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The Impact of Sports Participation on Adolescent Eating Disorders

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THE IMPACT OF SPORTS PARTICIPATION ON ADOLESCENT EATING DISORDERS

JOYCE BARKER, B.S.

Abstract Presented to the Faculty of the Graduate School
of Lindenwood University in Partial Fulfillment of the
Requirements for the Degree of
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ABSTRACT

In an effort to assess the impact of sports participation on adolescent eating disorders, information was obtained from 58 high school females. Of this sample, 20 students were athletes (soccer, track, and gymnasts), 7 students were performance squad members (e.g., cheerleaders), and 31 students were not engaged in these activities. A measure of adolescent eating disorder, the Eating Disorder Inventory II (EDI-2), and a demographic survey, were administered to all participants. Although sports and performance squads emphasized body shape and control, involvement in these organized physical activity contexts did not differentiate adolescents most at risk.

THE IMPACT OF SPORTS PARTICIPATION

ON ADOLESCENT EATING DISORDERS

JOYCE BARKER, B.S.

A Culminating Project Presented to the Faculty of the
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COMMITTEE IN CHARGE OF CANDIDACY:

Adjunct Assistant Professor Edward Doerr

Associate Professor Pam Nickels,
Chair and Advisor

Adjunct Assistant Professor Martin Rosso

DEDICATION

This paper is dedicated to my loving and understanding husband, Stan; and son, Brett; and also to Carol Baer; who gave me the confidence to return to school and fulfill my life time dream of becoming a school counselor.

ACKNOWLEDGMENTS

I wish to acknowledge the administration and teachers of Francis Howell North High School who gave their permission and assistance with the study. Special acknowledgment is directed to Mrs. Judi Rogers who deciphered and typed this manuscript. Further thanks are extended to all the subjects of the study who participated willingly and in a timely fashion.

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Chapter 1

INTRODUCTION

Female athletes have gone to extraordinary lengths to reduce their body fat stores in an effort to improve performance. Eating disorders are so prevalent, especially among adolescents, that they are regarded as a serious public health problem. Anorexia nervosa, bulimia, and exercise bulimia are increasingly common in young athletes. Research indicates that in the high school population 13%-17% of eating disorders occur by the average age of 15 (Rosen, McKeag, Hough, & Curley, 1986). Although all adolescents are exposed to social pressure for thinness, only a small minority develop anorexia or any form of bulimia nervosa. The frequency of anorexia nervosa among adolescent girls ranges from 0.7% to 4.2% (average 1%) (Crisp, Hsu & Harding, 1980; Pope, Hudson, & Yurgelun-Todd, 1984), and the frequency of bulimia nervosa varies from 4% to 14% (average 6%). The incidence of eating behavior disorders in adolescent girls averages 40% for binging, 35% for fasting, and 10% for purging (Johnson, Sanson, & Chewing, 1992; Pope, Hudson, Yurgelun-Todd, 1984).

Statement of Purpose

Given the paucity of current research on the relationship between eating disorders and various forms of activity involvement for adolescent females, the purpose of this study was to determine whether adolescent females involved in organized physical activities were more at risk than nonparticipants in these activities for disordered eating tendencies. Female athletes have been identified as a potential risk group for the development of eating disorders. Although adolescents in general are particularly vulnerable to the onset of eating disorders, little research has examined the problem among high school female athletes. The present study explored this population by comparing female athletes and non-athletes in terms of behavioral and psychological traits associated with eating disorders.

Hypothesis

The null hypothesis states that there was no significant difference in the risk for disturbed eating patterns (as measured by scores on the Eating Disorder Inventory-2 [EDI-2], a paper/pencil inventory) between females involved in high school sport teams and performance squads (participants) as compared to non-participants.

