# THE RELATIONSHIP OF EXERCISE DURATION TO DISORDERED EATING, PHYSICAL SELF-ESTEEM, AND BELIEFS ABOUT ATTRACTIVENESS

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The purpose of this study was to examine the relationship between exercise duration and level of disordered eating, physical self-esteem, and endorsement of societal mores about attractiveness. Two hundred twenty-nine female college students completed the Bulimia-Test Revised, the Physical Self Perception Profile, the Beliefs About Attractiveness Questionnaire, and a demographic questionnaire. Subjects were classified into one of four levels of exercise duration based on the number of hours they reported engaging in planned exercise per week.

Significant differences were identified among the four exercise groups in relation to physical self-esteem. The amount of exercise activity individuals engaged in per week, however, was not indicative of their eating disorder symptomatology or beliefs about attractiveness.

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# CHAPTER I

## INTRODUCTION

To provide an in depth review of the eating disorder literature, this chapter has been divided into several topic areas, including: (1) the epidemiology of disordered eating, specifically Anorexia Nervosa and Bulimia Nervosa; (2) psychological and behavioral correlates of disordered eating; and (3) sociocultural and familial aspects of individuals with disordered eating. In addition, the relationship of exercise to eating disorders will be discussed in the final section.

### Epidemiology

According to the DSM-III-R, the criteria for Anorexia Nervosa include: (1) a refusal to maintain body weight over a minimal normal weight for age and height; (2) an intense fear of gaining weight even if underweight that may be accompanied by a reduction in total food intake and extensive exercising; (3) amenorrhea; and (4) a distorted body image. The characteristics of Bulimia Nervosa include: (1) recurrent episodes of binge eating accompanied by feelings of lack of control; (2) self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain; (3) a

minimum of two binge eating episodes a week for at least three months; and (4) a persistent overconcern with body shape and weight (APA, 1987). In addition, the DSM-III-R provides a diagnostic category for those individuals who do not meet the criteria for the previously two mentioned categories, yet have an eating disorder (i.e., eating disorder NOS).

Although anorexia nervosa and bulimia were once considered to be extremely rare, recent research has shown them to be more prevalent than initially thought (Mitchell & Eckert, 1987). Using strict DSM-III-R (American Psychiatric Association, 1987) criteria, the prevalence of bulimia generally has ranged between one and five percent among college women (Mitchell & Eckert, 1987; Schlesier-Stropp, 1984). For anorexia nervosa, researchers have estimated that approximately two to four individuals per hundred thousand people suffer from this disorder (Kendall, 1973; Szmukler, 1985).

As prevalence studies often incorporate diagnostic criteria other than those specified by the DSM, estimates concerning the incidence of bulimia and anorexia nervosa vary drastically. In addition, this variation in prevalence rates has been influenced by differences in sampling and the methods utilized for establishing cases (Connors & Johnson; 1987; Stein, 1991; Szmukler, 1985). Although this study utilized questionnaires based on DSM-III-R, research

incorporating other diagnostic criteria also will be mentioned. For the most part, as this study focused on female college students, the majority of studies reviewed will be concerned with this same population.

Pope, Hudson, Yurgelun-Todd, and Hudson (1984) administered a questionnaire based on DSM-III criteria to three samples of students, including two colleges and a secondary school. Based on responses of 1060 individuals included in the three samples, none of the male respondents met DSM-III criteria for either bulimia or anorexia nervosa. However, one to 4.2% of women had a history of anorexia nervosa, while 6.5 to 18.6% had a history of bulimia.

Differing from the above findings, Katzman, Wolchik, and Braver (1984) found a lower prevalence of bulimia in a sample of college students with 3.9% of 485 females meeting DSM-III criteria for bulimia. However, 56% of the sample displayed binge eating behavior but did not meet DSM-III criteria for bulimia. Similarly, Hart and Ollendick (1985) found in a sample of 139 working women and 234 college students that only 2 (1.4%) of the working women and 12 (5.0%) of the university women displayed the syndrome of bulimia based on DSM-III criteria. Once again, bingeing behavior was found in more individuals, with 57 (41%) of the working women and 161 (69%) of the university women reporting such behavior (Hart & Ollendick, 1985). Likewise, Mintz and Betz (1988) found in a sample of 643 female

undergraduates that only 3% were classified as bulimic according to DSM-III-R criteria, while 61% were classified as having some intermediate form of eating-behavior problem (i.e., chronic dieting, bingeing or purging alone, or subclinical bulimia).

Pyle, Neuman, Halvorson, and Mitchell (1991) administered questionnaires based on DSM-III criteria to 1836 freshmen college students. Furthermore, to better assess the prevalence of DSM-III-R bulimia nervosa, they operationalized criteria from the current questionnaire based on DSM-III-R draft criteria at the time the questionnaire was analyzed, including: (a) recurrent episodes of binge eating that occurred at a frequency of more than once a week; (b) self-induced vomiting, laxative abuse, or 24 hour fasting that occurred more than once weekly, and the use of strict diets to control the effects of binge eating or to control weight; and, (c) a fear of being fat and feeling fat even though other people might disagree. These operationalized criteria did not include exercise as a weight-control measure. Similar to Katzman and colleagues (1984), they found that 4.7% of females reported a current eating disorder diagnosis, including bulimia ($n$ = 39, 4.3%), bulimia nervosa ($n$ = 20, 2.2%), bulimia with weekly binge/purging behavior ($n$ = 10, 1.1%), and anorexia nervosa ($n$ = 1, 0.1%). Individuals were classified as bulimic if they met DSM-III criteria, while

individuals identified with bulimia nervosa met DSM-III-R draft criteria. Current bulimia was reported by 0.1% (n = 1) of males and current bulimia nervosa by 0.3% (n = 3). Pyle and colleagues (1991) concluded that the frequency of eating disorders among college students appears to have reached a plateau and may be on the decline. They noted, however, that although there was a decrease in the overall frequency of binge eating in nonbulimic women, there was a simultaneous increase in self-induced vomiting among these same women. Since six women who did not meet diagnostic criteria for an eating disorder reported treatment for bulimia, Pyle et al. (1991) suggested that additional attention should be given to eating disordered behaviors that might not meet current DSM criteria.

In addition to the previously mentioned studies, researchers have begun to assess the prevalence of eating disorders within other cultures. For example, Nevo (1985) administered diagnostic eating disorder questionnaires to a sample of female college women, including 505 Caucasians, 148 Asians, and 25 African Americans. Based on DSM-III criteria, 70 (14%), 5 (2.7%), and 1 (4%) of the Caucasian, Asian, and African-American women were classified as bulimic, respectively. Furthermore, African-Americans and Asians generally tended to score lower on eating disorder measures than did Caucasians. Similarly, Nasser (1986) compared the eating attitudes of female Middle Eastern

students studying at London and Cairo Universities. She found that 22% of the London group and 12% of the Cairo group scored above the clinical cutoff score on the Eating Attitudes Test (Garner, Olmstead, Bohr, & Garfinkel, 1982). However, while six (12%) of the London group met Russell's criteria for bulimia nervosa, none of the Cairo group was classified as bulimic. In addition, no cases of anorexia nervosa were found in either group. Nasser (1986) noted that the London group appeared to be more Westernized in their appearance and dress, while the Cairo group dressed in the more traditional manner.

Contrary to Nasser's (1986) study, Whitehouse and Mumford (1988) found in a sample of 204 Asian and 355 Caucasian schoolgirls that the mean Eating Attitudes Test (Garner, et al., 1982) score of the Asian girls was significantly higher than that of the Caucasian girls. One Asian and one Caucasian girl met DSM-III-R criteria for anorexia nervosa, whereas seven Asian and three Caucasian girls met DSM-III-R criteria for bulimia nervosa. The equivocal results regarding prevalence of eating disorders in non-Anglo cultures emphasizes the need for further research in this area.

Connors and Johnson (1987) reviewed seventeen prevalence studies and concluded that about eight.percent of women and one percent of males met the DSM III criteria for bulimia. They, however, found widespread discrepancies in

prevalence rates due to (a) differences among the populations surveyed (i.e., college students vs. women interviewed while shopping), (b) differences among samples on variables such as socioeconomic status, age, and racial composition, (c) inappropriately generalizing from low response rates, and (d) methodological issues, such as utilizing self report measures with unknown validity. With respect to possible gender differences, Conners and Johnson (1987) found that females tended to demonstrate significantly higher rates of bulimic behaviors and bulimia than males with the average age of onset of bulimia being around 18. The prevalence studies they reviewed, however, provided little information on the differences in incidence of eating disorders that might be attributable to race, ethnicity, or religion. In conclusion, these authors noted that "The best studies have large sample sizes with demographic information reported, a very high return rate, validity checks [to minimize use of questionnaires with unknown validity in research], clear definitions of bingeing and of bulimia, and have collected information on bingeing and purging which includes frequency variables "(p.173).

Stein (1991) reviewed sixty-six studies and concluded that researchers' use of DSM-III-R diagnostic criteria, versus DSM-III criteria, has probably contributed to recent reports of lower prevalence rates due to the inclusion of criteria indicating the number of binges which must be

present for diagnosis. For example, when utilizing DSM-III criteria, Pope, Hudson, Yurgelun-Todd, and Hudson (1984) found that 6.5 to 18.6% of college and high school females had a history of bulimia. On the other hand, Mintz and Betz (1988) classified only three percent of their sample of 682 college females as bulimic when utilizing DSM-III-R criteria. Stein (1991) discovered the highest prevalence rates were reported for college women using broad, unmodified, DSM-III criteria (no binge frequency), assessed via paper-and-pencil measures, with rates across seven studies of college women ranging from 7.7 to 19%. These rates dropped by 50% when bingeing frequency alone was incorporated, and an additional 50% when bingeing frequency was used in conjunction with purgative methods (Stein, 1991). Furthermore, lower prevalence rates were found when clinical interviewing was employed as opposed to paper and-pencil questionnaires. Stein (1991), however, noted that the Bulimia Test (Smith & Thelen, 1984) produced much lower prevalence estimates than most other inventories due to its stable factor structure and recommended cut-off scores. In conclusion, he noted that the variability in prevalence rates across studies was in general due to (a) the use of broad versus strict diagnostic criteria, (b) whether or not purgative methods were required as part of the diagnosis, (c) age of subjects and population sampled (e.g., college

versus high school), and (d) reliance on paper-and-pencil inventories for diagnosis versus clinical interviews.

The incidence of anorexia nervosa is considerably less than that of bulimia nervosa. In a study of over 600 undergraduate women, Mintz and Betz (1988) classified eight individuals in the anorexic weight category as opposed to 20 being classified as bulimic based on a paper and pencil questionnaire. Similarly, using a paper and pencil questionnaire, Pope, Hudson, and Yurgelun-Todd (1984) reported that only two individuals out of a sample of 300 female shoppers had a history of anorexia nervosa as opposed to 31 having a history of bulimia.

The occurrence of anorexia nervosa appears to be more common in higher SES females (Mann, Wakeling, Wood, Monck, Dobbs, & Szmukler, 1983; Szmukler, 1983). Using EAT scores and follow-up interviews, Mann and colleagues (1983) detected no cases of anorexia nervosa in a public high school population of 262 fifteen year-old females. Similarly, Szmukler (1983) found the prevalence of anorexia nervosa considerably lower in public as opposed to private high schools, with only about one in 700 girls age 16 or older in public schools having a history of anorexia nervosa. Crisp, Palmer, and Kalucy (1976) retrospectively surveyed seven private and two public high schools' records over a five to six year period. They discovered one severe case of anorexia nervosa per one hundred girls over age

sixteen in private schools, and one case per five hundred fifty girls in public schools. Based on Eating Attitudes Test scores and follow-up interviews, Szmukler (1983) estimated that one in 90 females aged 16 to 18 from six private high schools could be diagnosed with anorexia nervosa.

Regardless of the variability in prevalence rates for bulimia and anorexia nervosa, there appears to be a large percentage of individuals who display disordered eating characteristics (e.g., bingeing or purging alone, chronic dieting) but do not meet strict eating disorder diagnostic criteria (Klemchuk, Hutchinson, & Frank, 1990; Mintz & Betz, 1988; Polivy & Herman, 1987; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). Mintz and Betz (1988) found that 61% of undergraduate women had some intermediate form of eating-behavior problem, such as chronic dieting, bingeing or purging, or subclinical bulimia. Only 33% of the subjects surveyed for their study reported what might be considered normal eating habits. Similarly, Polivy and Herman (1987) argued that society's shift toward a thinner physique has led to increases in the prevalence of dieting. In addition, they suggested that, for many North American women, "normal eating" was characterized by dieting. They concluded that many non-eating disordered women actually display characteristics associated with eating disorder pathologies. In support of this conclusion, Klemchuk,

Hutchinson, and Frank (1990) found a high degree of body dissatisfaction among college women based on Eating Disorder Inventory scores. The individuals in the body dissatisfaction group, however, generally were not engaging in bulimic behaviors which were severe enough to warrant a diagnosis of bulimia nervosa.

In comparing two independent samples of female adolescents which were collected in 1981 and 1986 at the same suburban high school, Johnson, Tobin, and Lipkin (1989) found a 50% reduction in bulimic behaviors, a marked decrease in the prevalence of dieting behaviors, and a reduction in preoccupation with thinness. They also found, however, that the degree of body dissatisfaction did not change across samples from 1981 and 1986. As there were no attitudinal changes pertaining to acceptance of one's body, these researchers hypothesized that as society becomes more concerned with physical fitness, "the pursuit of strength" may replace the "drive for thinness" as a way by which women will demonstrate mastery, success, and physical beauty. Subsequently, this shift may lead to a new set of symptoms which may be associated with intensive exercise (Johnson, Tobin, & Lipkin, 1989).

Earlier research regarding the prevalence of eating disorders appeared to be focused on differentiating between individuals who met strict diagnostic criteria for an eating disorder and normal non-eating disordered individuals.

Current investigators, however, appear to be addressing the occurrence of disordered eating behaviors in individuals that do not meet strict diagnostic criteria for an eating disorder. Specifically, researchers are currently addressing the prevalence of disordered eating behavior within non-clinical populations (e.g., college students) by viewing disordered eating as occurring along a continuum of severity. So far, most researchers have found a significant percentage of individuals who display disordered eating characteristics without meeting strict diagnostic criteria.

On the other hand, some researchers have found that the prevalence of eating disorders (i.e., anorexia and bulimia nervosa) has begun to decline (Johnson, et al., 1989; Pyle et al., 1991). These researchers suggested, however, that an increasing emphasis on physical fitness may be replacing the drive for thinness, thus creating a new set of psychosomatic symptoms (i.e., exercise abuse). More research in this area would be helpful in identifying individuals who may not be displaying classical diagnostic criteria for an eating disorder, but may nevertheless be exhibiting pathogenic weight-control behaviors (e.g., self-induced vomiting, excessive exercising, binges more than twice weekly).

Psychological and Behavioral Correlates

Individuals diagnosed with an eating disorder (i.e., anorexia nervosa or bulimia) evidence higher levels of

psychological and eating-related disturbances than normal, non-eating disordered individuals (Blouin, 1985; Katzman & Wolchik, 1984; Laessle, Tuschl, Waadt, & Purke, 1989; Thompson, Berg, & Shatford, 1987; Williamson, Kelley, Davis, & Ruggiero, 1985). For example, Katzman and Wolchik (1984) found that women with bulimia nervosa, relative to a non-eating disordered control group, experienced greater dieting concern, greater need for approval, higher self expectations, poorer body image, lower self-esteem, and greater depression. Similarly, these women had greater dieting concern, more binge eating behaviors, lower self-esteem, poorer body attitudes, greater need for approval, and greater depression than binge-eaters. According to Katzman and Wolchik (1984), bulimia and binge-eating reflected two distinct variants in a spectrum of eating disorders with thirty-three percent of the bulimic group reporting a history of anorexia nervosa. Relative to the controls, the binge-eaters exhibited greater dieting preoccupation and higher binge eating scores with 14 being the average age of onset for binge-eating behavior; purging behavior generally began at 17. For the women with bulimia, the average age of onset for bingeing behavior was 15 with purging behavior beginning four years later (Katzman & Wolchik, 1984).

Williamson and colleagues (1985) compared three groups of women consisting mainly of students or university staff

personnel (15 bulimics, 15 normals, and 15 obese) to determine if differences existed among them in terms of level of psychopathology. Using psychometrically sound measures (i.e., the Minnesota Multiphasic Personality Inventory, the Hopkins Symptom Checklist 90, and the Beck Depression Inventory) and a body image assessment procedure, they found that bulimics evidenced more psychopathology than did the normal or obese subjects, including being more depressed, anxious, neurotic, and impulsive. Similarly, bulimics evidenced greater body image distortion, such that they perceived themselves as being larger and wanted to be smaller than the other two groups. Both bulimic and obese subjects, however, demonstrated more obsessive thinking, preoccupation, guilt, and alienation than normal subjects. Although the small sample size may limit the generalizability of their findings, Williamson and colleagues (1985) suggested that these characteristics may be common to bulimic and obese individuals and this could play a role in the etiology of the two eating pathologies.

As research suggested that bulimics experience higher levels of depression than normal non-eating disordered individuals (Katzman & Wolchik, 1984; Williamson, et al., 1985), investigators became interested in assessing the relationship between depression and the cognitive characteristics of individuals with eating disorders (Elmore & Castro, 1990; Laessle, Kittl, Fichter, & Pirke,

1988; Weisberg, Norman, & Herzog, 1987). Laessle et al. (1988) examined the relationship between depression and cognitive factors associated with body shape and weight in 99 female patients with anorexia nervosa and bulimia. They found that four scales measuring cognitive features explained between 34 and 45% of the depression variance. Of the cognitive factors, the strongest predictor of depression was "negative body attitudes." Specifically, drive for thinness correlated with depression in the total sample, while perfectionism was related to depression only in the bulimic group. In general, Laessle and colleagues (1988) concluded that distorted attitudes of eating disordered individuals may lead to depression. Specifically, they suggested that self-imposed pressures towards an ideal shape and weight may lead to a negative evaluation of one's own body and self concept and ultimately to feelings of depression.

Similar to Laessle et al. (1988), Elmore and Castro (1990) found that untreated bulimics' depression appeared to be a result of bulimic behavior. Using 19 bulimics, 12 recovered bulimics, and 21 normal controls, they compared self-rated moods and hunger in association with eating. Bulimics, similar to recovered bulimics and controls, appeared to be aware of and able to respond appropriately and normally to their internal state of hunger and fullness. Bingeing behavior, however, appeared to be associated with

bulimic individuals affective state in that bingeing occurred when anxiety was high, which correspondingly resulted in a lowering of anxiety, but an increase in guilt and depression (Elmore & Castro, 1990). In contrast to feelings during and after the binge, however, Cooper, Morrison, Bigman, Abramowitz, Levin, & Krener (1988) found that feelings just after the purge seemed relatively calm and pleasurable in females diagnosed with an eating disorder. These researchers concluded that the binge-purge cycle appears to be associated with characteristic mood disturbances which may lead to a depressive condition over time, as individuals may feel trapped in a pathological self reinforcing cycle characterized by overall feelings of helplessness and lack of self-control.

In addition to research regarding depressive symptomatology in individuals with disordered eating, researchers have begun to investigate the comorbidity of eating disorders and personality disorders. Schmidt and Telch (1990) found that personality disorders were more prominent in eating disordered than non-eating disordered individuals. Out of 69 female college subjects assessed via two structured clinical interviews and self-report questionnaires, they found that 14 of 23 (61%) bulimic subjects met DSM-III-R criterion for a personality disorder. In comparison, only three of 23 (13%) binge eaters and one of 23 (4%) normal subjects received a personality disorder

diagnosis. Relative to binge eaters and normals, bulimics exhibited significantly more depression, impulsivity, self-defeating behavior, and lower self esteem, with the most predominant personality disorders being borderline, self-defeating, and schizotypal. These researchers suggested that characteristics of the borderline personality disorder, such as impulsivity, affective lability, and depression, may contribute to episodes of disregulation of dietary restraint and the resulting binge-purge cycle. Although this finding appears to lend support to the development of eating disorders in conjunction with a personality disorder (e.g., borderline personality disorder), without further research utilizing longitudinal designs, conclusions are tentative at best.

Rather than comparing eating disordered groups and non-eating disordered groups, researchers have begun investigating the possibility of disordered eating occurring along a continuum of severity (Mintz & Betz, 1988; Thompson, Berg, & Shatford, 1987). Thompson and colleagues (1987) compared use of food as a coping mechanism and cognitive distortions regarding food, and weight among 95 female college undergraduate students. Of the 95 subjects, nineteen were classified as bulimic based on DSM-III criteria, thirty-five were classified as bulimic-like (i.e., met some but not all essential criteria), and forty-one subjects as symptom-free. The symptom-free, bulimic-like,

and bulimic groups each differed from one another in a linear fashion from low to high, respectively, on the use of food as a coping mechanism, dichotomous thinking, worry, exaggeration, superstitious thinking, personalization, drive for thinness, and lack of interoceptive awareness. Similarly, both the bulimic and bulimic-like groups evidenced greater perfectionism, defeatism, regret, and body-dissatisfaction than the symptom-free group. Thompson and colleagues (1987) concluded that bulimia may be a heterogeneous disorder, occurring along a continuum of severity, with individuals varying on the degree of behavioral, affective, and attitudinal characteristics of bulimia they exhibit.

