-off of 20 was employed such that daughters with scores greater than 20 comprised the High group

and daughters with scores less than or equal to 20 comprised the Low group.

As an indication of the composition of the study's four groups with regard to the four factors above, percentages are presented in Table 16. There are, of course, no daughters from the psychiatric or nonpsychiatric control groups in the High Eating Disorder Symptomatology group as the selection criteria excluded daughters with EAT-26 scores greater than 20 from these groups.

Table 16

Composition of Study's Groups

	Restrict. Anorexic	Bulimic Type	Psych. Control	Nonpsych. Control
DEPRESSION:				
High	35%	79%	35%	12.5%
Low	65%	21%	65%	87.5%
DISTRESS:				
High	40%	71%	30%	4%
Low	60%	29%	70%	96%
IMPULSIVITY:				
High	30%	50%	40%	33%
Low	70%	50%	60%	67%
E.D. SYMPTOMS:				
High	70%	79%	0%	0%
Low	30%	21%	100%	100%

The 2(Depression) X 2(Relation) MANOVA was significant for the Depression by Relation interaction ( $F(6, 71) = 4.51$ ,

$p < .002$ ) and for Depression ( $F(6, 71) = 2.70, p < .03$ ). The means for the six dependent measures for daughters and mothers are presented in Table 17. Subsequent ANOVAs, with modified alpha of .017 (.10 divided by 6), showed significant interaction effects for Cohesion ( $F(1, 76) = 9.24, p < .004$ ), Conflict ( $F(1, 76) = 10.04, p < .003$ ), Independence ( $F(1, 76) = 10.46, p < .003$ ), and Organization ( $F(1, 76) = 12.06, p < .002$ ). Tests of simple main effects revealed significant group differences for daughters but not for mothers. Thus, the Depression effects for mothers on Cohesion, Conflict, Independence, and Organization were all nonsignificant, whereas the effects of Depression for daughters on Cohesion ( $F(1, 135) = 12.55, p < .001$ ), Conflict ( $F(1, 134) = 11.98, p < .001$ ), and Independence (corrected for heterogeneity;  $F'(1, 41) = 12.97, p < .001$ ) were all significant. The result for Organization for daughters was nonsignificant. Neither the interaction effect nor the Depression effect for Expressiveness or for Control were significant.

The MANOVA for Distress was significant for Distress ( $F(6, 71) = 2.40, p < .04$ ) and for the Distress by Relation interaction ( $F(6, 71) = 2.55, p < .03$ ). The means are presented in Table 18. The follow-up ANOVAs were significant for the Distress by Relation interaction for Conflict ( $F(1, 76) = 6.53, p < .017$ ) and for Independence ( $F(1, 76) = 9.33, p < .004$ ). The tests of the simple main effects of Distress on Conflict were not significant for mothers or for daughters. The simple main effect of Distress on Independence was significant for



daughters ( $F(1, 152) = 21.07, p < .001$ ), but not for mothers. The 2 X 2 ANOVA interaction effects were not significant for

Table 17

Low versus High Depression Group Means (Standard Deviations)

VARIABLE	RELATION	Low Depression (n=50)	High Depression (n=28)
Cohesion	Daughter	6.14 (2.55)	4.14 (2.85)
	Mother	6.80 (2.12)	6.75 (2.01)
Expressiveness	Daughter	4.32 (2.11)	3.21 (1.83)
	Mother	6.00 (1.95)	5.61 (1.83)
Conflict	Daughter	3.76 (2.19)	5.50 (1.99)
	Mother	3.88 (2.17)	3.82 (2.07)
Independence	Daughter	6.52 (1.40)	4.93 (2.09)
	Mother	6.54 (1.28)	6.57 (1.48)
Organization	Daughter	5.82 (2.02)	4.39 (2.62)
	Mother	5.48 (2.39)	5.68 (2.39)
Control	Daughter	4.96 (2.37)	5.21 (2.57)
	Mother	5.00 (1.98)	4.39 (2.25)

Table 18

Low versus High Distress Group Means (Standard Deviations)