Chapter II

LITERATURE REVIEW

Many experts believe the world of sports is a likely arena for the development of eating disorders. Studies have shown a positive correlation between amount of exercise and subjects displaying tendencies toward eating disorders (Crisp, Hsu, & Harding, 1980; Epling, Pierce, & Stefan, 1984; Richert & Hummers, 1986). Athletes share many characteristics that have been found in anorexia patients. McSherry (cited in Slavin, 1987) noted that athletes and anorexics share such features as dietary faddism, controlled calorie consumption, specific carbohydrate avoidance, low body weight, hypotension, increased physical activity, and amenorrhea, or menstrual irregularity.

Leichner (1986) draws a parallel between athletes and individuals with eating disorders on such traits as high self-expectations, rigid and obsessional approach to reaching goals, perfectionism, and high emphasis on emotional control. Other factors include the propensity to self-deprivation and isolation and the intense pressure to be slim and perform (Garner & Garfinkel, 1990.)

Eating Disorders

According to the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; American Psychiatric Association, 1994), a person who has anorexia nervosa weighs 15% below what is considered normal for his or her height and age, has an intense fear of gaining weight, has a disturbed body image, and, in women, has primary or secondary amenorrhea (mentrual irregularity).

Symptoms of bulimia nervosa differ. They include:

* recurrent episodes of binge eating (a minimum of two binge episodes a week for at least three months),
* lack of control over behavior during binges,
* regular use of self-induced vomiting, laxatives, and diuretics,
* strict dieting,
* vigorous exercise to prevent weight gain, and
* a persistent overconcern with body shape and weight.

Eating disorders fall at the extreme end of a broad range of eating problems. Mimi Johnson, M.D., a specialist in pediatric and young adult sports medicine at Washington Sports Medicine Clinic at Kirkland, Washington, makes a distinction between eating disorders and disordered

eating. Many athletes show signs of disordered eating but don't meet the DSM IV criteria for an eating disorder, she says. They may restrict food intake significantly but not enough to become anorexic. They may binge and purge only once every three months or even once a week and still not meet the DSM IV criteria for bulimia (Nattiv & Lynch, 1994). About five million people in the United States suffer from eating disorders, 99 percent of them women, according to the National Institute of Mental Health (McGinley, 1996).

The emergence of a new eating disorder, exercise bulimia, has recently emerged. Although not listed in the DSM IV, exercise bulimia is achieving more and more attention. The exercise bulimic may or may not purge; exercise itself becomes the purge. Exercise bulimia may exist by itself or it may intertwine with other aspects of anorexia and bulimia. Essentially the individual begins to overvalue thinness. Excessive exercise may become payment in advance for binge foods or penance for foods already consumed (McGinley, 1996).

Exercise bulimia is easy to hide, especially in athletes, because exercise is encouraged. For most women, exercise is an outlet, a balanced part of their lives, but for some it moves out of the realm of the normal and becomes an obsession (McGinley, 1996).

No one really knows how widespread exercise bulimia may be, because it is just beginning to be recognized, but certainly there is significant pressure on women, from the time they're young girls, to be thin and in shape. In 1990, 85 percent of all 12-year-old girls had been on a diet of some form, according to the eating disorders council.

While exercise in moderation is by far the best medicine, enhancing physical and mental health, in the extreme it can do irreparable damage to the body. The key to determining how good or bad the exercise is for the individual is whether there are feelings of compulsion that accompany the desire to exercise (McGinley, 1996).

Attitudes

A number of surveys have identified attitudes which are coincident with eating disorders in adolescent girls (e.g., fear of being fat and distortion of body image). Moore (1988) found that in 77% of average-weight girls and in 32% of very underweight girls, weight dissatisfaction was accompanied by weight-loss behavior. In adolescent girls who wish to lose weight, more than one-third did not have a realistic idea of how much to lose.

Gross & Rosen (1988) found no statistically significant group differences between bulimic girls and normal girls for socioeconomic status, race, or grade. However, other research indicated eating disorders occurred most often among young, white, affluent (upper-middle to upper class) women in modern, industrialized countries (Anderson & Hay, 1985; Hsu, 1989; Taub & McLorg, 1989).