In conjunction with viewing characteristics of eating disorders as falling along a continuum of severity, some researchers have described a two component model of eating disorders that differentiates between "normal" restrained eaters (i.e., dieters) and eating disordered individuals (Laessle, Tuschl, Waadt, & Pirke, 1989; Polivy & Herman, 1987). One component of psychopathology includes intense fear associated with weight, appearance, body shape and eating, and the tendency to lose control over eating; this component is present for both bulimic and "normal" restrained eaters (i.e., dieters). The second component comprises specific features such as ineffectiveness, difficulty in assessing internal cues of hunger, and

interpersonal distrust and are fundamental to eating disorders; thus, this component is present primarily in eating disordered individuals (Laessle, et al., 1989; Polivy & Herman, 1987).

In support of the two-component model, Laessle, Tulsch, Waadt, and Pirke (1989), similar to Thompson et al. (1989), found that bulimic women evidenced greater dissatisfaction with their current body and a greater desire for thinness than restrained normal women (i.e. dieters) and unrestrained normal women. Furthermore, the restrained eaters differed significantly from the unrestrained eaters on measures assessing body dissatisfaction and drive for thinness. Unlike Thompson et al. (1987), however, Laessle and colleagues (1989) failed to find differences between the restrained and unrestrained eaters on measures assessing such characteristics as depression, self esteem, and fears about maturity and social relationships.

Similar to Laessle and colleagues (1989), Hurley, Palmer, and Stretch (1990) demonstrated that ineffectiveness, perfectionism, interpersonal distrust, and fears of maturity, as measured by the Eating Disorder Inventory, had no specific association with eating disorders when compared with other psychiatric conditions of comparable severity. They compared responses from non-eating disordered female psychiatric outpatients to female patients diagnosed with anorexia nervosa or bulimia and

found that none of the EDI scales, whose content does not concern weight and eating, discriminated significantly between the eating disordered and non-eating disordered psychiatric patients. Hurley and colleagues (1990) concluded that although the above features may play an important role in the development of eating disorders, they may not be specific only to an eating-disordered population.

For the most part, researchers have agreed that there are some similarities between subclinical disordered eating (i.e., restrained eaters, dieters, bingeing without purging) and eating disorders (i.e., anorexia nervosa and bulimia nervosa), such as preoccupation with weight, appearance, and body shape. Regarding deeper cognitive and internal deficits, however, research investigating the similarities between subclinical disordered eating and eating disorders has been equivocal. Future research in this area is needed to help differentiate between those individuals who develop a full-blown eating disorder (i.e., anorexia nervosa and bulimia) and those who do not (i.e., chronic dieters) as treatment approaches may need to vary accordingly.

Concerns about body shape and weight are predominant characteristics of eating disorders and are expressed in a variety of ways, such as an intense fear of gaining weight, a strong desire to lose weight, and preoccupation with body shape (Cooper & Taylor, 1988; Hadigan & Walsh, 1991; Williamson, Davis, Goreczny, & Blouin, 1989). For example

Williamson et al. (1989) evaluated body image distortion and ideal body-size preferences in 423 undergraduate non-bulimic females and 108 bulimic women. These researchers found that bulimics chose current body sizes that were larger than those picked by non-bulimics regardless of actual body size. Furthermore, bulimics chose thinner ideal body sizes than did non-bulimics regardless of actual body size. Williamson and colleagues (1989) concluded that body-image distortion and extreme preference for thinness may be fundamental characteristics of bulimia nervosa. Williamson et al., however, noted that the study's generalizability may be limited in that no attempt was made to screen from the sample of normal subjects those who chronically dieted or restricted their food intake.

Channon, de Silva, Hemsley, and Mukherjee (1990) compared attitudes toward body-size for anorexic female patients and control subjects. They found that although anorexic patients rated themselves as thinner than did normal subjects, both groups preferred a thinner-than-average body-size when viewing clothed relative to unclothed figures. Regarding anorexic patients, those who had maintained a steady low weight rated themselves as thinner than those who had recently gained weight. When viewing unclothed drawings, the stable-weight group preferred a slightly larger body size than their perceived one, while the recently improved weight group preferred a slightly

thinner than-perceived body size. Thus, the actual degree of dissatisfaction with body-size appeared to be related to the severity and duration of the illness. Channon and colleagues (1990) concluded that the primary distinction between anorexic and normal-weight women may be the emphasis they place upon preferred body- size rather than actual preferred size differences.

Hadigan and Walsh (1991) evaluated body shape concerns in four different groups of women, including (a) 78 outpatients with bulimia nervosa, (b) 14 women with seasonal affective disorder, (c) 10 acquaintances of patients, and (d) 32 normal controls. They found that outpatients with bulimia nervosa expressed more concern over the shape of their body as indicated by their higher Body Shape Questionnaire scores, and in general expressed more concern with shape and weight relative to the other three groups. Although patients with higher Body Shape Questionnaire scores had higher mean Eating Attitudes Test scores and Beck Depression Inventory scores than patients with lower Body Shape Questionnaire scores, there was a notable degree of overlap between the Body Shape Questionnaire scores of the patients with Bulimia Nervosa and the other subjects. These authors concluded that body shape and weight overconcern should remain an essential diagnostic criteria for bulimia nervosa, but suggested that "overconcern" should be interpreted as "above average" rather than "outside the

normal range" as twelve percent of their bulimic women expressed a degree of body shape concern within the normal range.

After reviewing 19 body image studies, Hsu and Sobkiewicz (1991) concluded that although some anorexics and bulimics overestimate their body widths, express more dissatisfaction with their bodies, and wish to be thinner than normal controls, not all eating-disordered patients show such dissatisfaction and some non-eating disordered individuals report dissatisfaction with their bodies too. They cautioned, however, against using the terms "body size estimation" and "body image distortion" interchangeably as the terms are not synonymous. Rather, these researchers concluded that the construct of "body image" cannot be validated independently and therefore believe it is unwarranted to conceptualize body estimation and affect as operational measures of this construct. Hsu and Sobkiewicz (1991) suggested that future research should be focused on body attitudes and feelings rather than estimation of body size in order to differentiate between non-eating disordered individuals and individuals diagnosed with an eating disorder (i.e., anorexia nervosa or bulimia nervosa).

Rather than evaluating overestimation of body size in relation to disordered eating, Shisslak, Pazda, and Crago (1990) compared differences in weight of women from undergraduate psychology courses, three health clubs, and an

eating disorders clinic. The women were classified into six groups: underweight bulimics (n = 20), normal-weight bulimics (n = 31), overweight bulimics (n = 22), restrictor anorexics (n = 20), normal controls (n = 31), and obese subjects (n = 22). They found that the bulimic women in all three weight categories exhibited greater psychopathology, more external locus of control, lower self-esteem, and lower sense of personal effectiveness than non-bulimic women at similar weight levels. Furthermore, the highest psychopathology, lowest self-esteem, and most external locus of control were found among the underweight bulimic women, while the normal weight bulimic women manifested little psychopathology compared to the overweight and underweight bulimic group. The restrictor anorexic group exhibited less neurotic defensiveness, anger and hostility, and discontent and anxiety relative to the other five groups, with lower scores on the Hysteria, Psychopathic Deviate, and Psychasthenia scales of the MMPI. Shisslak and colleagues (1990) concluded that eating disordered women's weight-levels may be related to the severity of the psychopathology and treatment approaches may need to be modified accordingly.

In addition to researching the differences between eating disordered individuals and non-eating disordered individuals, some researchers have focused on investigating the differences and similarities in various subtypes of

eating disorders (e.g., restrictor anorexics and bulimic anorexics) (Rosen, Murkofsky, Steckler, & Skolnick, 1989; Welch, Hall, & Renner; Willmuth, Leitenberg, Rosen, & Cado, 1988; ). Willmuth and colleagues (1988) compared 20 non-eating disordered controls, 20 normal weight purging bulimic women (i.e., bingeing followed by vomiting), and 20 normal weight nonpurging bulimic women (i.e., bingeing with restrictive dieting) utilizing DSM-III-R and DSM-III criteria, respectively. They found that bulimia with vomiting may be associated with a greater level of psychopathology than bulimia without vomiting. Compared to the other two groups, bulimics that engaged in vomiting (i.e., purging bulimics) demonstrated greater (a) anxiety about eating, (b) disturbance on standardized measures of eating attitudes and disorders (i.e. EAT and EDI), (c) body size distortion and desire to be thin, and (d) disturbance on behavioral trait scales of the Eating Disorders Inventory. Although the nonpurging bulimics were more adjusted than the purging bulimics on every measure, they exhibited more (a) anxiety about eating, (b) disturbance on eating disorder questionnaires, and (c) depressive symptoms and lower self-esteem than normal controls (Willmuth et al., 1988).

Similarly, Rosen et al. (1989) compared 19 restricting anorexic, 23 bulimic anorexic, and 72 normal-weight bulimic inpatients on eating disorder symptomatology and related

psychological and depressive characteristics. Of the predominantly female sample (i.e., 9 males were included), the bulimic anorexic group demonstrated the most psychopathology overall. On the Eating Attitudes Test, the Zung Self-Rating Depression scale, and four scales of the Eating Disorder Inventory (i.e., ineffectiveness, perfectionism, interoceptive awareness, and maturity fears), the bulimic anorexics scored higher than the normal weight bulimics. Similarly, the bulimic anorexics scored higher on ineffectiveness and interoceptive awareness than the restricting anorexics. Rosen and colleagues (1989) concluded that bulimic anorexics greater psychopathology may be related to biologically determined weight setpoints given that bulimic anorexics have a higher incidence of premorbid and family history of obesity than restrictors. Thus, it may be useful to retain separate diagnostic categories rather than group all bulimics together, with a concurrent diagnosis of anorexia and bulimia nervosa signaling more severe psychopathology (Rosen, et al., 1989).

Contrary to the above findings, Welch, Hall, and Renner (1990) did not find behavioral and psychological characteristics that clearly differentiated between eating disorder subgroups (i.e., anorexia nervosa restrictors versus bulimic anorexia nervosa and bulimic patients) as described in the DSM-III (APA, 1980). Rather, a cluster analysis of data gathered from 78 anorexic and bulimic

patients revealed heterogeneity in symptomatology across various subgroups of eating disordered patients. Although no differences in behavioral characteristics (i.e., frequency of binge eating, self-induced vomiting, laxative use) were found among eating disordered subgroups (e.g., restricting anorexics vs. bulimic anorexics), two separate clusters of psychological characteristics were identified that distinguished the severity of disordered eating, with individuals in the second cluster demonstrating greater psychopathology on all EDI subscales except "maturity fears" and higher levels of depression (Welch, Hall, & Renner, 1990). Thus, there appears to be differences in severity of disordered eating among individuals, although subcategories of disordered eating do not appear to distinguish between behavioral characteristics in these individuals.

Rather than focusing on purging behavior in bulimics as being indicative of more severe psychopathology, Vanderheyden and Boland (1987) emphasized the importance of eliminating bingeing in treatment of bulimia. These researchers categorized 158 female undergraduates into five groups based on the presence or absence of self-reported vomiting: normals ($n$ = 73), mild ($n$ = 23), moderate ($n$ = 23), and severe bingers ($n$ = 14) and binge vomiters ($n$ = 18). A discriminant function analysis indicated that drive for thinness, dietary restraint, and negative self-image were the strongest discriminators of group membership.

Using these three indicators, 48.34% of the cases were correctly classified, with the binge vomit group showing the lowest hit rate. Most of the misclassifications of individuals appeared to be related to similarities between normals and mild binge eaters, and between severe binge eaters and binge vomiters, with 50% of the binge vomiters being wrongly classified as severe binge eaters. These results support the hypothesis that as bingeing increases in severity, the profile of the binge eater approaches that of the binge vomiter. Vanderheyden and Boland (1987) concluded that if the binge eating could be brought under control, the purging would eliminate itself.

Some researchers have addressed the occurrence of disordered eating in individuals who may not meet strict diagnostic criteria (Kiemle, Slade, & Michael, 1987; Klemchuk, Hutchinson, & Frank, 1990; Mintz & Betz, 1988; Polivy and Herman, 1987; Radke-Sharpe, Whitney-Saltiel, & Rodin, 1990; Striegel-Moore, McAvay, & Rodin, 1986; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989; Striegel-Moore, Silberstein, & Rodin, 1986). Polivy and Herman (1987) go so far as to say that "normal" eating in North American women is characterized by dieting. Similar to women with eating disorders, dieters are often preoccupied with their weight and dissatisfied with their bodies, with binge eating and self-induced vomiting possibly being present in extreme dieters (Polivy & Herman, 1987).

Given these similarities between normal dieters and individuals suffering from eating disorders, eating disorders may fall at the endpoint of a continuum of disordered eating, with chronic and intermediate dieters falling at intermediate points along the continuum (Striegel-Moore, Silberstein, & Rodin, 1986).

In support of the continuum hypothesis, Mintz and Betz (1988) found that the degree of disturbed eating in a sample of female undergraduate students was strongly related to lowered self-esteem, more negative body image, greater tendency to endorse sociocultural beliefs regarding the desirability of female thinness, obsessive thoughts concerning weight and appearance, and interference of weight and appearance concerns with other life domains. Subjects were placed into one of six eating disorder categories as operationalized by DSM-III-R criteria (APA, 1987). These categories included normals, bulimics, bingers, purgers, chronic dieters, and subthreshold bulimics (met some, but not all DSM-III-R criteria). Similarly, subjects were placed into one of six weight categories, with the anorexic and obese categories being excluded from further analyses due to the small number of subjects in these categories. Mintz and Betz (1988) found that in general the bulimia nervosa group was significantly different from all other groups, regardless of how the five other groups themselves differed from one another. For example, bulimics reported

more dissatisfaction with their bodies than did bingers, purgers, or subthreshold bulimics, who in turn reported more dissatisfaction than did normals. Similarly, bulimics reported lower self-esteem than bingers or subthreshold bulimics, who in turn reported lower self-esteem than normals. Likewise, the bulimics reported greater endorsement of sociocultural mores regarding thinness and attractiveness than any of the other five groups, and differed from the other five groups on the degree to which they (a) thought about their weight, (b) feared becoming fat, and (c) reported that weight negatively affected their feelings about self, sex, and enjoyment of social life. Based on these findings, "...it seems reasonable to conceive of bulimia nervosa as normative behavior taken to an extreme" (Mintz & Betz, 1988, p.469).

As mentioned previously, researchers have begun researching disordered eating within the "normal" population (Mintz & Betz, 1988; Polivy & Herman, 1987). Mintz and Betz (1988) found in their sample of 643 nonanorexic, nonobese subjects that 61% were classified as having some intermediate form of eating-behavior problem, such as chronic dieting, bingeing or purging alone, or subthreshold bulimia (Mintz & Betz, 1988). Similarly Polivy and Herman (1987) concluded that many normal eaters (i.e., dieters or restrained eaters) displayed characteristics of eating-disordered pathologies. However, as previously mentioned,

they suggested that there are two components to the pathology exhibited by patients with eating disorders. One component includes an intense concern with weight, appearance, body shape, and eating, while the second component consist of ego deficits and perceptual disturbances.

Klemchuk, Hutchinson, and Frank (1990) administered the Eating Disorder Inventory to three female undergraduate samples and found that very high rates of body dissatisfaction were reported. Similar to Polivy and Herman (1987), they identified two groups at risk for developing an eating disorder: a body dissatisfaction group and a binge-purge group with poor adjustment. On eight of twelve discriminating variables, mean scores were lowest (i.e., indicating less pathology) in the normal control group and showed an increase from this highly body-satisfied group (i.e., normal control) to the Body Dissatisfaction group to the Eating Disordered group, suggesting a progressive continuum of disordered eating. These eight variables included (a) bingeing behavior, (b) gorging when upset, (c) frequency of vomiting for weight control, (d) perfectionism, (e) number of hours per week spent alone in physical exercise, (f) maturity fears, (g) feelings of ineffectiveness, and (h) interpersonal distrust (Klemchuk, et al., 1990). Three additional variables, including current dieting, eating differently when alone than with

others present, and total number of hours of physical exercise per week, primarily discriminated the body-satisfied group and the other two groups, with more similar scores being obtained among the Body Dissatisfaction and Eating Disorder subjects. The Eating Disorder group showed significantly greater pathology on both cognitions and behaviors than the other two groups, and mainly differed from the body dissatisfaction group on (a) cognitions, (b) affects, and (c) attitudes, including feelings of ineffectiveness and guilt, perfectionism, and desired weight loss. The Body Dissatisfaction group, however, reported the highest negative attitudes towards themselves, while the major issues in the Eating Disorder group involved coping with stress, confusion regarding affect, feelings of helplessness and ineffectiveness, and low self-esteem (Klemchuk, et al., 1990). These findings lend further support to the two-component model of disordered eating described by Polivy and Herman (1987).

In addition to body image dissatisfaction, Striegel-Moore, McAvay, and Rodin (1986) found that "feeling fat" was related to disordered eating characteristics. They evaluated a variety of psychological variables related to body image and weight in two studies, including a sample of 46 female undergraduates and 72 female undergraduates, respectively. In the first study, they found that feeling fat was related to (a) being overweight, (b) setting higher

standards (i.e., greater perfectionism), (c) experiencing greater social pressure to be thin, (d) making social comparisons about weight to other women, and (e) binge eating and dieting. They found in the second study that feeling fat was significantly related to a tendency to eat in response to external stimuli and emotional stress, and to feeling strong urges to eat. Possibly, feeling fat may sensitize a woman to her appetite and hunger feelings and make her more likely to notice them (Polivy & Herman, 1987). Polivy and Herman (1987) concluded that current sociocultural pressures towards thinness may be creating problems for many women as those who feel fat report significantly more external (and internal) pressures to be thin.

Similar to Striegel-Moore and colleagues (1986), Radke-Sharpe, Whitney-Satiel, and Rodin (1990) found that women with the greatest distribution of fat in the hips and buttocks, relative to the abdomen and waist, reported more eating disordered behavior, and viewed being at the "right" weight as more central to their sense of self. On the other hand, Pyle, Neuman, Halvorson, and Mitchell (1991) found in 1836 female college students that fear of loss of control over eating is an important diagnostic criteria for differentiating between bulimic and nonbulimic women rather than fear of being fat. They found that 90% of the bulimic females and 71% of the nonbulimic females reported fear of

being fat, while 83% of the bulimic students as opposed to 6% of the nonbulimic students reported fear of loss of control over eating. These results suggest that fear of being fat may be common to bulimic and non-bulimic individuals, while fear of loss of control over eating may be specific to individuals with a bulimia.

Similar to Pyle and colleagues (1991), Kiemle, Slade, and Dewey (1987) found after interviewing 38 female college students that a "general dissatisfaction and lack of control" combined with "perfectionist tendencies" were more closely related to abnormal eating attitudes and behaviors than specific feelings of "body dissatisfaction." Based on these results, therefore, treatment approaches may need to focus on changing general maladaptive cognitions and teaching new coping strategies, as opposed to addressing specific feelings of body dissatisfaction.

Striegel-Moore, Silberstein, Frensch, and Rodin (1989) found that a worsening of disordered eating among college freshmen females was associated with increasingly dysphoric feelings about weight, decreased ratings of their attractiveness, high perceived stress, increased weight dissatisfaction, and increased ineffectiveness. Although there was a worsening of disordered eating (i.e., bingeing, purging, and dieting), there was virtually no change in the prevalence of DSM-III-R bulimia nervosa from baseline to follow-up with 3.8 percent of females and 0.2 percent of

males displaying clinical symptomatology (Striegel-Moore, et al., 1989). These findings suggest that there is a need to focus on diagnosing and treating subclinical eating disordered individuals (e.g., chronic dieters, bingeing without purging), specifically within the female college population.

Similar to Striegel-Moore and colleagues (1989), Thelen, Farmer, Mann, and Pruitt (1990) found in their sample of female college students that subclinical bulimics, as opposed to non-eating disordered and bulimic individuals, showed the greatest improvement over time in ratings of their relationships with men, and endorsed less bulimic symptomatology over time relative to bulimic individuals. Subjects who tested bulimic or normal at time one began to do so at time two (seven months later) and time three (twelve months later). Furthermore, negative correlations between bulimic measures of symptomatology (BULIT) and ratings of relationships with men were found (Thelen, et al., 1990). These researchers suggested that counselors need to assess severity of bulimic behavior and relationship issues to determine what should be the main focus of treatment as subclinical bulimic symptomatology may lessen if the treatment focuses mainly on improving relationships with men.

Currently, researchers appear to be leaning towards a continuum hypothesis of disordered eating, although there is

some debate over similarities in behavioral and cognitive characteristics between individuals with a diagnosable eating disorder (i.e., anorexia nervosa and bulimia nervosa) and individuals with disordered eating that do not meet diagnostic criteria (e.g., chronic dieters). Furthermore, researchers have begun focusing on identifying and treating individuals with subclinical eating disorders (e.g., chronic dieters) as there appears to be a majority of women who display disordered eating characteristics but do no meet diagnostic criteria. Future research should focus on identifying factors that are related to disordered eating characteristics within the "normal" female population (e.g., relationship issues) that may be helpful in developing treatment strategies and alternatives.