VARIABLE	RELATION	Low Distress (n=53)	High Distress (n=25)
Cohesion	Daughter	5.87 (2.80)	4.48 (2.65)
	Mother	6.79 (2.13)	6.76 (1.99)
Expressiveness	Daughter	4.32 (2.08)	3.08 (1.82)
	Mother	6.02 (1.93)	5.52 (1.85)
Conflict	Daughter	3.96 (2.28)	5.28 (2.01)
	Mother	3.93 (2.24)	3.72 (1.88)
Independence	Daughter	6.49 (1.50)	4.80 (1.98)
	Mother	6.59 (1.34)	6.48 (1.39)
Organization	Daughter	5.42 (2.41)	5.08 (2.20)
	Mother	5.32 (2.34)	6.04 (2.44)
Control	Daughter	4.87 (2.45)	5.44 (2.40)
	Mother	4.74 (2.11)	4.88 (2.07)

Cohesion, Expressiveness, Organization, or Control. Similarly, the main effects of Distress were nonsignificant for Cohesion, Expressiveness, Organization, and Control.

The MANOVA for Impulsivity yielded a significant Impulsivity by Relation interaction effect ( $F(6, 71) = 3.14, p < .01$ ) and a nonsignificant Impulsivity main effect. The means for the Low versus High Impulsivity groups are presented in Table 19. The subsequent ANOVAs revealed significant interaction effects for Cohesion ( $F(1, 76) = 7.78, p < .008$ ), Conflict ( $F(1, 76) = 11.69, p < .002$ ), and Independence ( $F(1, 76) = 6.41, p < .017$ ). Tests of simple main effects showed that the main effect of Impulsivity on Cohesion was significant for daughters ( $F(1, 134) = 6.93, p < .01$ ), but not for mothers; that the main effect on Conflict was significant for daughters ( $F(1, 132) = 7.29, p < .01$ ), but not for mothers; and that neither the main effect on Independence for mothers nor the corrected-for-heterogeneity main effect on Independence for daughters were significant.

The Impulsivity by Relation interaction effects for Expressiveness, Organization, and Control were all nonsignificant. Similarly, the main effect of Impulsivity was nonsignificant for Expressiveness, Organization, and Control.

Finally, the 2 X 2 MANOVA for Eating Disorder Symptomatology was nonsignificant for the main effect and the interaction effect. The means for the Low versus High Eating Disorder Symptomatology groups are presented in Table 20.

Table 19

Low versus High Impulsivity Group Means (Standard Deviations)

VARIABLE	RELATION	Low Impulsivity (n=49)	High Impulsivity (n=29)
Cohesion	Daughter	5.98 (2.76)	4.48 (2.69)
	Mother	6.67 (2.25)	6.97 (1.74)
Expressiveness	Daughter	4.16 (2.11)	3.52 (1.99)
	Mother	5.88 (2.01)	5.83 (1.75)
Conflict	Daughter	3.88 (2.20)	5.24 (2.15)
	Mother	4.06 (2.23)	3.52 (1.92)
Independence	Daughter	6.18 (1.40)	5.55 (2.38)
	Mother	6.31 (1.34)	6.97 (1.27)
Organization	Daughter	5.67 (2.28)	4.69 (2.35)
	Mother	5.96 (2.35)	4.86 (2.30)
Control	Daughter	5.16 (2.39)	4.86 (2.53)
	Mother	5.18 (2.09)	4.10 (1.93)

Table 20

Low versus High Eating Disorder Symptomatology Group Means  
(Standard Deviations)

VARIABLE	RELATION	Low E.D. Symptomatology (n=53)	High E.D. Symptomatology (n=25)
Cohesion	Daughter	5.38 (2.89)	5.52 (2.69)
	Mother	6.81 (2.09)	6.72 (2.05)
Expressiveness	Daughter	3.98 (1.97)	3.80 (2.33)
	Mother	5.98 (2.01)	5.60 (1.68)
Conflict	Daughter	4.32 (2.46)	4.52 (1.85)
	Mother	3.85 (2.18)	3.88 (2.05)
Independence	Daughter	6.23 (1.48)	5.36 (2.36)
	Mother	6.42 (1.34)	6.84 (1.34)
Organization	Daughter	5.36 (2.35)	5.20 (2.36)
	Mother	5.60 (2.48)	5.44 (2.20)
Control	Daughter	5.30 (2.42)	4.52 (2.42)
	Mother	5.11 (2.12)	4.08 (1.87)