The recent, dramatic increases in eating disorders have been postulated as resulting from the societal ideal of slimness for women and accompanying gender-based socialization that encourages adherence to traditional feminine gender norms (Boskind-White, 1985; Nasser, 1988; Rodin, Silberstein, & Gross, 1988; Schwartz, Thompson, & Johnson, 1982; Striegel-Moore, Silberstein, & Rodin, 1986). In American society, the standard is that a slim body is the most beautiful; being overweight is considered not only unhealthy but also unattractive (DeJong, 1980; Rittenbaugh, 1982; Schwartz, Thompson & Johnson, 1982).

Extreme dieting and exercise regiments among "normal" girls, as well as those with eating disorders, are seen as examples of dangerous attempts to attain the ideal of feminine beauty (Mazur, 1986). Garner & Garfinkel (1990) noted that a shift toward thinness in the American ideal for women coincided with an increase in dieting behavior.

In order to comply with the societal expectation of thinness, certain individuals use pathogenic weight control techniques (such as laxatives, vomiting, fasting, and diet aids) to reach an "ideal" weight. At the extreme, these methods can lead to disordered eating behaviors, including anorexia nervosa and bulimia nervosa.

Along with this emphasis on slimness, elements of gender-role orientation are associated with the development of eating disorders (Striegel-Moore, Silberstein & Rodin, 1986). For example, concern with thinness has been related to perceived and preferred femininity. In general, the more females diet and worry about weight, the more traditionally feminine they are in their actual and ideal gender-role orientations (Squires & Kagan, 1985).

Adolescence represents a particularly vulnerable period for the development of eating disorders. The most common ages of onset for anorexia nervosa (self-starvation) are early adolescence to early 20s (Leichner & Gertler, 1988), whereas the usual ages of onset for bulimia nervosa (binge-purge syndrome) are between 16 and 19 years (Mitchell & Pyle, 1988). Young females are especially susceptible to the development of eating disorders given the existence of a pervasive thinness norm (Mishkind, Rodin, Silberstein, & Streigel-Moore, 1986;

Polivy, Garner & Garfinkel, 1986) and a powerful peer subculture emphasizing conformity to appearance expectations (Gralen, Levine, Smolak, & Muren, 1990). In addition, bodily changes and weight gains associated with puberty are often causes of concern for adolescent females (Rosen & Gross, 1987).

Sports Impact

Because the incidence of anorexia nervosa and bulimia is so high among athletes, it has been suggested that sports may contribute to the development of these disorders (Zucker, Avener, & Boyder, 1985). Some researchers have speculated that the media's emphasis on physical fitness and leanness may promote preoccupation with low or extremely low body weight and may even result in the development of eating disorders. The attempts of athletes to be more appealing to their mentors by being thin, and their fears that they may not make the team if desired body weight is not achieved, are of great concern (Calabrese, Kirkendall, & Rapoports, 1983). The combination of social, biological, cultural, and cognitive variables, along with their unique and various components, have been presented as partial evidence to account for the progression of eating

disorders such as anorexia nervosa and bulimia nervosa (Garfinkel & Garner, 1983).

An individual's vulnerability to disordered eating behavior may relate to the nature of physical activities in which they participate. Individuals in organized forms of physical activity may be especially at risk as the structure and context of these activities possess the capability of imposing additional pressures and expectations on adolescent females (Gralen, Levin, Smolak, & Muren, 1990). In particular, organized physical activities that focus on the body or emphasize body shape and control may increase one's risk for exhibiting disordered eating behavior. Two common organized adolescent activities that emphasize the body, and thus may relate to eating and weight concerns, are sport participation and performance squad involvement (e.g., cheerleading).