Sociocultural and Familial Influences

Some researchers have suggested that the eating disorders anorexia nervosa and bulimia occur predominantly among upper or middle SES females between the ages of 12 and 20 years (for review see Shisslak, Crago, Neal, & Swain, 1987), while others have found that these disorders are beginning to occur in lower SES groups, among women over 25, and among non Anglo/Caucasian individuals (Garfinkel & Garner, 1982, Silber, 1986). Most researchers have agreed, however, that these eating disorders are more common in women than men, with approximately 90% of anorexics and

bulimics being female (Druss & Henifin, 1979; Pope, Hudson, Yurgelon-Todd, & Hudson, 1984).

To explain these gender-based differences, researchers have argued that society's increasing emphasis on a thinner, more muscular physique for females, but not correspondingly for males, has placed women at greater risk for developing disordered eating (Garner & Garfinkel, 1978; Garner, Garfinkel, Schwartz, & Thompson, 1980; Morris, Cooper, & Cooper, 1989; Polivy & Herman, 1987; Silverstein, Perdue, Peterson, & Kelly, 1986; Striegel-Moore, Silberstein, & Rodin, 1986; Wiseman, Gray, Mosiman, & Ahrens, 1992). For example, Silverstein and colleagues (1986) found in a series of 4 studies that the current standard of attractiveness portrayed on television and in magazines is slimmer for women than for men, and that this female standard is slimmer now than it was in the past. In the first two studies, they demonstrated that the standard of bodily attractiveness presented on television and in popular magazines is slimmer and more oriented to dieting and staying in shape for women than it is for men. Similarly, in studies 3 and 4, they demonstrated that the standard of bodily attractiveness for women presented in two major magazines (i.e., Ladies Home Journal and Vogue) and in the movies is more noncurvaceous now than it has been since the 1930's. They concluded that the popularity of a thin standard of bodily attractiveness

for women may be related to the increasing prevalence of eating disorders.

In an investigation of the actual sizes of Playboy centerfolds and Miss America contestants from 1959 to 1978, Garner and colleagues (1980) found that the mean weight for these individuals was less than that for the corresponding population of women under 30 years. Specifically, they found that while Playboy centerfolds' bust and hip measurements had decreased, their waists had become larger with a corresponding increase in height, thus indicating a selection bias for more angular shapes. Similarly, there was an average decline in weight of .28 lb. per year for Miss America Pageant contestants, with Pageant winners since 1970 weighing significantly less than the contestants. Corresponding with this cultural shift towards a thinner ideal shape, the average female under 30 years of age became heavier from 1959 to 1978 due to improved nutrition. With this increase in the average weight of females under 30, there has been a concommitant increase in the number of dieting articles in six popular women's magazines (e.g., Vogue, Good Housekeeping, and Ladies Home Journal). This finding suggests that women were attempting to achieve the ideal, tubular shape of current symbols of "sexual attractiveness" (i.e., Playboy centerfolds and Miss America contestants). This attempt to achieve the ideal body shape, however, appears to be in direct opposition to general

weight increases for females under 30. In other words, as women have become larger and heavier, they have been confronted with an image of beauty which is diametrically opposed to their natural state. In striving to achieve this new "ideal" body shape as defined by societal standards, they concluded that women may turn to pathogenic eating patterns and weight control methods to overcome and change their bodies natural shapes (Garner et al., 1980).

Recently, Wiseman and colleagues (1992) extended the research of Garner et al. (1980) by examining the trends toward a thinner, ideal physique from 1979 to 1988. They found that Miss America contestants body size had continued to decrease between 1979 and 1988, while Playboy centerfolds had remained at a low level of body weight. Furthermore, Miss America contestants showed a decrease in hip size from 1979 to 1985. Over the 10 year period (1979-1988) 69% of the Playboy centerfolds and 60% of Miss America contestants had weights 15% or more below the expected weight for their height and age category as determined by the Society of Actuaries table. At the same time, Wiseman and colleagues (1992) reported a dramatic increase in the number of diet, exercise, and diet/exercise articles from 1959 to 1988 in six women's magazines (e.g., Vogue, Ladies Home Journal, and Good Housekeeping). They concluded that women's "ideal" body image has generally stabilized at 13 to 19% below expected weight (weights 15% or more below expected weight is a

criterion for DSM-III-R diagnosis of anorexia nervosa). They suggested that the relatively higher number of exercise as opposed to diet articles which have appeared in the last eight years has placed such an emphasis on exercise that individuals may be increasing their use of this less discernible method of purging, allowing some to suffer from bulimia nervosa without being readily diagnosed.

Morris, Cooper, and Cooper (1989) suggested that the findings regarding Playboy centerfolds and Miss America contestants represented the contemporary ideal of men and not necessarily that of women. To evaluate the contemporary female body shape, they investigated the shape of fashion models during 1967, 1970, 1973, 1981, 1983, 1985, and 1987. They found that the models had become taller, while waist had increased, and hips had remained unchanged. Thus, bust and hip sizes decreased relative to the increased waist size, producing a more tubular shape. Based on these findings, therefore, it appears that the contemporary ideal body shape for women appears to be represented by models, Playboy centerfolds, and Miss America Pageant contestants as all three are becoming thinner and more tubular in shape. Morris and colleagues (1989) concluded that if changes in the ideal body shape presented in fashion magazines is associated with a corresponding increase in dieting to alter body shape, this social change could be a factor in the increasing prevalence of eating disorders.

As the ideal female body shape has become thinner and more tubular, there appears to have been a corresponding increase in dieting among North American women (Polivy & Herman, 1987). Polivy and Herman (1987) concluded that normal eating is now characterized by dieting, and that many "normal" eaters (i.e., dieters or restrained eaters) display characteristics of eating-disorder pathologies (e.g., obsessive concern with weight and appearance, dissatisfaction with body shape). Similarly, in a sample of 50 bulimic patients, Lacey, Coker, and Birtchnell (1986) found that circumstances immediately preceding the onset of bulimic symptoms in 74% of the patients involved the inability to maintain a low carbohydrate diet, then carbohydrate craving, and eventually bingeing and purging.

Although the literature reviewed suggests that an increase in disordered eating has been preceded by an emphasis on achieving a thinner physique, there has been considerable debate over what factors differentiate those women who develop an eating disorder from those who do not. Striegel-Moore and colleagues (1986) suggested that various environments that emphasize the importance of maintaining a certain body shape and weight (e.g., dancers, models, actresses, athletes) may place women at greater risk for developing disordered eating. For example, Garner and Garfinkel (1978) compared Eating Attitude Test scores in 112 female professional dance students, 59 healthy university

students, and 33 anorexic patients. They found that 31 (28%) of the dance students scored within the symptomatic range for anorexia nervosa as opposed to 4 (7%) of the healthy university students. Of the dance students who scored in the symptomatic range, 6 (5%) were diagnosed with primary anorexia nervosa based on clinical interviews. Garner and Garfinkel (1978) concluded that individuals who choose to pursue careers that pay special attention to body shape may be at greatest risk for developing anorexia nervosa.

Similar to Garner and Garfinkel (1978), Hamilton, Brooks-Gunn, and Warren (1985) surveyed 66 female dancers who performed in national and regional classical ballet companies in America and Europe. Within the American companies, they found that none of the African-American dancers reported an eating disorder. On the other hand, of the 34 Caucasian dancers within the American companies, 5 (15%) of the dancers reported anorexia nervosa and 6 (18%) bulimia. Similarly, of the 13 Caucasians in the European dance ballet companies, 3 (23%) reported a history of anorexia nervosa, while 2 (29%) reported a history of bulimia. All instances of anorexia nervosa (22%) were found in the national companies, while bulimia was reported by approximately 20% of both the national and regional companies. The higher incidence of eating problems did not signify greater psychological problems or lower weight,

however, as individuals in the national company had more positive body images and were better adjusted than regional company members. Hamilton and colleagues (1985) concluded that standards set in the most competitive settings (e.g., more hours of exercise per week required in the national company) appear to play a part in the emergence of anoretic behavior, although this behavior may not be coupled with psychological problems.

Other researchers have attempted to differentiate between those women who develop an eating disorder and those who do not by examining why women strive for a thin, "ideal" physique (Silverstein, Perdue, Peterson, Vogel, & Fantini, 1986; Timko, Striegel-Moore, Silberstein, & Rodin, 1987). In a sample of 45 female undergraduate students, Timko and colleagues found that those women who felt that many roles (e.g., leader, social situations, and physically general appearance and attractiveness) were central to their sense of self were more likely to place greater importance on their own appearance, and these women reported more symptoms of disordered eating. Timko and colleagues (1987) concluded that women who are most likely to strive to achieve the "superwoman ideal" and evidence signs of disordered eating are those that maintain both masculine and feminine sex-role stereotypes, and aspire to an ideal that includes being (a) physically attractive, (b) interpersonally oriented, and (c) independent.

Silverstein and colleagues (1986) found that the standard of bodily attractiveness for women has historically become less curvaceous as the proportion of American women in working professions or graduating from college has increased. In a sample of 526 female college undergraduates, they found that those students who believed their fathers thought they were not intelligent tended to adhere to a slim standard of bodily attractiveness. Silverstein and colleagues (1986) noted that bodily curvaceousness was associated with femininity and femininity was associated with a lack of intelligence and professional incompetence. In conclusion, they suggested that women who are concerned about what other people think about their intelligence may tend to adhere to a slimmer or less curvaceous standard of bodily attractiveness.

Contrary to Silverstein and colleagues (1986), Squires and Kagan (1985) found in 162 college women that compulsive eaters tended to (a) perceive themselves as relatively low in feminine qualities and (b) desire to be more feminine. On the other hand, individuals who perceived themselves and preferred to be more feminine tended to diet. Squires and Kagan (1985) concluded that the more an individual needed social approval and conformed to society's feminine profile, the more likely she would be to diet.

Most researchers agree that societal's increasing emphasis on achieving a thinner, ideal body has been

paralleled by an increase in the prevalence of eating disorders. For example, Mintz and Betz (1988) acknowledged that bulimia nervosa was a normative behavior taken to an extreme as their data indicated that watching one's weight was the norm for college women. The exact reasons why some women develop an eating disorder and some do not, however, remains elusive. Possibly, individual differences in personality traits and characteristics may make some individuals more vulnerable or susceptible to developing an eating disorder than other individuals. Similarly, differences in subcultures among individuals may have an impact on how much these individuals endorse sociocultural beliefs about attractiveness (e.g., ballet dancers vs. non-athletic women).

Rather than focusing on societal's influence on the development of disordered eating, some researchers have focused on familial influences as playing a role in the development of eating disorders (Calam, Waller, Slade, & Newton, 1990; Harding & Lachenmeyer, 1986; Head & Williamson, 1990; Hudson, Harrison, Pope, Jonas, & Yurgelun-Todd, 1983; Kog & Vandereycken, 1985; Stern, Dixon, Jones, Lake, Nemzer, & Sansone, 1989; Strober & Humphrey, 1987; Strober, Lampert, Morrell, Burroughs, & Jacobs, 1990). For example, Stern and colleagues (1989) studied 114 young women utilizing DSM-III criteria: 20 with restricting anorexia nervosa (mean age = 19.4), 13 with bulimic anorexia nervosa

(mean age = 20.9), 24 with normal-weight bulimia (mean age = 24.4), and 57 non-eating disordered controls (mean age = 21.9). They gave the Family Environment Scale developed by Moos and Moos (1981) to each subject and one of her parents. They found that the eating disordered families rated themselves as being less supportive of each other, less encouraging of the open expression of feelings, and having more conflictual interactions than non-eating disordered control families. The parents, regardless of diagnosis, tended to view their families in a more positive light than their children. Furthermore, an analysis of variance demonstrated that the normal weight bulimic patients and their families were in general more achievement oriented than the restricting anorexic or bulimic anorexic patients and families. Stern and colleagues (1989) concluded that families with eating disordered patients were more dysfunctional although no causal relationship could be determined between family environment and development of disordered eating.

Head and Williamson (1990) investigated the relationship between family environment factors and symptoms of bulimia nervosa and secondary psychopathology in 58 women diagnosed with DSM-III-R bulimia nervosa. A factor analysis of the Family Environment Scale, the Eating Disorder Inventory, and the Million Clinical Multiaxial Inventory showed that a restrictive/conflictual family environment

with high parental control was associated directly with neuroticism and introversion but inversely related to bulimic/anorexic behaviors and cognitions. Head and Williamson (1990) suggested that the secondary psychopathology noted in bulimia (i.e., neuroticism and introversion) rather than the bulimic symptoms are associated with a dysfunctional family environment. They concluded that a dysfunctional family environment might be associated with general neurotic characteristics and personality disturbances, but a more specific learning history (e.g., being teased about being overweight) may be associated with eating disorder syndromes.

Similar to Head and Williamson's (1990) study evaluating bulimic patients family environments, Harding and Lachenmeyer (1986) investigated family interaction patterns as described by Minuchin, Rosman, and Baker (1978) in 30 female anoretics and 30 non eating disordered controls. Specifically, they investigated Minuchin's theory that anoretic patients report more family overprotection, enmeshment, rigidity, and less conflict resolution than non-eating disordered individuals. They failed to find any difference between the anoretic subjects and the control subjects on any of the family interactional patterns. They did find, however, that anoretic participants were significantly more external in their locus of control than were non-anoretic controls. This lends support to the

contention that anoretics maintain a sense of personal ineffectiveness about achieving control over events in the world around them (Harding & Lachenmeyer, 1986). Harding and Lachenmeyer (1986) concluded that the failure to find family variables as relating to anoretic symptomatology may have been related to their subjects inability to accurately recall family interaction patterns as the mean age of the anoretic group was 26 years, while the control groups mean age was 25 years.

Strober and Humphrey (1987) reviewed studies investigating familial contributions to the etiology and course of eating disorders (i.e., anorexia nervosa and bulimia). They concluded that most research described bulimics and bulimic anorexics and their parents as perceiving their family environments as more conflictual and disengaged and less cohesive and nurturant than normal control subjects. Furthermore, studies of family interactions suggested that bulimic and anorexic families are enmeshed , intrusive, hostile, and negating of the child's emotional needs. Strober and Humphrey (1987), indicated, however, that exactly how interactive patterns facilitate or potentiate weight concern and dieting behavior remains unexplained. They suggested that inadequate family environments (e.g., rejection, hostility, impulsivity, discord) may result in behavioral deficits in coping and feelings of being overwhelmed by painful and disruptive

affective states. These vulnerabilities, in the context of pressures to diet and to maintain a low body weight, may lead to periodic episodes of dysregulation (binge eating) followed by self-reproach and efforts to purge the ingested food (Strober & Humphrey, 1987).

Other researchers have focused on examining the occurrence of eating disorders and affective disorders in biological relatives (Hudson, Harrison, Pope, Jonas, & Yurgelun-Todd, 1983; Strober, Lampert, Morrell, Burroughs, & Jacobs, 1990). Hudson and colleagues (1983) evaluated the reported presence of a family history of psychiatric illness via DSM-III criteria in 420 first degree relatives of 14 patients with anorexia nervosa, 55 patients with bulimia, and 20 patients with both disorders. They found that the prevalence of familial affective disorder was greater in patients with anorexia nervosa and/or bulimia than in patients with schizophrenia or borderline personality disorder, but was similar to that found in patients with bipolar disorder. Hudson and colleagues (1983) concluded that anorexia nervosa and bulimia appear to be closely related to, and may be forms of, affective disorders.

Strober et al. (1990) investigated psychiatric illnesses in 280 individuals (referred to as probands), including 97 with anorexia nervosa, 66 with primary major affective disorder, and 117 with various nonaffective conditions referred to as mixed disorders (i.e.,

schizophrenia, conduct disorder, personality disorder, parent-child conflict). They found that anorexia nervosa is approximately eight times as common in female first-degree relatives of anorexic patients (probands) as in the general population, and is absent in relatives of probands with other types of deviance. Bulimia nervosa, on the other hand, did not seem to aggregate to the same degree, although there appeared to be an excess of bulimia nervosa among sisters of bulimic patients (probands) with the rate in sisters being four times that of the general population prevalence (Strober, et al., 1990). Furthermore, they found an excess of affective disorder (mainly unipolar type) among the relatives of anorexic probands, although the increased risk was accounted for largely by the subset of anorexics with coexisting depressive disorder. Unlike Hudson and colleagues (1983), Strober et al.(1990) found that the familial resemblance of anorexia nervosa was different from that operating in the transmission of affective disorder as only families of anorexic probands had increased loading for anorexia nervosa, whether or not their eating disorder occurred in conjunction with major depression. They concluded that at least some of the cases of anorexia nervosa arise from intergenerational familial transmission and suggested that certain family environments may reinforce pathological tendencies with certain predisposed individuals

responding differently to family environments that thwart the development of a firm sense of self.

Kog and Vandereycken (1985) reviewed family research regarding eating disorders and concluded that the majority of studies are clinically descriptive and do not utilize adequate control groups. They noted the need for systematic comparative studies of clinical characteristics, including (a) intergroup comparisons between an eating disorder group and normal controls and/or various psychiatric groups, and (b) intragroup comparisons between various eating disorder subgroups. Regardless of the methodology used, however, they acknowledged that anorectics and normal-weight bulimics seem to come from families of higher social class when compared with the general population and with other psychosomatic disorders. Furthermore, there appeared to be a higher incidence of weight problems in families of anorectics and normal-weight bulimics and serious physical illness in the family was common, especially for the bulimic anorectics and normal-weight bulimics. Incidences of affective disorder (depression) was significantly higher in eating disordered families than in the general population and other psychiatric groups, but comparable to the incidence in the major affective disorder group. Likewise, alcohol abuse, especially in the fathers, was the second most prevalent psychiatric illness, although a well-controlled comparison with a normal sample was not

available. Finally, with regard to family relationships, a pattern of control and interdependence seemed to emerge in eating disordered families (Kog & Vandereycken, 1985).

Although familial environments may contribute to the development of eating disorders, a causal pathway of influence cannot be determined as research in this area is mostly clinically descriptive or correlational in nature. In an effort to evaluate family environments in a controlled, empirical manner, Kog and Vandereycken (1985) suggested that future family research in the area of eating disorders should focus on (a) the relation between eating disorder and affective disorder in the family via longitudinal research, (b) the use of adoptive studies to determine genetic versus environmental influences, (c) the use of well-controlled between-group designs to evaluate differences in eating disorder subgroups, (d) the inclusion of all family members to investigate generational boundaries, and (e) the combination of observational and self-report methods to enable comparisons between the experiences of family members themselves and the perception of external observers. Possibly, by empirically investigating familial influences on the development of eating disorders, researchers may be able to identify those individuals who may be more susceptible to developing an eating disorder based on family dynamics and interactional patterns.

Exercise and the Eating Disorders

Paralleling an increase in the prevalence of eating disorders has been an increasing emphasis on becoming physically fit and thin (Brownell, 1991). Wiseman, Gray, Mosimann, and Ahrens (1992) found that the number of exercise articles in the last eight years has surpassed the number of diet articles. They suggested a new trend is emerging of exercise and fitness for weight loss in addition to or in place of dieting. Despite this increasing emphasis on thinness, however, excessive exercise and disordered eating has been poorly understood (Pasman & Thompson, 1988). With the inclusion of vigorous exercise as a method of purging in the DSM-III-R criteria for bulimia nervosa, however, there appears to be a connection between exercise and eating disorders.

According to some researchers, hyperactivity (or exercising) occurs as a secondary phenomenon to the primary disorder of anorexia nervosa (Bruch, 1965; Seaver & Binder, 1972). For example, Bruch (1965) acknowledged that overactivity (or exercising) appeared to be a secondary phenomenon of primary conceptual and perceptual disturbances in body awareness. Based on observations of 43 patients (37 females, 6 males) studied between 1942 and 1964, she concluded that drive for activity (or exercising) usually appeared before the noneating phase and continued until emaciation was far advanced. The crucial psychiatric point,

however, appeared to be a preoccupation with body size and a relentless pursuit of being thin (Bruch, 1965). Similarly, Seaver and Binder (1972) acknowledged that a striking characteristic of patients with anorexia nervosa was the tendency towards overactivity (or exercising) due to either a conscious voluntary effort to deny the enervating effect of drastic weight reduction or for psychological reasons (e.g., body image disturbances and feelings of ineffectiveness). They noted that anorexic patients were often "...given to dramatic exercises, prolonged walks, and a variety of sleep disturbances" (p.266).

Other researchers, however, have viewed exercise as primary to the eventual onset of disordered eating (Epling & Pierce, 1988; Epling, Pierce, & Stefan, 1983; Katz, 1986; Kron, Katz, Gorzynski, & Weiner, 1978). Kron and colleagues (1978) evaluated the nature and extent of physical activity in patients diagnosed with anorexia nervosa before, during, and after hospitalization to define the "core pathology" in anorexia nervosa. They found upon reviewing hospital records, that 25 of the 33 patients were "hyperactive" (i.e., exercised) immediately prior to, or during, hospitalization (i.e., during the acute excessive dieting and severe weight loss phase). The activity was usually goal-directed, organized, planned, and carried out alone in a tightly scheduled, rigid manner. The fact that hyperactivity was present in at least 21 of 33 patients

prior to their dieting, with 8 of 11 patients still being hyperactive after they regained weight to their premorbid level or at least 90% of their ideal weight, suggested that the increased physical activity is independent of weight loss. Kron and colleagues (1978) concluded that hyperactivity is a primary feature of anorexia nervosa and is one of the earliest signs to appear in the illness and one of the last to subside. Similarly, Katz (1986) reported the cases of two men who developed typical anorexia nervosa only after becoming serious long distance runners. Furthermore, both of these runners became depressed and bulimic following enforced reduction in their running. Katz (1986) concluded that extreme exercise can serve to trigger, and possibly sustain, an eating disorder.

Epling and colleagues (1983, 1988) viewed the presence of activity anorexia as a subset of the more general diagnostic category of anorexia nervosa. They hypothesized that strenuous locomotor activity works to suppress appetite which serves to affect food schedule and/or deprivation, leading to further activity. They suggested that self-imposed food restrictions, such as diets, could serve to generate a food schedule and level of deprivation sufficient to induce high-rate activity in humans. Epling et al. (1983) concluded that activity anorexia is most likely to occur in families, social groups, or organizations that encourage both high-rate activity and dieting practices.

They suggested that sociocultural factors set and maintain the conditions that produce activity anorexia (Epling et al., 1983).

Corresponding with Epling et al.'s (1983) emphasis on sociocultural factors as maintaining conditions that produce activity anorexia, some researchers have found that women in athletic environments requiring a slender, fit physique are more likely to suffer from an eating disorder or to demonstrate pathogenic weight control behaviors (Harris & Greco, 1990; Lundholm & Littrell, 1986; Rosen & Hough, 1988; Rosen, McKeag, Hough, & Curley, 1986). For example, Rosen and colleagues (1986) found in 182 female collegiate athletes that 32% reported utilizing at least one of the weight-control behaviors defined as pathogenic. These pathogenic weight-control behaviors included: (a) self-induced vomiting, (b) using laxatives to expel unwanted calories, or (c) regular use of diet pills or diuretics for the purpose of weight control. Individuals were classified as using a pathogenic weight-control technique if they admitted to using the technique daily for at least one month. Of the 30 athletes who completed the follow-up survey, 25 (83%) indicated that their concern about weight was primarily related to athletic performance rather than enhancing their appearance. Furthermore, Rosen and colleagues (1986) found that female athletes who tended to resort to hazardous weight-control techniques were those who

had perceived themselves as obese at one point in their life or had lost more weight than they originally intended. They concluded that although these athletes may not have an overt history of anorexia nervosa, they may "...likely be at risk for suffering from the sequelae of hypokalemia, hypoglycemia, or excessive adrenergic stimulation resulting in impaired strength, speed, endurance, and reflexes" (p. 86).

To address pathogenic weight-control in female collegiate athletes more specifically, Rosen and Hough (1988) studied the methods and extent to which female college gymnasts diet in 42 gymnasts who represented five teams in a major athletic conference. They found that all 42 gymnasts reported currently dieting with 26 of them using at least one form of pathogenic weight control behavior, including (a) self-induced vomiting, (b) use of laxatives or diuretics for weight loss, (c) regular use of diet pills, (d) fasting for more than one day, and/or (e) fluid restriction for at least one day per week. They recorded the gymnasts as using pathogenic weight-control behaviors if they had employed any of these techniques at least twice weekly over a period of three or more months within the previous year or engaged in fluid restriction at least once a week. Of the 28 gymnasts who were told by their coaches that they were too heavy, 21 resorted to using pathogenic weight-control behaviors. Rosen and Hough (1988) concluded

that female gymnasts whose coaches tell them they are too heavy may be more likely to utilize dangerous methods to resolve their perceived weight problems. They acknowledged that use of pathogenic weight-control behaviors "..can result in malnutrition, dehydration, loss of vital electrolytes, hypoglycemia, and excessive adrenergic stimulation.." and can eventually "..significantly decrease performance capabilities, heighten the risk of injury, and lead to death" (p.143).

Similar to Rosen and Hough (1988), Harris and Greco (1990) found in a study of 28 female gymnasts that they were extremely concerned about their weight. These gymnasts reported being dissatisfied with their bodies and eager to lose weight, weighed themselves frequently, thought about their weight a lot, and talked about it often. Furthermore, they found that these gymnasts reported using a variety of methods when trying to lose weight, including (a) going on a mild diet (75%) and increasing their level of exercise (71%), (b) going on a strict diet (43%), (c) fasting for at least a day (18%), and (d) taking laxatives (7%). Subjects reported dieting an average of 19 days in the past month, and 57% reported exercising more than 4 hours a day. Harris and Greco (1990), however, found that their subjects utilized dangerous forms of weight-control behavior less frequently than did gymnasts studied by Rosen and Hough (1988). Furthermore, they found that gymnasts' scores on

the EDI (Garner, et al., 1983) did not differ significantly from those of most adolescent girls, with scores on the EDI ineffectiveness scale being lower for the gymnasts than for the normative sample. Harris and Greco (1990) concluded that although competitive gymnasts are subject to intense pressures for thinness and are concerned about their weight, their concern may not reflect an eating disorder, but may mirror society's emphasis on achieving a thin physique.

Although researchers have agreed that female athletes often use pathogenic weight-control behaviors, their findings are equivocal regarding the incidence of eating disorders within this population. Rather than focusing on identifying individuals that meet a clinically diagnosed eating disorder (i.e., anorexia nervosa or bulimia nervosa), researchers might focus on identifying disordered eating behaviors which may be pathological but not diagnosable.

Unlike Harris and Greco's (1990) findings regarding female gymnasts, Lundholm and Littrell (1986) found in 751 female adolescent cheerleaders that the greater the desire for thinness, the more likely the tendency to report disordered eating and weight-control behaviors associated with bulimia (e.g., uncontrollable overeating followed by impulses to engage in self induced vomiting). They found that cheerleaders who scored in the upper third on the Desire for Thinness Scale which had been developed specifically for this study were more apt to report (a)

excessive concern with dieting, caloric restriction, and weight, (b) dissatisfaction with the size of parts of their body, (c) going off a diet when a "non-diet" food was eaten, and (d) episodes of uncontrollable overeating often followed by the impulse to engage in self-induced vomiting. Lundholm and Littrell (1986) concluded that some female adolescents will encounter cultural messages about the desirability of thinness and convert these messages into disordered eating behaviors, such as vomiting and rigid dieting.

In addition to investigating disordered eating and pathogenic weight-control behavior in female gymnasts and cheerleaders, researchers have assessed the relationship between eating disordered behaviors and obligatory running (i.e., running becomes a consuming goal that preempts all other interests in life)(Katz, 1986; Pasman & Thompson, 1988; Yates, Leehey, & Shisslak, 1983). For example, Pasman and Thompson (1988) evaluated body image and eating disturbance in obligatory runners (n = 30), obligatory weightlifters (n = 30), and sedentary controls (n = 30). They found that runners and weightlifters had greater eating disturbances than controls with females evidencing greater eating psychopathology than males. Although both exercise groups had higher levels of eating disturbance than controls, this was only for anorexic tendencies and not bulimic behaviors. Furthermore, females were more dissatisfied with their body than males, with the exception

that male and female weightlifters were equivalent on body dissatisfaction indices. Pasman and Thompson (1988) concluded that these findings partially supported the theorized similarity between obligatory runners and individuals with eating disorders and extended the formulation to include obligatory weightlifters.

Similar to Pasman and Thompson, Yates and colleagues (1983) found that male obligatory runners resembled anorexic women regarding family background, socioeconomic class, and personality characteristics, including: (a) inhibition of anger, (b) extraordinary high self-expectations, (c) tolerance of physical discomfort, (d) denial of potentially serious debility, and (e) a tendency toward depression. They concluded that both phenomena (i.e., obligatory running and anorexia nervosa) represented a partially successful, but potentially dangerous, attempt to establish an identity. Likewise, Katz (1986) reported that anorexia nervosa developed in two male long distance runners following a substantial increase in exercise level and weight loss logically consequent to this behavioral change. He found that the conscious preoccupation with diet and weight, and the morbid fear of becoming fat, evolved after increased physical activity and/or initial weight loss itself. Furthermore, Richert and Hummers (1986) found that jogging may be a preferred form of exercise for college students at possible risk for having an eating disorder. They found

that subjects with EAT scores at or above 30 showed a significantly higher mean number of hours of jogging per week and exercising alone than subjects with EAT scores less than 30. Richert and Hummer (1986) suggested that activity patterns may change over the course of the disorder, with jogging being preferred in the early stages of anorexia, and activity becoming more general in later phases.

Other researchers, however, have demonstrated that obligatory running is not analogous to anorexia nervosa and bulimia nervosa (Nudelman, Rosen, & Leitenberg, 1988; Owens & Slade, 1987; Weight & Noakes, 1987). Nudelman and colleagues (1988) compared 20 high intensity male runners with 20 sedentary-moderate exercising male controls and 20 women with bulimia nervosa. High-intensity male runners were identified as those individuals who worked out a minimum of 6 to 7 times a week for at least three months with each session lasting more than 40 minutes. They found that when compared with bulimia nervosa subjects, the male runners were not (a) anxious about eating, (b) overly preoccupied with food, (c) excessive in binge-eating or purging behavior, (d) negatively preoccupied with their weight, (e) intent on losing weight, (f) high on personality traits presumed to underlie eating disorders, or (g) depressed or low in self-esteem. Furthermore, they found that the male groups of high intensity runners and controls were not significantly different on any measure. Nudelman

and colleagues (1988) concluded that high-intensity male exercisers do not resemble females with eating disorders. They suggested that the differences between high-intensity male exercisers and females with an eating disorder may be due to different motivations for self-improvement. While compulsive exercise tendencies in males may be stimulated by athletic prowess, competition, and achievement, females who are obsessed with weight, dieting, and purging may be stimulated by a low self esteem (Nudelman, et al., 1988).

Like Nudelman et al. (1988), Weight and Noakes (1986) found that abnormal eating attitudes and the incidence of anorexia nervosa was no more common among competitive female runners than among the general population. They found that although 18 (14%) of the 125 female distance runners had EAT scores greater than 20, only 5 (4%) also had a history of amenorrhea and low body weight, and only one had a formal past history of anorexia nervosa (0.8%). Weight and Noakes (1986) concluded that some women with a psychological disposition towards anorexia nervosa may use running as a substitute for presenting the full-blown clinical features of anorexia nervosa. They suggested that "..such individuals may be at less risk for anorexia nervosa than non-running individuals with similar vulnerabilities" (p.216).

Similar to Weight and Noakes (1986), Owens and Slade (1987) found that although female marathon runners did

resemble anorexic patients in terms of perfectionism, they were more like normal groups with respect to general dissatisfaction in life (i.e., school, work, social). They concluded that runners may share the same high standards as the anorexic patients, but that these high standards are not associated with general dissatisfaction in life found in anorexic patients. Thus, although superficial similarities exist between anorexics and runners, these do no reflect similarities at a more fundamental, causal level (Owens & Slade, 1987).

Although researchers tend to agree that disordered eating behaviors are more prevalent in certain athletic environments, research investigating the relationship between exercise and eating disorders has yielded equivocal results. The difficulty in establishing a consistent exercise-eating disordered relationship may in part be due to researchers making comparisons between an exercise group (e.g., runner, gymnast) and an eating disorder group (e.g., anorexics). It may be more helpful to view exercise activity as occurring along a continuum as has been done recently with eating disorders. Specifically, Mintz and Betz (1988) found that degree of disturbed eating was strongly correlated with lowered self-esteem, more negative body image, greater tendency to endorse sociocultural beliefs regarding the desirability of female thinness, obsessive thoughts concerning weight and appearance, and

interference of weight and appearance concerns with other life domains (e.g., romantic relationships). Similarly, it may be useful to view exercise intensity as occurring along a continuum to investigate the relationship between amount of exercise and degree of disturbed eating. To address these methodological issues, this study operationalized exercise duration along a continuum and investigated the relationship of this factor to physical self-esteem, level of disordered eating, and endorsement of sociocultural mores regarding attractiveness. In addition, this study investigated the prevalence of bulimia nervosa in a sample of female college students. Specifically, it was expected that:

(a) Individuals in the heavy exercise group would display significantly higher disordered eating (higher total BULIT-R scores) and endorsement of sociocultural mores about attractiveness (higher total BAQ scores) than the other three groups

(b) Based on the literature, no hypothesis about the remaining three groups to disordered eating and endorsement of sociocultural mores about attractiveness was made

(c) Individuals in the none to light exercise group would have a significantly lower physical self esteem than the other three groups

(d) Based on the literature, no hypothesis was made regarding the relationship of individuals in the remaining three groups to physical self esteem.

# CHAPTER II

# METHOD

## Subjects

Participants were solicited from psychology and physical education racquetball classes at a large public University in the southwestern United States. Although 232 females initially participated, data from three subjects were discarded due to questionnaires being incomplete. The mean age of the 229 female students comprising the final sample was 21.73 years (*SD* = 4.49), with 221 (96.5%) being single. In terms of race ethnicity, 174 (76%) identified themselves as Caucasian, 26 (11.4%) as African-American, 16 (7%) as Hispanic, and 4 (1.7%) as Native American, 2 (0.9%) as Asian-American; the remaining seven subjects were of other various ethnicities. Although participation was voluntary, subjects received course credit from their instructors for the time spent on this research project.

## Instruments

*Exercise Categorization.* The American College of Sports Medicine (Blair, Gibbons, Painter, Rate, Taylor, & Will, 1986) defined exercise activity as, "Any activity that uses large muscle groups, can be maintained for a prolonged period, and is rhythmical and aerobic in nature (e.g.,

running-jogging, walking hiking, swimming, rope-skipping, aerobic dance)" (p. 31). This definition, in conjunction with recent research (Klesges, Mizes, & Klesges, 1987; Richert & Hummers, 1986), was used to operationalize exercise activity for the current investigation. To determine level of exercise duration, subject's reported the total number of hours they engaged in planned exercise activities during an average week. In addition to providing the number of exercise hours, subjects indicated the amount of time spent in any of the following activities: running/jogging, swimming, bicycling, exercise program/aerobics class, weight lifting, jazzercise, dancing/dance class, jumping rope, walking (hiking), universal gym (super circuit), calisthenics, exercycle, and competitive sports (e.g., basketball, tennis). In addition to providing information on exercise frequency, subjects indicated whether or not they typically engaged in the planned exercise activity alone (see Appendix A).

Based on the total number of hours spent exercising per week and in accordance with American College of Sports Medicine (ACSM) Guidelines (Blair, Gibbons, Painter, Rate, Taylor, & Will, 1986), participants were classified into four categories of exercise duration: none-to-light, moderate, slightly heavy, and heavy. The four exercise categories were defined as follows:

None to light 0 to 1 hours of exercise per week

| | |
|---|---|
| Moderate | 1.1 to 4 hours of exercise per week |
| Slightly heavy | 4.1 to 7 hours of exercise per week |
| Heavy | 7.1 or more hours of exercise per week |

Disordered Eating. The Bulimia Test-Revised (BULIT-R) was used to measure subjects' levels of disordered eating in this study. Based on DSM-III-R criteria for Bulimia Nervosa, the 36-item BULIT-R was developed to assess the clinical symptoms of Bulimia and provide a quantitative measure of disordered eating (Thelen, Farmer, Wonderlich, & Smith, 1991). Although only 28 of the 36 items on the BULIT-R are used in determining total score, all 36 items are presented in a five-point, Likert scale format with five points given for items answered in the extreme "bulimic" direction and one point for items answered in the extreme "normal" direction (Thelen et al., 1991). Total scores are obtained by summing across the 28 items, and range from 28 to 140.

Thelen and colleagues (1991) provided data supporting the BULIT-R's validity and stability over time. Test-retest reliability was found to be .95, while correlations of .85 and .99 were established between the BULIT-R and the Hawkins and Clement Binge Scale (Hawkins & Clements, 1980) and the BULIT (Smith & Thelen, 1984), respectively. In cross-validation studies with independent samples of control and bulimic subjects, BULIT-R scores were in line with independent clinical interviews, identifying sixteen of the

twenty clinically diagnosed Bulimics (Thelen, et al., 1991). For diagnosing individuals with Bulimia Nervosa, Thelen et al. (1991) indicated that a cut-off score of 104 should be used (see Appendix B).

Self-esteem in the physical domain. The Physical Self-Perception Profile (PSPP) is a 30-item questionnaire which was used to assess self-esteem in the physical domain (Fox & Corbin, 1989). The PSPP is based on a multidimensional theory of self-esteem, which conceptualizes physical self-esteem in a three tiered hierarchical model (see figure 1). Although not measured by the PSPP, global self-esteem represents the Apex level of the hierarchical model. Overall, Physical Self Worth (PSW) and four dimensions of physical self-concept, which are measured by the PSPP, represent the domain and subdomain levels, respectively. Developed using samples of male and female college students, the PSPP thus provides an overall measure of physical self-worth (PSW), as well as four independent measures of physical self-concept, including: perceived sports competence (Sport), perceived bodily attractiveness (Body), perceived physical strength and muscular development (Strength), and perceived level of physical conditioning and exercise (Condition) (Fox & Corbin, 1989). Each of the 30 items is presented in a double forced choice format. First, participants decided which one of two statements best describes them. Second, after selecting the most descriptive

statement, participants then indicated whether the statement was "sort of true" or "really true" for them. For example, on one item, participants choose between the two statements, "Some people feel that they are not very good when it comes to playing sports" but "Others feel that they are really good at just about every sport" (Fox & Corbin, 1989).

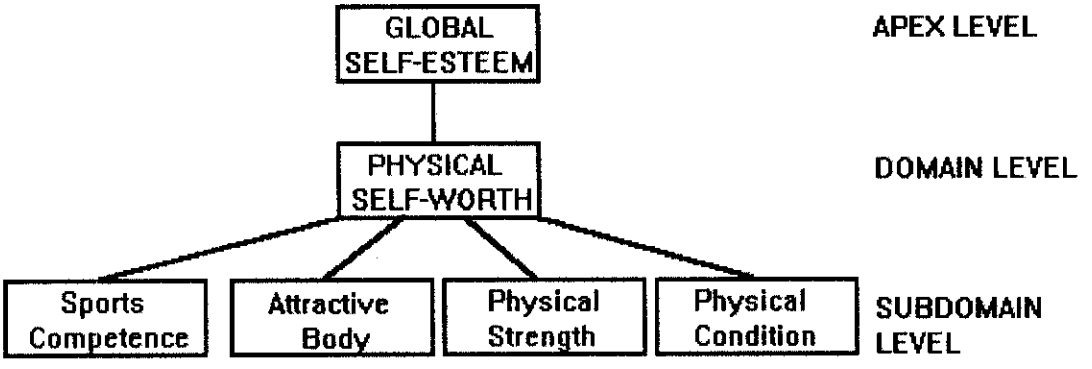


**Figure 1. Hypothesized three-tier hierarchical organization of self-perceptions. (Fox & Corbin, 1989)**

For the PSPP scales, test-retest reliability coefficients have ranged between .74 and .92, and .81 and .88, for a 16- and 23-day periods, respectively (Fox & Corbin, 1989). Corrected item-total correlations, which represents the contribution of each item to its scale total, were all above .5 and generally between .6 and .7 (Fox & Corbin, 1989). Factor analysis indicated that the four subdomain scales (Sport, Body, Strength, Condition), with the exception of two items, all loaded highest on their intended factor, with factor loadings greater than .5 for both males and females. The PSW scale exhibited the strongest association with global self-esteem, with correlations of .64 and .61 for females and males, respectively. Although not related to global self esteem, the four subdomain scales were correlated with the PSW scale, with coefficients ranging from .32 to .71, and .30 to .61, for females and males, respectively (Fox & Corbin, 1989).

Due to administrative difficulties, only the first 25 items of the PSPP were included in the current study. Each subscale in the PSPP consist of five items. As the excluded items (26 - 30) each corresponded to a different subscale of the PSPP, the mean score of each subscale was used when analyzing data as opposed to the total score for each subscale (see Appendix C).

Sociocultural mores regarding attractiveness

Endorsement of sociocultural mores regarding attractiveness was measured by the 12-item Beliefs About Attractiveness Questionnaire (BAQ) (Mintz and Betz, 1988; Striegel Moore, Silberstein, & Rodin, 1986). For each item, individuals responded to their beliefs about attractiveness on a 7-point, Likert scale, ranging from 1, strongly disagree, to 7, strongly agree. Items included, "Fat people are unhappy because of the way they look", and "Being attractive is more important for men than for women." A total score was obtained by (a) reversing the scoring of items 6 and 11, and then (b) summing across all the items. Thus, total scores can range from 12 (low endorsement of sociocultural mores regarding the importance of attractiveness) to 84 (high endorsement of sociocultural mores regarding the importance of attractiveness) (Mintz & Betz, 1988). Internal consistency reliability (Cronbach's alpha) for the BAQ in this sample was .70 (see Appendix D).

Demographic information. Subjects completed a Demographic and Exercise Questionnaire, providing the following information: age, marital status, year in school, racial/ethnic group, religious preference, present height and weight, ideal weight, hours of exercise per week, type of exercise activities engaged in per week, and if subjects participated in these activities alone.