Relative to sport participation, athletes may receive pressures from coaches, parents, and team members to reduce their body size or weight for competitive purposes. A high percentage of body fat is assumed to slow movement, hinder performance, and cause fatigue both in quickness and endurance activities (Davis & Cowles, 1989; Overdorf, 1987). Moreover, as the body often becomes the instrument for successful sport performance, attention is placed on an athlete's body shape, body

composition, and physical appearance (Hargreaves, 1987). Required to maintain exceptional control over their physique (Combs, 1982; Overdorf, 1987), athletes may resort to pathogenic weight control methods (e.g., induced vomiting, laxatives, diet aids) or other disordered eating behavior.

Another physical activity placing emphasis on body shape and size for adolescent females is performance squads. Including groups such as cheerleaders, performance squad members commonly experience pressures to maintain an aesthetically pleasing appearance (Humphries & Gruber, 1986; Lundholm & Littrell, 1986). In some instances, weekly weigh-ins, arbitrary weight standards, and visual inspection of team members in their uniforms are used to determine eligibility for these activities. Aspiring to meet appearance or body expectations, performance squad members may engage in various forms of disordered eating.

Research examining the relationship between involvement in performance squads and eating disorder tendencies is extremely limited. Among high school cheerleaders, binge-eating and purging behavior were reported, especially among those most desiring thinness (Lundholm & Littrell, 1986).

Although female athletes have been identified as a risk group for eating disorders, most research has concentrated on the intercollegiate or elite level athlete (Black & Burckes-Miller, 1988; Kurtzman, Yager, Landsverk, Wiesmeier, & Bodurka, 1989; Rosen, McKeag, Hough, & Curley, 1986; Warren, Stanton, & Blessing, 1990). Little focus, however, has been directed at female athletes participating in high school sport programs. The neglect of this age group is unfortunate as adolescence is the formative period for eating disorders (Leichner & Gertler, 1988; Mitchell & Pyle, 1988), and female college athletes also report that their disordered eating began at a younger age (Dummer, Rosen, Heusner, Roberts, & Counsilman, 1987).

High Risk Populations

Some female athletes--along with women in professions that demand special attention to personal appearance, such as flight attendants and fashion models--are particularly susceptible to eating disorders. According to the American College of Sports Medicine (ACSM), (Nattiv & Lynch, 1994), studies have shown the prevalence of disordered eating among female athletes to range from 15% to as high as 62%. In extreme cases of eating disorders, the mortality rate is 10% to 18% (Nattiv &

Lynch, 1994). Another study, (Johnson, Sanson, & Chewing, 1992), shows that female patients comprise 90% of reported cases of anorexia and the average age of onset is 16 years. Bulimia and anorexia sufferers are predominantly single, white, college-educated females from middle-to upper-class families (Johnson, & Tobin, 1991).

Research indicates that dancers, models, and athletes are among those possibly at high-risk for developing eating disorders. Within these "high-risk" populations, certain subgroups may be more vulnerable than their counterparts. Factors such as high level of competition and leanness being linked to success have been cited as possible predisposing factors for developing eating disorders (Garner & Garfinkel, 1990).

Many experts believe the world of high performance sports is a likely arena for the development of eating disorders. Studies have shown a positive correlation between amount of exercise and subjects displaying tendencies toward eating disorders (Crisp, Hsu, & Harding, 1980; Epling, Pierce, & Stefan, 1984; Richert & Hummers, 1986).

Even those athletes who have disordered eating but do not meet the strict DSM IV criteria for bulimia and anorexia risk developing endocrine, skeletal, and psychiatric problems, as well as full-blown eating disorders. Eating disorders, together with amenorrhea and osteoporosis, form what

a task force from the American College of Sports Medicine (ACSM) in Indianapolis refers to as the "female athlete triad" (Nattiv & Lynch, 1994).