## Procedure

Participants completed the Demographic Questionnaire, BULIT-R, BAQ, and PSPP in group sessions consisting of 3 to 50 subjects; approximately 30 minutes was required to complete the questionnaires. Prior to administering the questionnaires, participants completed a consent form which stated the purpose of the study and informed them that all information provided would be anonymous and confidential (see Appendix E). Because of the nature of this study and the importance of classifying participants into exercising categories, the demographic questionnaire was administered first. The remaining instruments were counterbalanced to control for ordering effects. Following completion of the questionnaires, subjects were provided with documentation to verify their participation so as to receive class credit.

Analysis of Data

First, participants' exercise categories were determined based on the information provided in the Demographic and Exercise Questionnaire. To determine the effects of level of exercise on disordered eating behavior, physical self-perception, and endorsement of sociocultural mores about attractiveness, a one-way multivariate analysis of variance was performed. Univariate analyses and Tukey post-hoc analyses were calculated to determine exactly where differences existed. To assess the reliability of the BAQ, the internal consistency (Cronbach's alpha) coefficient was determined. Alpha was set at .05 for all analyses.

# CHAPTER III

## RESULTS

To present the results in a cohesive and organized manner, this chapter has been divided into three broad sections: (a) descriptive and demographic data, (b) prevalence of bulimia nervosa, and (c) examination of dependent variables by exercise category. Although 232 subjects initially participated, three were later dropped from the study due to incomplete questionnaires. Thus, all subsequent statistical analyses were conducted with 229 subjects. For all analyses, alpha was set at .05.

### Descriptive and Demographic Data

Means, standard deviations, and ranges of the independent and dependent variables are presented in Table 1. On average, the women of this sample were almost 22 years old, weighed 132 lbs. and were about 65 inches in height. An examination of the variable weight difference (WTDIFF; difference between subject's reported ideal weight and their present weight) indicates that the participants were dissatisfied with their current weight, and wanted to be 11 pounds lighter on average. With respect to amount of exercise activity, participants exercised almost five hours

per week, with 69 (30.1%) subjects reporting that they engaged in this activity alone.

Regarding the number of years attending an institution of higher education, 51 (22.4%) attended for one year, 34 (14.9%) for two years, 46 (20.2%) for three years, 52 (22.8%) for four years, 27 (11.8%) for five years, and 18 (7.8%) for 6 or more years; the mean years for attending was 3.26 (SD = 2.27). With respect to academic rank, 62 (27.1%), 35 (15.3%), 57 (24.9%), and 69 (30.1%) of the students reported being freshmen, sophomores, juniors, or seniors, respectively. The remaining six students reported being in graduate school (n = 4, 1.7%) or in their fifth or higher year of undergraduate (n = 2, .9%). The participants reported cumulative GPAs ranging from less than 1.99 to 4.0, with 9 (3.9%) having a GPA of less than 1.99, 40 (17.5%) ranging from 2.0 to 2.49, 76 (33.2%) from 2.5 to 2.99, 59 (25.8%) from 3.0 to 3.49, and 45 (19.7%) from 3.5 to 4.0.

Pearson Product Moment Correlations were computed among the primary dependent variables to examine simple linear relationships and are presented in Table 2. A positive correlation was found between the BULIT-R and the BAQ, indicating that individuals who displayed bulimic symptomatology (i.e., higher BULIT-R scores) were more likely to endorse sociocultural mores about attractiveness. Similarly, the BULIT-R correlated significantly with all subscales of the PSPP except subscale 5. For example, an

inverse relationship existed between the BULIT-R and PSPP1 scale, suggesting that higher levels of bulimic symptomatology were associated with lower physical self-esteem. Likewise, an inverse relationship existed between the BULIT-R and the PSPP4 scale, suggesting that higher levels of bulimic symptomatology were associated with lower physical strength and muscular development. Regarding the PSPP, all subscales correlated with one another .34 or greater, except subscales PSPP2-PSPP4, and subscales PSPP4-PSPP5.

Subjects' expressed weight difference correlated significantly with the BULIT-R, the PSPP1, the PSPP3, and the PSPP4. Specifically, these correlations indicated that individuals who expressed a greater difference between their ideal and present weight evidenced (a) greater bulimic symptomatology ( i.e., higher BULIT-R scores), (b) lower physical self-esteem (i.e., lower PSPP1 scores), (c) the perception of their bodies as less attractive (i.e., lower PSPP3 scores), and (d) less physical strength and muscular development (i.e., lower PSPP4 scores).

Prevalence of Bulimia Nervosa

The participants' BULIT-R scores were used to assess the prevalence of bulimia nervosa. Based on the diagnostic criteria established by Thelen et al. (1991) (i.e., BULIT-R $\geq$ 104), 10 (4.3%) individuals were classified as bulimic.

Exercise Category Analyses

Individuals were classified into one of four exercise categories based on the number of hours they engaged in planned exercise activity per week. The four categories were:

(a) None to light 0 to 1 hours per week

(b) Moderate 1 .1 to 4 hours per week

(c) Slightly Heavy 4.1 to 7 hours per week

(d) Heavy 7.1 or more hours per week

First, chi square analyses were performed to determine if any relationships existed between exercise duration and exercising alone or reported GPA. These analyses revealed no differences among exercise groups regarding (a) their preference to exercise alone or with someone else (chi square(3) = 2.55, $p$ = .47), or (b) their reported grade point average (chi square(12) = 11.45, $p$ = .49).

Table 1

Means and Standard Deviations for Independent and Dependent Variables (N = 229)

| Variables | M | SD | Range |
|---|---|---|---|
| Age | 21.73 | 4.49 | 17.0 - 45.0 |
| Height | 64.80 | 3.51 | 36.5 - 77.5 |
| Weight | 132.63 | 23.30 | 90.0 - 225.0 |
| WTDIFF | -11.36 | 15.81 | -90.0 - 41.0 |
| Hours Exercised | 4.75 | 3.56 | 0.0 - 17.5 |
| BULIT-R | 54.06 | 21.29 | 28.0 - 132.0 |
| BAQ | 50.13 | 9.40 | 32.0 - 96.0 |
| PSPP1 | 2.39 | .67 | 1.0 - 4.0 |
| PSPP2 | 2.23 | .72 | 1.0 - 4.0 |
| PSPP3 | 2.40 | .66 | 1.0 - 4.0 |
| PSPP4 | 2.31 | .76 | 1.0 - 4.0 |
| PSPP5 | 2.47 | .66 | 1.0 - 4.0 |

Note. WTDIFF = difference between subjects' ideal and reported weights. BULIT-R = bulimic symptomatology. BAQ = endorsement of sociocultural beliefs about attractiveness. PSPP1 = physical self-worth. PSPP2 = perceived sports competence. PSPP3 = perceived bodily attractiveness. PSPP4 = perceived physical strength and muscular development. PSPP5 = perceived level of physical condition.

Table 2

Correlations Among Dependent Variables

| | BULIT-R | BAQ | PSPP1 | PSPP2 | PSPP3 | PSPP4 | PSPP5 |
|---|---|---|---|---|---|---|---|
| BULIT-R | 1.0 | | | | | | |
| BAQ | .34[B] | 1.0 | | | | | |
| PSPP1 | -.53[B] | -.37[C] | 1.0 | | | | |
| PSPP2 | -.20[B] | -.21[B] | .46[C] | 1.0 | | | |
| PSPP3 | -.17[A] | -.13[A] | .55[C] | .59[C] | 1.0 | | |
| PSPP4 | -.57[C] | -.28 | .75[C] | .22[B] | .40[C] | 1.0 | |
| PSPP5 | -.07 | -.03 | .34C | .49[C] | .47[C] | .17[A] | 1.0 |
| WTDIFF | -.29[C] | -.13 | .39[C] | .06 | .27[C] | .56[C] | .05 |

Note. WTDIFF = the difference between subjects' ideal weight and their reported present weight. BULIT-R = level of bulimic symptomatology. BAQ = degree of endorsement of sociocultural beliefs about attractiveness. PSPP1 = physical self worth. PSPP2 = perceived sports competence. PSPP3 = perceived bodily attractiveness. PSPP4 = perceived physical strength and muscular development. PSPP5 = perceived level of physical condition.

[A] = $p<.05$ [B] = $p<.001$ [C] = $p<.0001$

Second, a one-way multivariate analysis of variance (MANOVA) was conducted to determine if differences existed among categories with respect to height, weight, age, weight difference, disordered eating behavior (i.e., BULIT-R scores), physical self perception (i.e., PSPP scores), and endorsement of sociocultural mores about attractiveness (i.e., BAQ scores). As this analysis reached significance, $F(33, 631) = 3.88$, $p<.0001$, univariate ANOVAS were conducted (see Table 3). These analyses revealed no significant differences on age, $F(3, 224) = 1.40$, NS, height, $F(3, 224) = .42$, NS, weight, $F(3, 224) = .71$, NS, weight difference, $F(3, 224) = .20$, NS, disordered eating, $F(3, 224) = .46$, NS, and endorsement of sociocultural beliefs about attractiveness, $F(3, 224) = .49$, NS. In other words, the amount of time participants reported exercising was not related to their age, height, present weight, difference between their ideal and present weight (weight difference), disordered eating symptomatology, or beliefs about attractiveness. Significant differences, however, were found among the exercise groups on the PSPP2, $F(3, 224) = 11.60$, $p<.0001$, the PSPP3, $F(3, 224) = 25.89$, $p<.0001$, and the PSPP5, $F(3, 224) = 8.12$, $p<.0001$. Subsequent Tukey post-hoc analyses demonstrated that exercise group 4 ($M = 2.73$) was higher than exercise group 3 ($M = 2.32$) which in turn was higher than exercise group 2 and 1 in terms of perceived sports competence (PSPP2); exercise groups 2 and 1

did not differ from each other. Specifically, this finding suggests that higher levels of exercise were associated with greater perceptions of being competent in sports (see Figure 2).

In terms of bodily attractiveness (PSPP3), although groups 4 ($\underline{M}$ = 2.87) and 3 ($\underline{M}$ = 2.66) did not differ from each other, their mean scores were higher than groups 2 ($\underline{M}$ = 2.24) and 1 ($\underline{M}$ = 1.85). Likewise, group 2 had a higher mean score than group 1. This finding suggests that individuals who exercise 4.1 hours or more per week view their bodies as being more attractive than those who exercise less than 4.1 hours per week (see Figure 3).

Finally, group 4 ($\underline{M}$ = 2.89) was higher than the other three exercise groups on perceived level of physical condition (PSPP5). No differences were found, however, between exercise groups 3, 2, or 1 on the PSPP5. Specifically, this finding indicates that individuals who exercise 7.1 hours or more per week perceive themselves as being in better physical condition than those who reported exercising less than 7.1 hours per week (see Figure 4).

As no differences were found among exercise groups on disordered eating, a more in depth post hoc analysis was conducted to see if individuals in the different exercise groups were using different purging techniques to control their weight. Specifically, the purging behaviors analyzed included vigorous exercise, dieting, laxative abuse, use of

diuretics, fasting, and suppository use. As the multivariate analysis of variance reached significance, $F(24, 633) = 3.98$, $p<.0001$, subsequent univariate analyses were conducted. These analyses revealed no significant differences across exercise groups in terms of weight control behavior except on the amount of exercise they engaged in to burn calories, $F(3, 225) = 30.73$, $p<.0001$, and the amount of vigorous exercise they reported, $F(3, 225) = 11.06$, $p<.0001$. Tukey post hoc analyses demonstrated that all exercise groups differed in the expected direction on amount of exercise they engaged in with group 4 ($M = 2.78$) reporting a greater amount of exercise than group 3 ($M = 2.15$) who in turn reported exercising more than group 2 ($M = 1.64$). Likewise, group 2 acknowledged exercising more than group 1 ($M = 1.17$). Similarly groups 4 ($M = 1.70$) and 3 ($M = 1.48$) reported engaging in a greater amount of vigorous exercise than groups 2 ($M = 1.06$) and 1 ($M = 1.06$).

Table 3

Mean Values of Dependent Variables by Exercise Group

| | Exercise Group | | | |
|---|---|---|---|---|
| Variables | 1 | 2 | 3 | 4 |
| BULIT-R | 52.03 | 53.27 | 56.69 | 53.51 |
| BAQ | 50.22 | 50.11 | 51.01 | 48.69 |
| PSPP1 | 2.37 | 2.33 | 2.45 | 2.50 |
| PSPP2 | $1.87^{A}$ | $2.10^{B}$ | $2.32^{B}$ | $2.73^{C}$ |
| PSPP3 | $1.85^{A}$ | $2.24^{B}$ | $2.66^{C}$ | $2.87^{C}$ |
| PSPP4 | 2.29 | 2.28 | 2.38 | 2.30 |
| PSPP5 | $2.36^{A}$ | $2.32^{A}$ | $2.50^{A}$ | $2.89^{B}$ |
| WTDIFF | -10.33 | -12.21 | -11.45 | -10.20 |
| Height | 64.77 | 64.52 | 65.07 | 65.12 |
| Weight | 132.02 | 131.36 | 131.73 | 137.56 |
| Age | 22.00 | 22.31 | 21.39 | 20.66 |

Note. BULIT-R = bulimic symptomatology. BAQ = endorsement of sociocultural beliefs about attractiveness. WTDIFF = difference between subjects' ideal weight and reported weight. PSPP1 = physical self-worth. PSPP2 = perceived sports competence. PSPP3 = perceived bodily attractiveness. PSPP4 = perceived physical strength and muscular development. PSPP5 = perceived level of physical condition. $^{ABC}$ indicate significant differences in means.

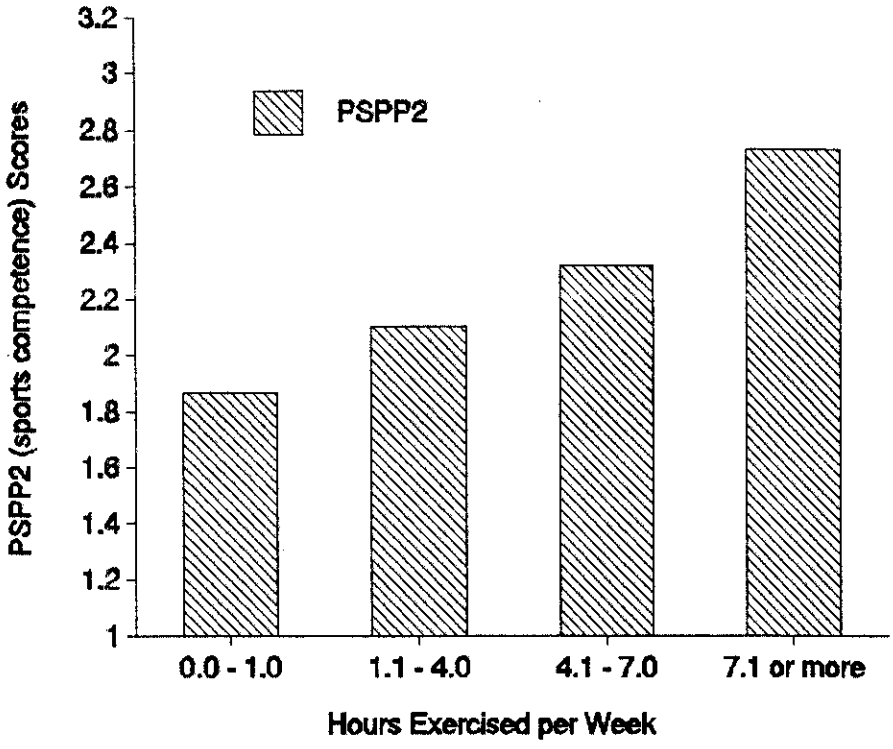


Figure 2. Scores on PSPP2 as a function of exercise group

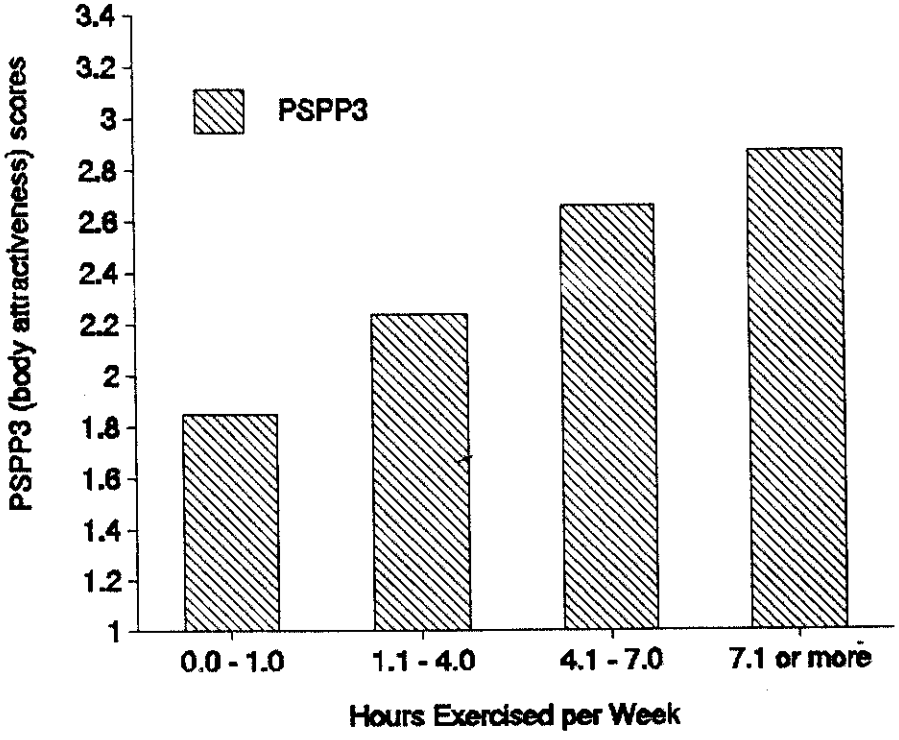


Figure 3. Scores on PSPP3 as a function of exercise group

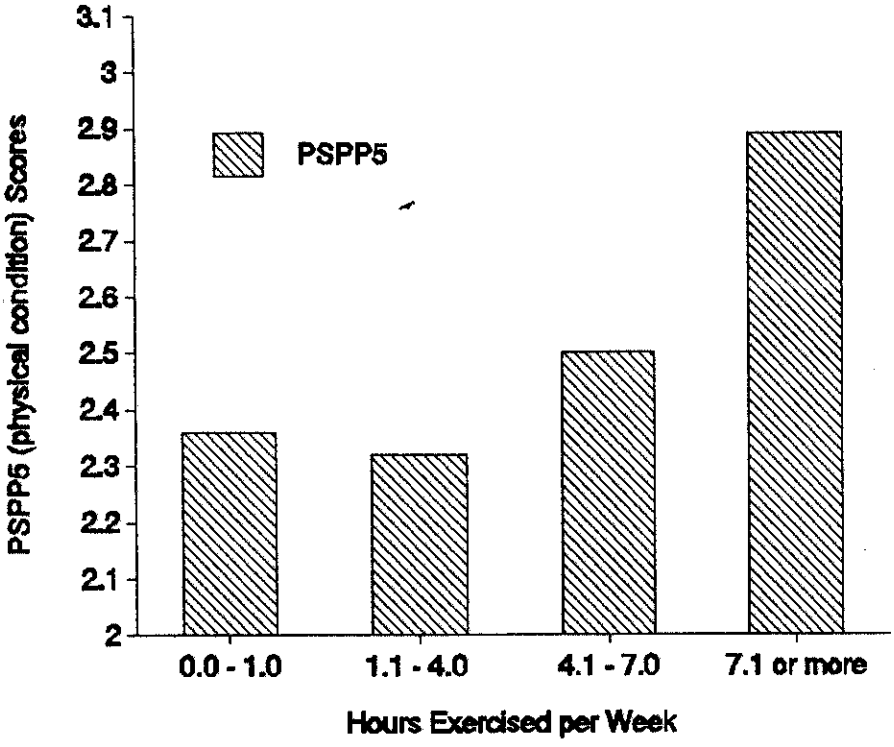


Figure 4. Scores on PSPP5 as a function of exercise group

# CHAPTER IV

# DISCUSSION

This study investigated the relationship of exercise duration to disordered eating, physical self esteem, and beliefs about attractiveness. To allow an in depth discussion of all major findings, this chapter will be divided into six categories: (a) correlates of exercise, (b) prevalence and correlates of bulimia nervosa and weight differences, (c) research limitations (d) counseling implications, (e) directions for future research, and (f) summary.

## Correlates of Exercise

The primary purpose of this study was to investigate the relationship of exercise duration to disordered eating, physical self-esteem, and beliefs about attractiveness. Specifically, female participants were classified into one of four exercise categories based upon the average number of hours they reported engaging in planned exercise in a given week. These categories were none-to-light (0.0 to 1.0 hours), moderate (1.1 to 4.0 hours), slightly heavy (4.1 to 7.0 hours), and heavy (7.1 or more hours). Among these four exercise groups, there were no differences on BULIT-R scores, indicating that there was no relationship between

exercise duration and bulimic symptomatology. The fact that no relationship emerged between exercise and the BULIT-R is inconsistent with previous research. Richert and Hummers (1986) found that college students with EAT scores at or above 30 showed a significantly higher mean number of hours of jogging per week and exercising alone than subjects with EAT scores less than 30. Similarly, Pasman and Thompson (1988) found that obligatory runners and weightlifters had greater eating disturbances than sedentary controls, while Wiseman et al. (1992) suggested that exercise may be a hidden purge for individuals suffering from eating disorders.

Several explanations exist for the failure to uncover a relationship between exercise duration and disordered eating. Although women may be exercising more, it may take time for this increase in exercise to manifest itself into disordered eating attitudes and behaviors, and then only upon concurrent restriction of food. Epling and colleagues (1983, 1988) hypothesized that strenuous locomotor activity (i.e., exercise) works to suppress appetite which serves to effect food schedule and/or deprivation, leading to further activity. They suggested that self-imposed food restrictions, such as diets, could serve to generate a food schedule and level of deprivation sufficient to induce high-rate activity (i.e., exercise) in humans which may eventually lead to what they called "activity anorexia."

Although Epling and colleagues (1983, 1988) theoretical model was specifically related to the genesis of "activity anorexia", it may be helpful in explaining the etiology of other eating disorders, such as bulimia nervosa, where exercise and strict dieting/fasting are used as pathological weight loss methods. For example, in the current study, while some women engaged in high levels of activity (i.e., exercise), they may have only recently started exercising, or for those who had been exercising long enough to have experienced appetite suppression, they may not have concurrently restricted food intake. In either condition, Epling and colleagues' (1983, 1988) model suggests that the women would not be likely to develop either activity anorexia or other disordered eating behaviors. As historical information concerning exercise and dieting/eating patterns were not obtained, this explanation is speculative, and in need of empirical research for verification.

A second explanation may be that exercise duration is not related directly to disordered eating symptomatology, per se, but with personality characteristics that have been related to disordered eating (e.g., perfectionism, addictiveness). That is, personality characteristics may mediate the effects of exercise. It may be that exercise alone does not lead to disordered eating, rather exercise in conjunction with certain personality characteristics

increases individuals risk for developing an eating disorder. Davis (1990) classified 96 women as either exercisers (i.e., individuals engaging in physical activity a minimum of 3 thirty minute sessions a week) or non exercisers and found that perfectionism was higher in those women who regularly exercised, particularly in those who also evidenced an addictive personality trait. In addition, these perfectionistic, addictive women placed greater importance on their appearance than did non-exercisers. As personality characteristics that may mediate the exercise disordered eating relationship were not obtained in this investigation, additional research will need to be conducted to determine the validity of this explanation.

A third possibility may be that exercise intensity or type of exercise are more important in understanding the relationship between exercise and disordered eating than how long an individual actually exercises. Individuals who report exercising the same number of hours per week likely differ in their level of physical exertion during each session (e.g., running eight vs. ten minute miles), and it is those exercising more intensely who may be at greater risk for developing disordered eating attitudes or behaviors. Also, people generally differ in the types of exercise (e.g., aerobics, running, basketball) in which they participate, and it may be that disordered eating is more prevalent in certain sport environments or activities (e.g.,

eating disordered individuals might engage in running while non-eating disordered individuals may play team sports)(e.g., Borgen & Corbin, 1987; Davis & Cowles, 1989). For example, Davis and Cowles (1989) examined concerns about weight and diet and appearance, and certain personality variables (i.e., extraversion-introversion, neuroticism-stability) in three groups of women: a control group of college students not engaged in sports beyond the recreational level, a group of high performance athletes in sports where a thin body build is advantageous (i.e., gymnastics, synchronized swimming, diving, figure skating, long-distance running, and ballet), and a similar group of athletes in sports where a thin build does not provide an advantage (i.e., field hockey, basketball, sprinting, downhill skiing, and volleyball). They found that thin build athletes were less extraverted and stable and reported (a) lower emotional well-being, (b) greater weight concerns, (c) more body dissatisfaction, and (d) more assiduous dieting than athletes whose sports did not emphasize leanness. In general, the thin build athlete group differed from the control group only in their reporting of fewer menstrual cycles and their thinner build. Furthermore, even though the mean body mass index for the thin athletes was within the range associated with health risks caused by being too lean, a large proportion of them were not satisfied with their appearance and indicated a desire to

lose weight. Davis and Cowles (1989) concluded that strenuous exercise may increase the likelihood of developing an eating pathology among female athletes whose sport demands a thin body build. In the present study, however, neither exercise intensity nor type of activity were accurately measured so no definitive statements concerning their potential influences can be made. Thus, additional research is needed to determine if exercise intensity or type of exercise is related to the prevalence of eating disorders and their correlates.

Similar to the BULIT-R, there were no significant differences among the four exercise groups on the BAQ. In other words, participants' endorsement of sociocultural beliefs about attractiveness was not related to how often they exercised in a given week. This finding indicates that women who exercise may not necessarily be motivated solely to achieve society's ideal, thin physique as suggested by other researchers (e.g., Wiseman, et al., 1992). Rather, individuals may be exercising because they are becoming more health conscious (Niknian, Lefebvre, & Carleton, 1991) and are motivated by a desire to become more physically fit. In a study assessing awareness and behavior related to cardiovascular disease prevention in the general population, Niknian et al. (1991) found that important secular changes were occurring in cardiovascular health-awareness knowledge and behavior which suggested that individuals were becoming

more health conscious. Thus, the women in the current study may have been motivated to exercise for health reasons as opposed to simply striving to achieve society's ideal thin physique, a pathological motivation which has been related to eating disorder attitudes and behaviors.

In addition to the BAQ, no differences were uncovered among the exercise groups regarding their expressed weight difference (i.e., the difference between participants' ideal weight and present weight). In other words, participants wanted to be thinner regardless of the amount of exercise they engaged in per week. As all women are exposed to a social environment that tells them they need to weigh less (Polivy & Herman, 1987; Striegel-Moore et al., 1986; Wiseman et al., 1992), it is not surprising that, on average, the participants in this study wanted to weigh over 11 pounds fewer than they currently did. The fact that exercise was unrelated to weight difference suggests that the length of time a woman exercises does not moderate the negative influence of the social environment. That is, exercise does not lessen or exacerbate the effects of society, leaving all the women in the study at equal risk for dissatisfaction with their current body weight.

Differences among the exercise groups, however, were found on the measure of physical self-esteem, specifically for subscales 2, 3, and 5. As the exercise groups did not differ in terms of weight, height, age, or whether they

exercised alone, it is likely that the differences in PSPP scores were due to the amount of time the individuals exercised and their self-perceptions resulting from that exercise, and not a result of natural physical differences.

Regarding differences on the PSPP2 subscale, individuals who exercised 4.1 hours or more per week perceived themselves as more competent in sports than those who exercised fewer hours. Similarly, Fox and Corbin (1989) found that the PSPP2 was one of three PSPP scores which discriminated between active and nonactive females. Specifically, they used structure coefficient scores to interpret the composition of this discriminant analysis with scores of .3 or more being regarded as meaningful. In regards to the PSPP2, they found a coefficient of .362 indicating that the PSPP2 scale was able to discriminate between active and nonactive females.

The present finding is consistent with other research regarding the effects of physical fitness on self and body attitudes (Collingwood, 1972; Collingwood & Willet, 1971). For example, Collingwood (1972) found in male rehabilitation clients that participants engaging in standard rehabilitation services in conjunction with physical training were more competent in sports than individuals engaging in standard rehabilitation services without physical training. Collingwood indicated that the more positive performance of the experimental group was a result

of the physical training and acknowledged that improved self-attitudes could "..serve as a springboard for gains in other areas" (p. 585). In the current study, it is likely that individuals who exercised more reported feeling more competent about themselves in sports because they had practiced or engaged in the physical activity more often. That is, the more someone does something (in this case, engage in sport/exercise activity) the more likely they are going to feel competent in their abilities to engage in the activity.

Regarding differences among the exercise groups on the PSPP3 scale, individuals who reported exercising for longer durations were more likely to perceive their bodies as more attractive (i.e., higher PSPP3 scores) than those who exercised less. Specifically, individuals who exercised 4.1 hours or more per week perceived their bodies as more attractive than the other participants. Similarly, individuals who exercised 1.1 to 4 hours per week perceived their bodies as more attractive than those who exercised 1.0 hours or less per week. Collingwood (1972) found similar results regarding the effects of physical training upon self attitudes and behaviors. He administered physical fitness test and body attitudes to 25 matched pairs of male rehabilitation clients ($N$ = 50). Participants were matched in terms of behavioral and emotional difficulties and need for physical training program. While the control group

received standard rehabilitation facility services, the experimental subjects received the same services plus a physical training program (i.e., training 5 days a week lasting one hour a day for 4 weeks). He found that participants in the experimental group demonstrated greater increases than the control group in (a) physical fitness performance, (b) body attitude, (c) positive self-attitude, (d) self-acceptance, and (e) positive physical, intellectual and emotional interpersonal behaviors.

It thus appears that individuals who engage in regular planned exercise activity are likely to perceive their bodies as more attractive and, in this respect, do not resemble individuals with a diagnosable eating disorder. Mintz and Betz (1988) found that the degree of disturbed eating in a sample of female undergraduate students was strongly related to a more negative body image, with a higher level of eating pathology related to a more negative body image. Similarly, Striegel-Moore, Silberstein, Frensch, and Rodin (1989) found that a worsening of disordered eating among college freshmen females was associated with decreased ratings of their attractiveness. Based on the results of these studies, therefore, individuals who report exercising more may actually be at less risk of developing disordered eating than low exercisers since they are likely to perceive their bodies as

more attractive. Before such a statement can be made definitively, however, additional research is needed.

The relationship between exercise and the PSPP5 indicated that individuals who exercised 7.1 hours or more per week were more likely to believe they were in better physical condition (i.e., higher PSPP5 scores) than those who exercised less than 7.1 hours per week. Similar findings regarding improvement in physical condition as a result of exercising have been reported by other researchers as well (Folkins, 1976; Gebhardt & Crump, 1990). Specifically, Folkins (1976) compared 36 adult men at high risk of coronary artery disease on improvements in physical and psychological fitness. Participants were assigned to either an exercise (i.e., exercise 3 times a week for 12 consecutive weeks) or a no exercise (control) group, with all subjects being instructed to avoid changes in diet, smoking, or special treatment of hypertension. Folkins found that exercise training led to significant improvement in physical fitness and significant decreases in anxiety and depression in the exercise group. Similarly, Gebhardt and Crump (1990) reviewed literature on worksite fitness and health promotion programs and concluded that fitness and wellness programs resulted in increased levels of fitness and a reduction in the risk factors for coronary heart disease. It appears, therefore, that exercising is related to improved physical condition, which in turn has been

associated with a reduction in risk factors associated with heart disease.

No differences were found among the four exercise groups regarding physical self worth (PSPP1 scores) or perceived physical strength and muscular development (PSPP4 scores). In other words, participants' physical self-worth and perceived physical strength and muscular development did not differ as a result of the number of hours they engaged in planned exercise activity per week. The failure to find differences among the four exercise groups on physical self-worth could be related to Fox and Corbin's (1989) conceptualization of the physical self-worth scale as a superordinate construct among the five PSPP subscales. They indicated that although this scale exhibited the strongest association with global self-esteem, it was not strongly related to degree of involvement in physical activity. Similarly, Fox and Corbin (1989) found that physical strength and muscular development (PSPP4 scores) were more predictive of male physical activity involvement than female physical activity involvement. Thus, the failure to find differences in perceived physical strength and muscular development among participants as a function of exercise duration may be related to the inclusion of only female subjects in the present sample. Furthermore, differences in perceived physical strength and muscular development may not have been uncovered because reported exercise was not

separated into specific types of exercise (e.g., runners vs. weightlifters). That is, if only weight lifters had been employed in the current study (an activity which would likely be related to perceived strength and muscular development), one might expect to find a positive relationship between exercise duration and the PSPP4.

In the present study, enhanced levels of certain dimensions of physical self-esteem appeared to be related to higher levels of exercise duration. Specifically, individuals engaging in greater number of hours of exercise activity per week reported feeling more competent about themselves in sports, viewing their bodies as more attractive, and feeling that they were in better physical condition than other participants. In addition, there was not a corresponding increase in eating pathology in individuals as a result of the number of hours exercised per week. Thus, it appears that individuals engaging in exercise activity may actually feel better about themselves in certain ways as a result of this activity.

Prevalence of Bulimia Nervosa

A second purpose of this study was to determine the prevalence and correlates of bulimia nervosa in a sample of female college students. Using the diagnostic criteria previously established (i.e., BULIT-R $\geq$ 104), 4.3% ($n$ = 10) of the 229 participants were identified as having bulimia nervosa. When a less stringent BULIT-R cut-off score was

employed (i.e., 85), 25 (10.9%) could be classified as bulimic. To verify a bulimia nervosa diagnosis, Thelen et al. (1991) suggested that researchers use follow-up interviews whenever possible regardless of the cut-off score employed. As no clinical interviews were used in the current investigation, the exact number of individuals meeting DSM-III-R criteria for bulimia nervosa can not be determined. The 4.3% incidence of bulimia nervosa found in the current study, however, is consistent with previous research which has reported similar prevalence rates for this disorder (Jones, 1989; Katzman, Wolchik, & Braver, 1984; Mintz & Betz, 1988; Pyle, Halvorsen, Neuman, & Mitchell, 1986; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). In their study of female undergraduates, Mintz and Betz (1988) classified 3% of their sample as bulimic based on DSM-III-R criteria. In an earlier study with female undergraduates, Katzman et al. (1984) found a 3.9% prevalence rate using DSM-III criteria for bulimia.In a longitudinal investigation, Pyle and his colleagues (1991) found that 43 (4.7%) freshmen females met operationalized criteria for having an eating disorder diagnosis. Of these 43 females, 22 (2.4%) met DSM-III criteria for bulimia, 17 (1.8%) reported bulimia with weekly binge/purging behavior, 3 (0.3%) met DSM-III-R criteria for bulimia nervosa, and one (0.1%) met criteria for anorexia nervosa. As the current investigation used a relatively diverse sample and a

psychometrically valid measure, it is likely that the incidence of bulimia nervosa uncovered reflects an accurate picture as to the number of women suffering from this disorder on the university included in this study.

In the current investigation, a positive relationship between bulimic symptomatology (i.e., higher BULIT-R scores) and sociocultural mores about attractiveness (i.e., higher BAQ scores) was uncovered. This finding is consistent with Mintz and Betz (1988) who found that bulimics had a greater tendency to endorse sociocultural beliefs regarding the desirability of female thinness and attractiveness than individuals classified into five other eating groups--normal eaters, chronic dieters, bingers, purgers, and subthreshold bulimia nervosa. Although causality cannot be determined from this study's methodology, researchers have hypothesized that societal expectations on female thinness and attractiveness are contributing to the prevalence of eating disorders in women. Specifically, Striegel-Moore et al. (1986) suggested that the higher prevalence rate of eating disorders among women may be the result of the shift in Western female beauty ideals towards an increasingly thin standard. Furthermore, other researchers have empirically demonstrated this emphasis on a thinner, more muscular body type by (a) decreases in hip and bust, and increases in waist measurements of Miss America contestants and winners and Playboy centerfolds from 1959 to 1978 and from 1979 to

1988, respectively (Garner, Garfinkel, Schwartz, & Thompson, 1980), and (b) increases in the frequency of diet articles in women's magazines from 1959 to 1988 (Wiseman, Gray, Mosimann, & Ahrens, 1992). Similarly, in the current investigation, women may have developed disordered eating attitudes and behaviors and/or pathogenic weight control behaviors (e.g., strict dieting, vomiting, laxatives) as a result of sociocultural pressures to achieve the thin ideal.

The BULIT-R also correlated significantly with all subscales of the PSPP except subscale 5. For example, individuals demonstrating greater bulimic symptomatology (i.e., higher BULIT-R scores) had a lower physical self-esteem (i.e., lower PSPP1 scores) than individuals exhibiting less bulimic symptomatology. These findings are consistent with previous research regarding lowered self-esteem in individuals displaying bulimic symptomatology (Katzman & Wolchik, 1984; Mintz & Betz, 1988; Shisslak, Pazda, & Crago, 1990). For example, Katzman and Wolchik (1984) found that women with bulimia nervosa, relative to a non-eating disordered control group, experienced poorer body image and lower self-esteem. Similarly, Shisslak et al. (1990) reported that bulimic women exhibited lower self-esteem than normal control subjects, with the lowest self-esteem being exhibited by underweight bulimic women. Likewise, Mintz and Betz (1988) found that the degree of disturbed eating in their participants was strongly

associated with lowered self esteem, with bulimic individuals evidencing the lowest self-esteem. These findings suggest that women endorsing bulimic symptomatology may be differentiated from non-eating disordered women in regards to their reported level of self-esteem. Specifically, women endorsing bulimic symptomatology appear likely to report lower self-esteem, including lower physical self-esteem, than non-eating disordered women.

Bulimic symptomatology (i.e., higher BULIT-R scores) also was related to individuals perceptions of their bodies as less attractive (i.e., lower PSPP3 scores) and of themselves as being less physically strong and muscular (i.e., lower PSPP4 scores). Striegel-Moore, Silberstein, Frensch, and Rodin (1989) in their study of male and female undergraduates found that a worsening of disordered eating among college freshmen females was associated with decreased ratings of their perceived attractiveness. These findings suggest that college females who perceive their bodies as unattractive and physically weak may be more likely to demonstrate disordered eating symptomatology, although they may fail to meet specific diagnostic criteria for an eating disorder.

In the current study, individuals were not satisfied with their current weight and wanted to be lighter, although this dissatisfaction did not differ as a result of exercise level. In addition, this dissatisfaction with current

weight was related to bulimic symptomatology in a direct, linear manner. These findings are consistent with other research concerning the body dissatisfaction of college students and it's relationship to disordered eating (Klemchuk, Hutchinson, & Frank, 1990; Mintz & Betz, 1988; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). For example, Striegel-Moore et al. (1989) investigated the prevalence of disordered eating among freshmen college students and found that a worsening of disordered eating among first year college students corresponded to an expressed dissatisfaction with weight.

Similar to other eating disorder research, this study found that eating disorder symptomatology in college females was associated with a greater endorsement of sociocultural beliefs about attractiveness, a lower physical self-esteem, a higher weight discrepancy (i.e., ideal - present weight), and the perception of their bodies as less attractive. That is, female college students who (a) report low self-esteem, (b) express dissatisfaction with their current weight, and (c) strongly endorse societal views regarding female physical attractiveness, also may evidence disordered eating behaviors or a diagnosable eating disorder.

Limitations

Some limitations exist in the current study which appear important to mention. First, the results of this study may have been biased due to the fact that both the

independent and dependent variables were based on self-report questionnaires. In terms of the prevalence of bulimia nervosa, however, the results of this study are consistent with previous research suggesting that the participants may have responded in an honest manner. Second, due to administrative difficulties, the last four questions on the PSPP scale were excluded from that questionnaire. As a result, these last five items of the PSPP were excluded in determining the participants scores on the subscales because each one corresponded to a different subscale. To correct for the omission of these items, the mean score of each subscale was used in the statistical analyses as opposed to the total score which usually is obtained by summing across the six items that comprise each subscale. Third, the sample utilized in this study was drawn from one college in the southwestern region of the United States, and thus, the generalizability of the results is likely to be affected.

Counseling Implications

The finding that 4.3 percent of the women in this study were classified with bulimia nervosa suggests that counselors need to be aware of the possible occurrence of eating disorders in the female college population. Specifically, women endorsing bulimic symptomatology may exhibit lower self-esteem and be more likely to strive towards achieving a thinner physique in an effort to achieve

society's ideal body type. In order to effectively diagnose and assist individuals with bulimia nervosa, therefore, counselors need to become familiar with the symptomatology as well as the psychological and attitudinal characteristics associated with this disorder.

The fact that exercise was not related to disordered eating in female undergraduates, but rather, to competence in sports, body attractiveness, and better physical condition, suggests that exercise may have positive, self-enhancing effects. In various outcome studies, other researchers have also found that regular exercise has positive psychological effects, such as improving mood and self-concept (Folkins & Sime, 1981; Raglin & Morgan, 1987; Young, 1979). Thus, counselors may want to consider exercise as an adjunct to more traditional insight-oriented individual therapy, particularly for those suffering from depressed mood and low self-esteem.

Implications for Future Research

Although this study failed to find any relationship between exercise duration and disordered eating and its correlates in female college students, additional research appears warranted. In the future, rather than addressing duration of exercise, investigators may want to examine the relationship of exercise intensity to disordered eating symptomatology since individuals who exercise the same number of hours per week may differ in their level of

physical exertion each session. Specifically, researchers may want to include only runners in their sample and determine how different levels of running are related to eating disorders. In addition, it may be beneficial to extend the number and type of outcome/dependent variables that are considered to include other psychological characteristics which have been associated with disordered eating (e.g., perfectionism, anxiety, body dissatisfaction).

In addition to more outcome variables being employed, it may be beneficial for investigators to address disordered eating in relation to exercise in other populations besides female college students (i.e., male college students, adolescents). Furthermore, disordered eating in relation to exercise may vary among different ethnic populations and subcultures (e.g., Asian, Hispanic, African-American). Future research with these populations is warranted as the generalizability of results will be limited by the composition of the sample.