This triad potentially threatens all adolescent and young adult female athletes, particularly elite-level athletes, the task force determined. This demand for optimal leanness for better athletic performance and the unrealistic cultural expectation to be thin combine to create strong pressures on many young athletes to reject and minimize body fatness. This negative attitude toward fatness is perpetuated by reinforcement commonly received from coaches, teammates, and parents. Athletes are often introduced to pathogenic methods of weight control such as purging and self-induced vomiting by well-meaning but unknowledgeable teammates and coaches (Combs, 1982; Henry, 1982; Smith, 1980; Zucker, Avener, & Boyder, 1985).

Athletes constitute an interesting group, given the paradoxical relationship between physical strength/stamina and the potentially debilitating effects of eating disorders. Several factors may account for athletes' propensity for eating disorders: (a) pressure from coaches, parents, and other participants to reduce body size for competition, (b) personality characteristics of athletes, and (c) emphasis placed on the body within the sport context.

Current experts' opinions are further split on the reasons for eating disorders among athletes. Research indicates the following: individuals with a predisposition toward eating disorders are attracted to certain "thin" types of sports (Henry, 1982; Zucker, Avener, & Boyder, 1985), the demand and expectations of competitive sport precipitates the onset of eating disorders (Borgen & Corbin, 1987; Garner & Garfinkel, 1990; Rosen, McKeag, Hough & Curley, 1986), or it is a combination of both that causes eating disorders in sports.

Chapter III

METHODOLOGY

Introduction

It is impossible to determine whether a person has anorexia, bulimia, or even exercise bulimia on the basis of a questionnaire. However, one can determine which young women may be predisposed to various eating disorders (Borgen & Corbin, 1987).

Subjects

The sample consisted of ninth through twelfth grade females attending a public high school in a medium-sized midwestern city. The high school, with an enrollment of 2,400 predominately White, middle class students, was situated in a city with the population of 86,000.

Those defined as athletes for the purpose of this study were track and field team members, soccer team members, gymnastic team members, and cheerleaders. All played on competitive school teams or were cheerleaders. Non-athlete subjects were defined as high school females who did not play on an athletic team or were not members of the cheerleading squad. Participation was completely voluntary.

The study comprised two groups of adolescent females totaling 58 subjects: 27 athletes and 31 non-athletes. Characteristics of the subject population are reflected in Table 1 (see page 18). The athlete subjects were all female and ranged in age from 15 to 18 years of age ($\underline{m}$ = 16.7), height ranged from 61-69.5 inches ($\underline{m}$ = 65.3), and current weight ranged from 97 - 150 pounds ($\underline{m}$ = 125.4). The non-athlete subjects ranged in age from 14 to 18 years of age ($\underline{m}$ = 16), height ranged from 61.5 - 69 inches ($\underline{m}$ - 65.2), and current weight ranged from 101 - 215 pounds ($\underline{m}$ = 127.7).

The educational level of the subjects were as follows: in the athlete group, 2 (8 percent) were seniors, 9 (33 percent) were juniors, 7 (26 percent) were sophomores, and 9 (33 percent) were freshmen. The non-athletic group comprised of 5 seniors (17 percent), 14 juniors (45 percent), 10 sophomores (31 percent), and 2 freshmen (7 percent).

Table 2 (see pages 19, 20) provides Individual Survey Information from the EDI - 2 Item Booklet regarding those subjects who participated in the study.

TABLE 1

DEMOGRAPHIC CHARACTERISTICS OF ATHLETES AND NON-ATHLETE SUBJECTS

	ATHLETES		NON-ATHLETES	
DESCRIPTION	X	RANGE	X	RANGE
Age (years)	16.7	15 - 18	16.0	14 - 18
Height (inches)	65.3	61.0-69.5	65.2	61.5-69.0
Current Weight (pounds)	125.4	97 - 150	127.7	101-215
Maximum High Weight (pounds)	128.3	100 - 170	133.8	103 - 195
Minimum Low Weight (pounds)	107.6	93 - 135	113.5	87 - 179
Maximum Loss (pounds)	9.7	2 - 40	12.0	2 - 40
Ideal Weight (pounds)	113	95 - 140	122	90 - 180

Athletes $\underline{n} = 27$

Non-Athletes $\underline{n} = 31$

TABLE 2

INDIVIDUAL SURVEY INFORMATION

EDI-2 ITEM BOOKLET

#	Age	Race	Hgt	Curr Wgt	High Wgt	Low Wgt	Wgt Loss	Max Loss	Loss 2	Ideal Wgt	Athlete
1	17	1	67	120	130	120	2	5	120	120	3
2	15	1	69.5	120	122	110	2	10	100	120	3
3	17	1	69	112	113	110	2	2	110	-1	3
4	16	1	66	150	170	120	1	40	120	120	3
5	16	1	61	135	-1	-1	-1	-1	-1	-1	3
6	16	1	66	128	133	120	1	5	120	120	3
7	16	1	65	118	-1	-1	-1	0	-1	100	3
8	14	3	60	97	100	93	2	7	100	95	2
9	17	1	67	113	115	110	2	5	110	113	2
10	18	1	65	135	135	120	2	10	120	130	2
11	14	1	64	125	130	100	2	5	130	115	2
12	15	1	65	127	130	120	1	7	123	120	1
13	15	1	62	135	137	125	1	5	130	140	1
14	14	1	64	120	130	110	1	5	115	110	1
15	16	1	65	135	137	130	1	3	133	125	1
16	17	1	61	130	135	110	2	15	115	115	1
17	16	1	68	143	143	-1	-1	-1	-1	135	1
18	15	1	67	130	135	115	1	7	120	120	1
19	17	1	64	145	-1	135	2	10	130	130	1
20	17	1	66	118	121	113	2	10	105	115	1
21	16	1	67	135	137	120	1	10	120	125	1
22	18	1	67	125	127	110	1	30	72	125	1
23	17	1	69	111	111	105	2	10	95	120	4
24	14	1	66	117	124	112	1	7	97	110	4
25	17	1	65.5	120	127	97	2	16	97	106	4
26	17	1	65	135	-1	120	-1	10	125	125	4
27	15	1	62	107	110	105	2	10	100	100	4
28	18	1	64	120	130	120	1	10	120	115	0
29	16	1	69	127	132	113	1	7	118	120	0
30	16	1	62	118	120	87	2	16	87	110	0
31	18	1	67	145	150	140	1	7	142	140	0
32	17	1	64	125	133	125	2	10	125	117	0
33	18	1	61.5	110	112	98	1	5	100	98	0
34	17	1	62	104	106	94	2	10	94	102	0

EDI-2 ITEM BOOKLET

#	Age	Race	Hgt	Curr Wgt	High Wgt	Low Wgt	Wgt Loss	Max Loss	Loss 2	Ideal Wgt	Athlete
35	16	1	66.5	125	130	125	1	5	125	125	0
36	17	1	62	115	115	108	2	3	108	105	0
37	16	1	64	168	180	150	1	30	150	130	0
38	16	1	62	106	106	92	2	30	100	100	0
39	16	1	68	125	130	-1	2	-1	-1	115	0
40	17	1	64	150	190	120	1	40	145	130	0
41	15	1	67	103	103	103	-1	-1	-1	100	0
42	17	1	68	125	130	118	1	10	120	120	0
43	17	1	67	120	125	120	2	5	120	120	0
44	17	1	64	101	110	94	1	12	95	98	0
45	17	1	69	155	164	148	1	10	148	140	0
46	17	1	62	125	138	123	2	10	125	115	0
47	16	1	60	105	126	94	1	28	98	90	0
48	17	1	64	116	120	114	2	2	-1	114	0
49	17	1	65	135	140	129	2	10	129	120	0
50	16	1	67	125	135	115	2	10	125	110	0
51	18	1	66	150	155	130	2	10	140	130	0
52	16	1	64	108	120	100	1	14	100	115	0
53	17	1	67	112	118	108	1	8	110	110	0
54	15	1	68	150	160	125	1	20	125	135	0
55	17	1	67	120	125	115	2	5	115	115	0
56	16	1	68	140	-1	-1	1	15	118	125	0
57	18	1	68	215	195	179	1	20	164	180	0
58	17	1	65	117	117	110	2	2	113	115	0