Finally, it may be interesting to carry out longitudinal investigations to see if exercise leads to disordered eating or improved mental health overtime. Based on the results of these investigations, counselors may be able to assess the long term benefits of utilizing exercise in conjunction with therapy for certain clients.

Summary

The current study investigated the relationship of exercise duration to disordered eating, beliefs about attractiveness, and physical self-esteem. Although no relationship was found between exercise duration and disordered eating or beliefs about attractiveness, positive relationships were found between exercise and components of physical self-esteem. Specifically, individuals who reported exercising more hours per week acknowledged feeling more competent in sports, perceiving their bodies as more attractive, and being in better physical condition than those exercising fewer hours. While individuals may use exercise as a purging technique, it is not related directly to eating disorders. Additional research investigating exercise in relation to disordered eating, however, is needed which takes into consideration other factors that may not have been included in the present study but may nonetheless be important in determining if a relationship does exist.

# APPENDIX A

# DEMOGRAPHIC AND EXERCISE QUESTIONNAIRE

DEMOGRAPHIC AND EXERCISE QUESTIONNAIRE

DIRECTIONS: Please answer all items on this questionnaire honestly as they apply to you. All information you provide will be kept strictly confidential.

I. **PERSONAL DATA**

1. Age:_____

2. Marital Status: __Single __Married ____Divorced/Separated

3. Academic Rank in School:
___freshmen
___sophomore
___junior
___senior
___graduate school
___other (please specify)_____

4. Number of Years Attending an Institution of Higher Education (e.g., university, community college):_____

5. Cumulative Grade Point Average:
___3.5 - 4.0
___3.0 - 3.49
___2.5 - 2.99
___2.0 - 2.49
___less than 1.99

6. Academic Major (please specify):_____

7. Race/Ethnic Group: ___Black, non-Hispanic
___Caucasian
___Hispanic
___Asian-American
___Native American
___Other (please specify _____)

8. Religious Preference: ___Catholic
___Protestant
___Jewish
___Other Religion
(please specify_____)
___None

II. **PARENTAL DATA**

9. Birth Parents' Marital Status (please specify):
___married
___divorced
___separated

10. Father's occupation/job (please specify):_____

11. Mother's occupation/job (please specify):_____

12. Income Level of Parents:
___ 0 - 10,000
___ 10,001 - 25,000
___ 25,001 - 40,000
___ 40,001 - 60,000
___ greater than 60,001

13. How many siblings do you have?_____

III. **EXERCISE**
14. In an average week, how many total hours do you engage in planned exercise activities?_____

15. For the number of hours you indicated in Question 13, on the average, how many hours do you engage in the following exercise activities per week?
a. jogging/running_____
b. exercise program/aerobics class_____
c. bicycling_____
d. swimming_____
e. walking (hiking)_____
f. universal gym (super circuit)_____
g. weightlifting_____
h. jazzercise_____
i. exercycle_____
j. dancing/dance class_____
k. jumping rope_____
l. calisthenics_____
m. competitive sports (e.g.. basketball, tennis)_____
(please specify_____)
n. other sports activities_____
(please specify_____)

16. Do you typically engage in this exercise activity alone (yes/no)?_____

IV. WEIGHT HISTORY
17. Present Height: ____feet ____inches

18. Present Weight: ____lbs.

19. Your Ideal Weight: ____lbs.

20. Have your ever had a Weight Problem? _____YES _____NO
--IF YES, PLEASE ANSWER QUESTION 21. IF NO, PROCEED TO QUESTION 22.

21. What type of Weight Problem have you had (please specify):
    ____Anorexia Nervosa
    ____Bulimia Nervosa
    ____Unhealthy Underweight, but not to point of Anorexia Nervosa
    ____Underweight (wanted to gain weight but couldn't)
    ____Overweight (weight 10% higher than a normal comfortable weight)
    ____Obese (weight high enough to be a health risk and significantly interferes with your life)

22. Have you ever been in treatment for an eating disorder?
    ____YES ____NO

    IF YES, PLEASE SPECIFY WHAT TYPE:
    ____Anorexia Nervosa
    ____Bulimia Nervosa
    ____Obesity
    ____Other (please specify)_____

23. Are you currently in treatment for an eating disorder?
    ____YES ____NO
    IF YES, PLEASE SPECIFY WHAT TYPE:
    ____Anorexia Nervosa
    ____Bulimia Nervosa
    ____Obesity
    ____Other (please specify)_____

# APPENDIX B

## BULIMIA TEST REVISED (BULIT-R)

THE BULIT-R

DIRECTIONS: Answer each question by circling the response which best describes what you believe to be true about yourself. Please respond to all the items and answer them as honestly as possible. Remember, all of the information you provide will be kept strictly confidential.

1. I am satisfied with my eating patterns.

   a. agree
   b. neutral
   c. disagree a little
   d. disagree
   e. disagree strongly

2. Would you presently call yourself a "binge eater"?

   a. yes, absolutely
   b. yes
   c. yes, probably
   d. yes, possibly
   e. no, probably not

3. Do you feel you have control over the amount of food you consume?

   a. most or all of the time
   b. a lot of the time
   c. occasionally
   d. rarely
   e. never

4. I am satisfied with the shape and size of my body.

   a. frequently or always
   b. sometimes
   c. occasionally
   d. rarely
   e. seldom or never

5. When I feel that my eating behavior is out of control, I try to take rather extreme measures to get back on course (strict dieting, fasting, laxatives, diuretics, self-induced vomiting or vigorous exercise).

   a. always
   b. almost always
   c. frequently
   d. sometimes
   e. never or my eating behavior is never out of control

6. I use laxatives or suppositories to help control my weight.

   a. once a day or more
   b. 3-6 times a week
   c. once or twice a week
   d. 2-3 times a month
   e. once a month or less (or never)

7. I am obsessed about the size and shape of my body.

a. always
b. almost always
c. frequently
d. sometimes
e. seldom or never

8. There are times when I rapidly eat a very large amount of food.

a. mor than twice a week
b. twice a week
c. once a week
d. 2-3 times a month
e. once a month or less (or never)

9. How long have you been binge eating (eating uncontrollably to the point of stuffing yourself)?

a. not applicable; I don't binge eat
b. less than 3 months
c. 3 months - 1 year
d. 1 - 3 years
e. 3 or more years

10. Most people I know would be amazed if they knew how much food I can consume at one sitting.

a. without a doubt
b. very probably
c. probably
d. possibly
e. no

11. I exercise in order to burn calories.

a. more than 2 hours per day
b. about 2 hours per day
c. more than 1 but less than 2 hours per day
d. one hour or less per day
e. I exercise but not to burn calories or I don't exercise

12. Compared with women your age, how preoccupied are you about your weight and body shape?

a. a great deal more than average
b. much more than average
c. more than average
d. a little more than average
e. average or less than average

13. I am afraid to eat anything for fear that I won't be able to stop.

a. always
b. almost always
c. frequently
d. sometimes
e. seldom or never

14. I feel tormented by the idea that I am fat or might gain weight.

a. always
b. almost always
c. frequently
d. sometimes
e. seldom or never

15. How often do you intentionally vomit after eating?

a. 2 or more times a week
b. once a week
c. 2-3 times a month
d. once a month
e. less than once a month or never

16. I eat a lot of food when I'm not even hungry.

a. very frequently
b. frequently
c. occasionally
d. sometimes
e. seldom or never

17. My eating patterns are different from the eating patterns of most people.

a. always
b. almost always
c. frequently
d. sometimes
e. seldom or never

18. After I binge eat I turn to one of several strict methods to try to keep from gaining weight (vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives or diuretics).

a. never or I don't binge eat
b. rarely
c. occasionally
d. a lot of the time
e. most or all of the time

19. I have tried to lose weight by fasting or going on strict diets.

a. not in the past year
b. once in the past year
c. 2-3 times in the past year
d. 4-5 times in the past year
e. more than 5 times in the past year

20. I exercise vigorously and for long periods of time in order to burn calories.

a. average of less than average
b. a little more than average
c. more than average
d. much more than average
e. a great deal more than average

21. When engaged in an eating binge, I tend to eat foods that are high in carbohydrates (sweets and starches).

a. always
b. almost always
c. frequently
d. sometimes
e. seldom, or I don't binge

22. Compared to most people, my ability to control my eating behavior seems to be:

a. greater than others' ability
b. about the same
c. less
d. much less
e. I have absolutely no control

23. I would presently label myself a "compulsive eater" (one who engages in episodes of uncontrolled eating).

a. absolutely
b. yes
c. yes, probably
d. yes, possibly
e. no, probably not

24. I hate the way my body looks after I eat too much

a. seldom or never
b. sometimes
c. occasionally
d. a lot of the time
e. most or all of the time

25. When I am trying to keep from gaining weight, I feel that I have to resort to vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives, or diuretics.

a. never
b. rarely
c. occasionally
d. a lot of the time
e. most or all of the time

26. Do you believe that it is easier for you to vomit than it is for most people?

a. yes, it's no problem at all for me
b. yes, it's easier
c. yes, it's a little easier
d. about the same
e. no, it's less easy

27. I use diuretics (water pills) to help control my weight.

a. never
b. seldom
c. somtimes
d. frequently
e. very frequently

28. I feel that food controls my life.

a. always
b. almost always
c. frequently
d. sometimes
e. seldom or never

29. I try to control my weight by eating little or no food for a day or longer.

a. never
b. seldom
c. sometimes
d. frequently
e. very frequently

30. When consuming a large quantitiy of foood, at what rate of speed do you usually eat?

a. more rapidly than most people have ever eaten in their lives
b. a lot more rapidly than most people
c. a little more rapidly than most people
d. about the same rate as most people
e. more slowly than most people (or not applicable)

31. I use laxatives or suppositories to help control my weight.

a. never
b. seldom
c. sometimes
d. frequently
e. very frequently

32. Right after I binge eat I feel:

a. so fat and bloated I can't stand it
b. extremely fat
c. fat
d. a little fat
e. OK about how my body looks or I never binge eat

33. Compared to other people of my sex, my ability to always feel in control of how much I eat is:

a. about the same or greater
b. a little less
c. less
d. much less
e. a great deal less

34. In the last 3 months, on the average how often did you binge eat (eat uncontrollably to the point of stuffing yourself)?

a. once a month or less (or never)
b. 2-3 times a month
c. once a week
d. twice a week
e. more than twice a week

35. Most people I know would be surprised at how fat I look after I eat a lot of food.

a. yes, definitely
b. yes
c. yes, probably
d. yes, possibly
e. no, probably not or I never eat a lot of food

36. I use diuretics (water pills) to help control my weight.

a. 3 times a week or more
b. once or twice a week
c. 2-3 times a month
d. once a month
e. never

# APPENDIX C

## THE PHYSICAL SELF-PERCEPTION PROFILE (PSPP)

## WHAT AM I LIKE

These are statements which allow people to describe themselves. There are no right or wrong answers since people differ a lot.

First, decide which one of the two statements best describes you.

Then, go to that side of the statement and check if it is just "sort of true" or "really true" FOR YOU.

EXAMPLE

| Really True for Me | Sort of True for Me | | | | Sort of True for Me | Really True for Me |
|---|---|---|---|---|---|---|
| ☐ | ☐ | Some people are very competitive | BUT | Others are not quite so competitive | ☒ | ☐ |

REMEMBER to check only ONE of the four boxes

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | ☐ | ☐ | Some people feel that they are not very good when it comes to playing sports | BUT | Others feel that they are really good at just about every sport | ☐ | ☐ |
| 2. | ☐ | ☐ | Some people are not very confident about their level of physical conditioning and fitness | BUT | Others always feel confident that they maintain excellent conditioning and fitness | ☐ | ☐ |
| 3. | ☐ | ☐ | Some people feel that compared to most, they have an attractive body | BUT | Others feel that compared to most, their body is not quite so attractive | ☐ | ☐ |
| 4. | ☐ | ☐ | Some people feel that they are physically stronger than most people of their sex | BUT | Others feel that they lack physical strength compared to most others of their sex | ☐ | ☐ |
| 5. | ☐ | ☐ | Some people feel extremely proud of who they are and what they can do physically | BUT | Others are sometimes not quite so proud of who they are physically | ☐ | ☐ |
| 6. | ☐ | ☐ | Some people feel that they are among the best when it comes to athletic ability | BUT | Others feel that they are not among the most able when it comes to athletics | ☐ | ☐ |

| | Really True for Me | Sort of True for Me | | | | Sort of True for Me | Really True for Me |
|---|---|---|---|---|---|---|---|
| 7. | ☐ | ☐ | Some people make certain they take part in some form of regular vigorous physical exercise | BUT | Others don't often manage to keep up regular vigorous physical exercise | ☐ | ☐ |
| 8. | ☐ | ☐ | Some people feel that they have difficulty maintaining an attractive body | BUT | Others feel that they are easily able to keep their bodies looking attractive | ☐ | ☐ |
| 9. | ☐ | ☐ | Some people feel that their muscles are much stronger than most others of their sex | BUT | Others feel that on the whole their muscles are not quite so strong as most others of their sex | ☐ | ☐ |
| 10. | ☐ | ☐ | Some people are sometimes not so happy with the way they are or what they can do physically | BUT | Others always feel happy about the kind of person they are physically | ☐ | ☐ |
| 11. | ☐ | ☐ | Some people are not quite so confident when it comes to taking part in sports activities | BUT | Others are among the most confident when it comes to taking part in sports activities | ☐ | ☐ |
| 12. | ☐ | ☐ | Some people do not usually have a high level of stamina and fitness | BUT | Others always maintain a high level of stamina and fitness | ☐ | ☐ |
| 13. | ☐ | ☐ | Some people feel embarrassed by their bodies when it comes to wearing few clothes | BUT | Others do not feel embarrassed by their bodies when it comes wearing few clothes | ☐ | ☐ |
| 14. | ☐ | ☐ | When it comes to situations requiring strength some people are one of the first to step forward | BUT | When it comes to situations requiring strength some people are one of the last to step forward | ☐ | ☐ |
| 15. | ☐ | ☐ | When it comes to the physical side of themselves some people do not feel very confident | BUT | Others seem to have a real sense of confidence in the physical side of themselves | ☐ | ☐ |
| 16. | ☐ | ☐ | Some people feel that they are always one of the best when it comes to joining in sports activities | BUT | Others feel that they are not one of the best when it comes to joining in sports activities | ☐ | ☐ |

| | Really True for Me | Sort of True for Me | | | Sort of True for Me | Really True for Me |
|---|---|---|---|---|---|---|
| 17. | ☐ | ☐ | Some people tend to feel a little uneasy in fitness and exercise settings | BUT | Others feel confident and at ease at all times in fitness and exercise settings | ☐ ☐ |
| 18. | ☐ | ☐ | Some people feel that they are often admired because their physique or figure is considered attractive | BUT | Others rarely feel that they receive admiration for the way their body looks | ☐ ☐ |
| 19. | ☐ | ☐ | Some people tend to lack confidence when it comes to their physical strength | BUT | Others are extremely confident when it comes to their physical strength | ☐ ☐ |
| 20. | ☐ | ☐ | Some people always have a really positive feeling about the physical side of themselves | BUT | Others sometimes do not feel positively about the physical side of themselves | ☐ ☐ |
| 21. | ☐ | ☐ | Some people are sometimes a little slower than most when it comes to learning new skills in a sports situation. | BUT | Others have always seemed to be among the quickest when it comes to learning new sports skills | ☐ ☐ |
| 22. | ☐ | ☐ | Some people feel extremely confident about their ability to maintain regular exercise and physical condition | BUT | Others don't feel quite so confident about their ability to maintain regular exercise and physical condition | ☐ ☐ |
| 23. | ☐ | ☐ | Some people feel that compared to most, their bodies do not look in the best of shape | BUT | Others feel that compared to most their bodies always look in excellent physical shape | ☐ ☐ |
| 24. | ☐ | ☐ | Some people feel that they are very strong and have well developed muscles compared to most people | BUT | Others feel that they are not so strong and their muscles are not very well developed | ☐ ☐ |
| 25. | ☐ | ☐ | Some people wish that they could have more respect for their physical selves | BUT | Others always have great respect for their physical selves | ☐ ☐ |
| 26. | ☐ | ☐ | Given the chance, some people are always one of the first to join in sports activities | BUT | Other people sometimes hold back and are not usually among the first to join in sports | ☐ ☐ |

# APPENDIX D

## BELIEFS ABOUT ATTRACTIVENESS QUESTIONNAIRE (BAQ)

**BAQ**

Directions: Listed below is a series of statements about attractiveness in our society. For each item, please circle the response which best describes what you believe to be true according to the following scale:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly Disagree | Disagree | Disagree Somewhat | Neither Agree nor Disagree | Agree Somewhat | Agree | Strongly Agree |

Remember, it is **very important** that you respond to **all** the items and that you answer them **honestly**. All of the information you provide will be kept **strictly confidential**.

1. A man would always prefer to go out with a thin woman than with one who is heavy.
1 2 3 4 5 6 7

2. Fat people shouldn't bother to spend money on clothes, since they look lousy no matter what they wear.
1 2 3 4 5 6 7

3. Fat people are unhappy because of the way they look.
1 2 3 4 5 6 7

4. It is true that attractive people are more interesting, poised, and socially outgoing than unattractive people.
1 2 3 4 5 6 7

5. A pretty face will not get you very far without a slim body.
1 2 3 4 5 6 7

6. Being attractive is more important for men than for women.
1 2 3 4 5 6 7

7. Overweight people are stigmatized in our society.
1 2 3 4 5 6 7

8. Attractive people lead more fulfilling lives than unattractive people.
1 2 3 4 5 6 7

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly Disagree | Disagree | Disagree Somewhat | Neither Agree nor Disagree | Agree Somewhat | Agree | Strongly Agree |

9. Obese persons are weak willed and self-indulgent.
1 2 3 4 5 6 7

10. The thinner a woman is, the more attractive she is.
1 2 3 4 5 6 7

11. Attractiveness decreases the likelihood of professional success.
1 2 3 4 5 6 7

12. Current magazines and newspapers make it clear that being very thin is the current beauty ideal.
1 2 3 4 5 6 7

# APPENDIX E

# INFORMED CONSENT FORM

I agree to voluntarily participate in a study concerning exercising and eating patterns of female college students. As a participant in this study, I agree to complete a series of questionnaires designed to measure variables, such as amount and type of exercise, eating patterns, and physical self-esteem. I understand that, following completion of the questionnaires, no additional time will be required or requested by the investigator. The purpose of this study is to better understand the relationship, if any, between amount of exercise, weight, and patterns of eating.

I understand that all information I provide will be confidential, and will not be recorded in anyway that could identify me personally. In addition, I understand that there is no personal risk or discomfort directly involved with this research and that I am free to discontinue participation at any time.

If I have any questions or problems that arise in connection with my participation in this study, I should contact Annette Helmcamp or supervisor, Dr. Trent Petrie, Department of Psychology, 565-2671 (work).

_____ _____

(Date) (Participant's Signature)

_____ _____

(Date) (Investigator's Signature)

THIS PROJECT HAS BEEN REVIEWED BY UNIVERSITY OF NORTH TEXAS COMMITTEE FOR THE PROTECTION OF HUMAN SERVICES (Phone 565-3940)

# REFERENCES

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

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

Blair, S.N., Gibbons, L.W., Painter, P., Rate, R., Taylor, C.B., & Will, J. (1986). Guidelines for exercise testing and prescription, third edition. Philadephia: Lea & Febiger.

Boskind-Lodahl, M. (1976). Cinderella's step-sisters: A feminist perspective on anorexia nervosa and bulimia. Signs: Journal of Women in Culture and Society, 2, 342-356.

Bowen-Woodward, K., & Levitz, L.S. (1989). Impact of the college environment on bulimic women. In L.C. Whitaker & W.N. Davis (Eds.), The bulimic college student (pp. 181-190). New York: Haworth.

Brownell, K.D. (1991). Dieting and the search for the perfect body: Where physiology and culture collide. Behavior Therapy, 22, 1-12.

Bruch, H. (1965). Anorexia nervosa--its differential diagnosis. Journal of Mental Nervous Diseases, 141, 555-566.

Cash, T.F. & Brown, T.A. (1987). Body image in anorexia nervosa and bulimia nervosa a review of the literature. Behavior Modification, 11(4), 487-521.

Channon, S., de Silva, P., Hemsley, D., & Mukherjee, K. (1990). Body-size perception and preferences in stable-weight and improved-weight anorexic patients. International Journal of Eating Disorders, 9(4), 403 408.

Collingwood, T.R. (1972). The effects of physical training upon behavior and self attitudes. Journal of Clinical Psychology, 28, 583-585.

Collingwood, T.R., & Willet, L. (1971). The effects of physical training upon self-concept and body attitude. Journal of Clinical Psychology, 27, 411-412.

Connors, M.E. & Johnson, C.L. (1987). Epidemiology of bulimia and bulimic behaviors. Addictive Behaviors, 12, 165-179.

Cooper, J.L., Morrison, T.L., Bigman, O.L., Abramowitz, S.I., Levin, S., & Krener, P. (1988). Mood changes and affective disorder in the bulimic binge-purge cycle. International Journal of Eating Disorders, 7(4), 469-474.

Cooper, P.J. & Taylor, M.J. (1988). Body image disturbance in bulimia nervosa. British Journal of Psychiatry, 153(2), 32-36.

Crisp, A.H., Palmer, R.L., and Kalucy, R.S. (1976). How common is anorexia nervosa? A prevalence study. British Journal of Psychiatry, 128, 549-554.

Davis, B. & Cowles, M. (1989). A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. Journal of Psychosomatic Research, 33(5), 527-536.

Davis, C. (1990). Weight and diet preoccupation and addictiveness: The role of exercise. Personality and Individual Differences, 11(8), 823-827.

Dickstein, L. (1989). Current college environments: Do these communities facilitate and foster bulimia in vulnerable students? In L.C. Whitaker & W.N. Davis (Eds.), The bulimic college student (pp. 107-133). New York: Haworth.

Druss, V., & Henifin, M.S. (1979). Why are so many anorexics women? In R. Hubbard & M.S. Henifin (Eds.), Women looking at biology looking at women: A collection of feminist critiques. Cambridge: Schnenkman.

Elmore, E.K., & Castro, J.M. (1990). Self-rated moods and hunger in relation to spontaneous eating behavior in bulimics, recovered bulimics, and normals. International Journal of Eating Disorders, 9(2), 179 190.

Epling, W.F. & Pierce, W.D. (1988). Activity-based anorexia: A biobehavioral perspective. International Journal of Eating Disorders, 7, 475-485.

Epling, W.F., Pierce, W.D., & Stefan, L. (1983). A theory of activity-based anorexia. International Journal of Eating Disorders, 3(1), 27-43.

Eysenck, H.J. & Eysenck, S.B.G. (1975). Manual of the Eysenck personality questionnaire. London: Hodd.

Fitts, W.H. (1965). Tennessee self-concept scale manual. Nashville, Tenn.: Counselor Recordings and Tests.

Folkins, C.H. (1976). Effects of physical training on mood. Journal of Clinical Psychology, 32(2), 385-388.

Folkins, C.H., & Sime, W.E. (1981). Physical fitness training and mental health. American Psychologist, 36(4), 373-389.

Fox, K., & Corbin, C. (1989). The physical self perception profile: Development and preliminary validation. Journal of Sport and Exercise Psychology, 11, 408-430.

Garfinkel, P.E., & Garner, D.M. (1982). Anorexia nervosa: A multidimensional perspective. New York: Brunner/Mazel.

Garfinkel, P.E., Moldofsky, H., & Garner, D.M. (1980). The heterogeneity of anorexia nervosa. Archives of General Psychiatry, 37, 1036-1040.

Garner, D.M., & Garfinkel, P.E. (1978). Sociocultural factors in anorexia nervosa. Lancet, 2, 674.

Garner, D.M., Garfinkel, P.E., Rockert, W., & Olmstead, M.P. (1987). A prospective study of eating disorders in the ballet. Psychotherapy and Psychosomatics, 48, 170-175.

Garner, D.M., Garfinkel, P.E., Schwartz, D., & Thompson, M. (1980). Cultural expectations of thinness in women. Psychological Reports, 47, 483-491.

Garner, D.M., Olmstead, M.P., Bohr, Y., & Garfinkel, P.E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. Psychological Medicine, 12, 871-878.

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

Garner, D.M., Rockert, W., Olmsted, M.P., Johnson, C.L., & Coscina, D.V. (1985). Psychoeducational principles in the treatment of bulimia and anorexia nervosa. In D.M. Garner and P.E. Garfinkel (Eds.), A handbook of psychotherapy for anorexia nervosa and bulimia, pp. 513-572. New York: Guilford Press.

Gebhardt, D.L., & Crump, C.E. (1990). Employee fitness and wellness programs in the workplace. American Psychologist, 45(2), 262-272.

Gowers, S., & McMahon, J.B. (1989). Social class and prognosis in anorexia nervosa. International Journal of Eating Disorders, 8(1), 105-109.

Hadigan, C.M. & Walsh, B.T. (1991). Body shape concerns in bulimia nervosa. International Journal of Eating Disorders, 10(3), 323-331.

Hamilton, L.H., Brooks-Gunn, J., & Warren, M.P. (1985). Sociocultural influences on eating disorders in professional female ballet dancers. International Journal of Eating Disorders, 4(4), 465-477.

Harding, T.P., & Lachenmeyer, J.R. (1986). Family interaction patterns and locus of control as predictors of the presence and severity of anorexia nervosa. Journal of Clinical Psychology, 42(3), 440-448.

Harris, M.G., & Greco, D. (1990). Weight control and weight concern in competitive female gymnasts. Journal of Sport and Exercise Psychology, 12, 427-433.

Hart, K.J., & Ollendick, T.H. (1985). Prevalence of bulimia in working and university women. American Journal of Psychiatry, 142(7), 851-854.

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

Head, S.B., & Williamson, D.A. (1990). Association of family environment and personality disturbances in bulimia nervosa. International Journal of Eating Disorders, 9(6), 667-674.

Herzog, D.B. (1987). Social impairment in bulimia. International Journal of Eating Disorders, 6(6), 741 747.

Hilyer, J.C., & Mitchell, W. (1979). Effect of systematic physical fitness training combined with counseling on the self-concept of college students. Journal of Counseling Psychology, 26(5), 427-436.

Horowitz, J.M. (1990, July 30). From work-outs to wellness. Time, p.64.

Hsu, L.K.G. & Sobkiewicz, T.A. (1991). Body image disturbance: Time to abandon the concept for eating disorders? International Journal of Eating Disorders, 10(1), 15-30.

Hudson, J.I., Harrison, G.P., Jr., Jonas, J.M., & Yurgelun-Todd, D. (1983). Family history study of anorexia nervosa and bulimia. British Journal of Psychiatry, 142, 133-138.

Hurley, J.B., Palmer, R.L., & Stretch, D. (1990). The specificity of the eating disorders inventory: A reappraisal. International Journal of Eating Disorders, 9(4), 419-424.

Johnson, C., Tobin, D.L., and Lipkin, J. (1989). Epidemiologic changes in bulimic behavior among female adolescents over a five-year period. International Journal of Eating Disorders, 8(6), 647-655.

Jones, J.K. (1989). Bulimia: Determining prevalence and examining intervention. Journal of American College Health, 37, 231-233.

Katz, J.L. (1986). Long-distance running, anorexia nervosa, and bulimia a report of two cases. Comprehensive Psychiatry, 27(1), 74-78.

Katzman, M.A., & Wolchik, S.A. (1984). Bulimia and binge eating in college women: A comparison of personality and behavior characteristics. Journal of Consulting and Clinical Psychology, 52(3), 423-428.

Katzman, M.A., Wolchik, S.A., & Braver, S.L. (1984). The prevalence of frequent binge eating and bulimia in a non-clinical college sample. International Journal of Eating Disorders, 3, 53-62.

Kendell, R.E., Hall, D.J., Harley, A., & Babigan, H.M. (1973). The epidemiology of anorexia nervosa. Psychological Medicine, 2, 200-203.

Kiemle, G., Slade, P.D., & Dewey, M.E. (1987). Factors associated with abnormal eating attitudes and behaviors: Screening individuals at risk of developing an eating disorder. International Journal of Eating Disorders, 6(6), 713-724.

Klemchuk, H.P., Hutchinson, C.B., & Frank, R.I. (1990). Body dissatisfaction and eating-related problems on the college campus: Usefulness of the eating disorder inventory with a nonclinical population. Journal of Counseling Psychology, 37(3), 297-305.

Klesges, R.C., Mizes, J.S., & Klesges, L.M. (1987). Self-help dieting strategies in college males and females. International Journal of Eating Disorders, 6(3), 409-417.

Kog, E. & Vandereycken, W. (1989). The facts: A review of research data on eating disorder families. The family approach to eating disorders assessment and treatment of anorexia nervosa and bulimia (pp. 25-67). New York: PMA Publishing Corp.

Kog, E., & Vandereycken, W. (1989). Family interaction in eating disorder patients and normal controls. International Journal of Eating Disorders, 8(1), 11-23.

Kron, L., Katz, J., Gorzynski, G., & Weiner, H. (1978). Hyperactivity in anorexia nervosa: A fundamental clincial feature. Comprehensive Psychiatry, 19(5), 433-440.

Lacey, J.H., Coker, S., & Birtchnell, S.A. (1986). Bulimia: Factors associated with its etiology and maintenance. International Journal of Eating Disorders, 5, 475-487.

Laessle, R.G., Kittl, S., Fichter, M.M., & Pirke, K.M. (1988). Cognitive correlates of depression in patients with eating disorders. International Journal of Eating Disorders, 7(5), 681-686.

Laessle, R.G., Tuschl, R.J., Waadt, S., & Pirke, K.M. (1989). The specific psychopathology of bulimia nervosa: A comparison with restrained and unrestrained (normal) eaters. Journal of Consulting and Clinical Psychology, 57(6), 772-775.

Lewis, L.D. & Johnson, C. (1985). A comparison of sex role orientation between women with bulimia and normal controls. The International Journal of Eating Disorders, 4, 247-257.

Lundholm, J.K., & Littrell, J.M. (1986). Desire for thinness among high school cheerleaders: Relationship to disordered eating and weight control behaviors. Adolescence, 21(83), 573-579.

Mann, A.H., Wakeling, A., Wood, K., Monck, E., Dobbs, R., and Szmukler, G.I. (1983). Screening for abnormal eating attitudes and psychiatruc morbidity in an unselected population of 15-year-old schoolgirls. Psychological Medicine, 13, 573-580.

Mintz, L.B., & Betz, N.E. (1988). Prevalence and correlates of eating disordered behaviors among undergraduate women. Journal of Counseling Psychology, 35(4), 463-471.

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

Mitchell, J.E., & Eckert, E.D. (1987). Scope and significance of eating disorders. Special issues: Eating disorders. Journal of Consulting and Clinical Psychology, 55, 628-634.

Mizes, J.S. (1988). Personality characteristics of bulimic and non-eating-disordered female controls: A cognitive behavioral perspective. International Journal of Eating Disorders, 7(4), 541-550.

Moos, R.H., & Moos, B.S. (1981). Family environment scale manual. Palo Alto, CA: Consulting Psychologists Press.

Morris, A., Cooper, T., & Cooper, P.J. (1989). The changing shape of female fashion models. International Journal of Eating Disorders, 8(5), 593-596.

Nasser, M. (1986). Comparative study of the prevalence of abnormal eating attitudes among Arab female students of both London and Cairo Universities. Psychological Medicine, 16, 621-625.

Nevo, S. (1985). Bulimic symtoms: Prevalence and ethnic differences among college women. International Journal of Eating Disorders, 4, 151-168.

Niknian, M., Lefebvre, C., & Carleton, R. (1991). American Journal of Public Health, 81, 203-205.

Nudelman, S., Rosen, J.C., & Leitenberg, H. (1988). Dissimilarities in eating attitudes, body image distortion, depression, & self-esteem between high intensity male runners & women with bulimia nervosa. International Journal of Eating Disorders, 7(5), 625 634.

Ousley, L.B. (1986). Differences among bulimic subgroups, binge eaters, and normal eaters in a female college population. Unpublished doctoral dissertation, University of California, Santa Barbara.

Owens, R.G., & Slade, P.D. (1987). Running and anorexia nervosa: An empirical study. International Journal of Eating Disorders, 6(6), 771-775.

Pasman, L. & Thompson, J.K. (1988). Body image and eating disturbance in obligatory runners, obligatory weightlifters, and sedentary individuals. International Journal of Eating Disorders, 7(6), 759 769.

Polivy, J. and Herman, C.P. (1987). Diagnosis and treatment of normal eating. Journal of Consulting and Clinical Psychology, 55(5), 635-644.

Pope, H.G., & Hudson, J.I. (1984). New hope for binge eaters. New York: Harper & Row.

Pope, H.G., Hudson, J.I., & Yurgelun-Todd, D. (1984). Anorexia nervosa and bulimia among 300 suburban women shoppers. American Journal of Psychiatry, 141(2), 292 294.

Pope, H.G., Hudson, J.I., Yurgelun-Todd, D., & Hudson, M.S. (1984). Prevalence of anorexia nervosa and bulimia in three student populations. International Journal of Eating Disorders, 3(3), 45-51.

Pyle, R.L., Halvorsen, P., Neuman, P., & Mitchell, J. (1986). The increasing prevalence of bulimia in freshmen college students. International Journal of Eating Disorders, 5, 631-647.

Pyle, R.L., Neuman, P.A., Halvorson, P.A., & Mitchell, J.E. (1991). An ongoing cross-sectional study of the prevalence of eating disorders in freshmen college students. International Journal of Eating Disorders, 10(6), 667-677.

Radke-Sharpe, N., Whitney-Saltiel, D., & Rodin, J. (1990). Fat distribution as a risk factor for weight and eating concerns. International Journal of Eating Disorders, 9(1), 27-36.

Raglin, J.S., & Morgan, W.P. (1987). Influence of exercise and quiet rest on state anxiety and blood pressure. Medicine and Science in Sports and Exercise, 19(5), 456-463.

Richert, A.J., & Hummers, J.A. (1986). Patterns of physical activity in college students at possible risk for eating disorder. International Journal of Eating Disorders, 5(4), 757-763.

Rosen, A.M., Murkofsky, C.A., Steckler, N.M., & Skolnick, N.J. (1989). A comparison of psychological and depressive symptoms among restricting anorexic, bulimic anorexic, and normal-weight bulimic patients. International Journal of Eating Disorders, 8(6), 657 663.

Rosen, J.C., Silberg, N.T., & Gross, J. (1988). Eating Attitudes Test and Eating Disorders Inventory: Norms for adolescent girls and boys. Journal of Consulting and Clinical Psychology, 56, 305-308.

Rosen, L.W., & Hough, D.O. (1988). Pathogenic weight control behaviors of female college gymnasts. The Physician and Sportsmedicine, 16(9), 142-146.

Rosen, L.W., McKeag, D.B., Hough, D.O., & Curley, V. (1986). Pathogenic weight control in female athletes. The Physician and Sportsmedicine, 14, 79-86.

Schlesier-Stropp, B. (1984). Bulimia: A review of the literature. Psychological Bulletin, 95, 247-257.

Schmidt, N.B., & Telch, M.J. (1990). Prevalence of personality disorders among bulimics, nonbulimic binge eaters, and normal controls. Journal of Psychopathology and Behavioral Assessment, 12(2), 169 185.

Seaver, R.L., & Binder, H.J. (1972). Anorexia nervosa and other anorectic states in man. Advanced Psychosomatic Medicine, 7, 257-276.

Shisslak, C.M., Crago, M., Neal, M.E., & Swain, B. (1987). Primary prevention of eating disorders. Journal of Consulting and Clinical Psychology, 55(5), 660-667.

Shisslak, C.M., Pazda, S.L., & Crago, M. (1990). Body weight and bulimia as discriminators of psychological characteristics among anorexic, bulimic, and obese women. Journal of Abnormal Psychology, 99(4), 380-384.

Silber, T.J. (1986). Anorexia nervosa in Blacks and Hispanics. International Journal of Eating Disorders, 5, 121-128.

Silverstein, B., Perdue, L., Peterson, B., Vogel, L., & Fantini, D.A. (1986). Possible causes of the thin standard of bodily attractiveness for women. International Journal of Eating Disorders, 5(5), 907 916.

Silverstein, B., Perdue, L., Peterson, B., & Kelly, E. (1986). The role of the mass media in promoting a thin standard of bodily attractiveness for women. Sex Roles, 14(9/10), 519-532.

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

Squires, R.L., & Kagan, D.M. (1985). Sex-role and eating behaviors among college women. International Journal of Eating Disorders, 4(4), 539-548.

Stein, D.M. (1991). The prevalence of bulimia: A review of the empirical research. Journal of Nutrition Education, 23(5), 205-213.

Stern, S.L., Dixon, K.N., Jones, K., Lake, M., Nemzer, E., & Sansone, R. (1989). Family environment in anorexia nervosa and bulimia. International Journal of Eating Disorders, 8(1), 25-31.

Striegel-Moore, R., McAvay, G., & Rodin, J. (1986). Psychological and behavioral correlates of feeling fat in women. International Journal of Eating Disorders, 5(5), 935-947.

Striegel-Moore, R.H., Silberstein, L.R., Frensch, P., & Rodin, J. (1989). A prospective study of disordered eating among college students. International Journal of Eating Disorders, 8(5), 499-509.

Striegel-Moore, R.H., Silberstein, L.R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. American Psychologist, 41(3), 246-260.

Strober, M., & Humphrey, L.L. (1987). Familial contributions to the etiology and course of anorexia nervosa and bulimia. Journal of Consulting and Clinical Psychology, 55(5), 654-659.

Strober, M., Lampert, C., Morrell, W., Burroughs, J., & Jacobs, C. (1990). A controlled family study of anorexia nervosa: Evidence of familial aggregation and lack of shared transmission with affective disorder. International Journal of Eating Disorders, 9(3), 239 253.

Szmukler, G.I. (1983). Weight and food preoccupation in a population of English schoolgirls. In G.J. Bargman (Ed.), Understanding anorexia nervosa and bulimia (pp. 21-27). Fourth Ross Conference on Medical Research. Ohio: Ross Laboratories.

Szmukler, J.I. (1985). The epidemiology of anorexia nervosa and bulimia. Journal of Psychiatric Research, 19, 143-153.

Teusch, R. (1988). Level of ego development and bulimics' conceptualizations of their disorder. International Journal of Eating Disorders, 7(5), 607 615.

Thelen, M., Farmer, J., Wonderlich, S., & Smith, M. (1991). A revision of the Bulimia Test: The BULIT-R. Psychological Assessment: Journal of Consulting and Clinical Psychology, 3(1), 119-124.

Thelen, M.H., Farmer, J., Mann, L.M., & Pruitt, J. (1990). Bulimia and interpersonal relationships: A longitudinal study. Journal of Counseling Psychology, 73(1), 85-90.

Thompson, D.A., Berg, K.M., & Shatford, L.A. (1987). The heterogeneity of bulimic symtomatology: Cognitive and behavioral dimensions. International Journal of Eating Disorders, 6(2), 215-234.

Timko, D., Striegel-Moore, R.H., Silberstein, L.R., & Rodin, J. (1987). Femininity/masculinity and disordered eating in women: How are they related? International Journal of Eating Disorders, 6(6), 701 712.

Touyz, S.W., Beumont, P.J.V., & Hook, S. (1987). Exercise anorexia: A new dimension in anorexia nervosa? In Beumont, P.J.V., Burrows, G.D., & Casper, R.C. (Eds.), Handbook of eating disorders part 1: Anorexia and bulimia nervosa (pp. 143-157). New York: Elsevier Science Publishers B.V. (Biomedical Division).

Vanderheyden, D.A., & Boland, F.J. (1987). A comparison of normals, mild, moderate, and severe binge eaters, and binge vomiters using discriminant function analysis. International Journal of Eating Disorders, 6(3), 331-337.

Veale, D.M.W. (1987). Exercise dependence. British Journal of Addiction, 82, 735-740.

Ward, A. (1990, December 3). Americans step into a new fitness market. Advertising Age, pp. 33, 39.

Weight, L.M., & Noakes, T.D. (1987). Is running an analog of anorexia?: A survey of the incidence of eating disorders in female distance runners. Medicine and Science in Sports and Exercise, 19(3), 213-217.

Welch, G., Hall, A., & Renner, R. (1990). Patient subgroupings in anorexia nervosa using psychologically based classification. International Journal of Eating Disorders, 9(3), 311-322.

Whitaker, L.D., & Davis, W.N. (1989). The bulimic college student. New York: Haworth.

Whitehouse, A.M. & Mumford, D.B. (1988). Increased prevalence of bulimia nervosa amongst Asian Schoolgirls. British Medical Journal, 297, 718.

Williamson, D.A., Davis, C.J., Goreczny, A.J., & Blouin, D.C. (1989). Body-image disturbances in bulimia nervosa: Influences of actual body size. Journal of Abnormal Psychology, 98(1), 97-99.

Williamson, D.A., Kelley, M.L., Davis, C.J., Ruggiero, L., & Blouin, D.C. (1985). Psychopathology of eating disorders: A controlled comparison of bulimic, obese, and normal subjects. Journal of Consulting and Clinical Psychology, 53(2), 161-166.

Willmuth, M.E., Leitenberg, H., Rosen, J.C., & Cado, S. (1988). A comparison of purging and nonpurging normal weight bulimics. International Journal of Eating Disorders, 7(6), 825-835.

Wiseman, C.V., Gray, J.J., Mosimann, J.E., & Ahrens, A.H. (1992). Cultural expectations of thinness in woman: An update. International Journal of Eating Disorders, 11(1), 85-89.

Wolf, E.M. & Crowther, J.H. (1983). Personality and eating habit variables as predictors of severity of binge eating and weight. Addictive Behaviors, 8, 335 344.

Yates, A. (1991). Compulsive exercise and the eating disorders toward an integrated theory of activity. New York: Brunner/Mazel Inc.

Yates, A., Leehey, K., & Shisslak, C.M. (1983). Running an analogue of anorexia? New England Journal of Medicine, 308(5), 251-255.

Young, R.J. (1979). The effect of regular exercise on cognitive functioning and personality. British Journal of Sports Medicine, 13, 110-117.