Averages:

											# Part.
A	16.00		65.30	125.4	128.3	107.6	1.4	9.7	106.6	113.0	27
N-A	16.71		65.23	127.7	133.8	113.5	1.467	12	112	122	31

A = Athlete
N-A = Non-Athlete

Race: 1 = White Caucasian
3 = Asian

# of Participants Column: 0 = Non-Athlete
1 = Soccer Athlete
2 = Track Athlete
3 = Cheerleader Athlete
4 = Gymnasts Athlete

Procedures

The procedures and data collection instrument of the study were reviewed and preapproved by the school's assistant principal, principal and district assistant director of curriculum.

Data was collected over a three day period by means of a questionnaire distributed during health classes and at the beginning of appropriate athletic practices (see Appendix A, page 50 for a sample of this questionnaire).

Initial contact was made with health teachers and coaches at the school who assumed responsibility for organizing the data collection process (see Appendix B, page 55 for this letter). The health classes, required for graduation, were chosen to represent the nonathletic participants. Cheerleading squads, girls soccer, track and gymnastics teams were chosen to represent the athletic participants. Coaches and teachers solicited volunteers from the appropriate classes and teams, allowing the first 20 volunteers from each athletic program and each health class to quality for the program, while maintaining a waiting list for the remainder.

All subjects were given a Parent Consent Form (see Appendix C, page 57) and Demographic Sheet (see Appendix D, page 59) stating that

"at risk" information gained from the EDI-2 would be shared with parents upon request. Otherwise information obtained from the study was confidential and would be presented in group form in the final published paper. One hundred (100) parent consent forms were distributed and fifty-eight (58) were returned, signed by parents.

The researcher emphasized that participation in the study was voluntary and that students could quit at any time. To help alleviate possible problems associated with classroom questionnaire administration and to decrease homogeneity of responses, students were separated from one another in their seating arrangement and asked not to talk with their classmates or to look at others' responses. It was announced that if an individual chose not to participate, she would remain seated and do independent work. Completion time for the questionnaire averaged 25 minutes.

Instrumentation

To measure the impact of sports participation on adolescent eating disorders, the Eating Disorder Inventory-2 (EDI-2), a widely used self-report measure of symptoms commonly associated with anorexia nervosa (AN) and bulimia nervosa (BN) was administered to 58 students

(see Appendix A, page 50). A standard EDI-2 Answer Sheet was used for the participants to record their responses to the questionnaire (see Appendix E, page 61).

The EDI-2 consists of the original EDI which is a 64-item, 6-point, Likert-type scale, with responses ranging from always to never (Garner, Olmsted, & Polivy, 1984). The current version of the EDI-2 retains the original 64 items and, with 27 additional items, adds three new constructs. The eight original subscales measured by the EDI-2 are: (1.) Drive for Thinness, (2.) Bulimia, (3.) Body Dissatisfaction, (4.) Ineffectiveness, (5.) Perfectionism, (6.) Interpersonal Distrust, (7.) Interoceptive Awareness, (8.) Maturity Fears, with three additional provisional subscales consisting of (9.) Asceticism, (10.) Impulse Regulation, and (11.) Social Insecurity. In subscales one, two, and three, attitudes and behaviors relative to eating and body shape are emphasized. In subscale four through eight, interpersonal issues and ego-functioning are the focus measures. The three remaining subscales are provisional scales. A glossary describing these eating disorder subscales is found in Appendix F, page 64.

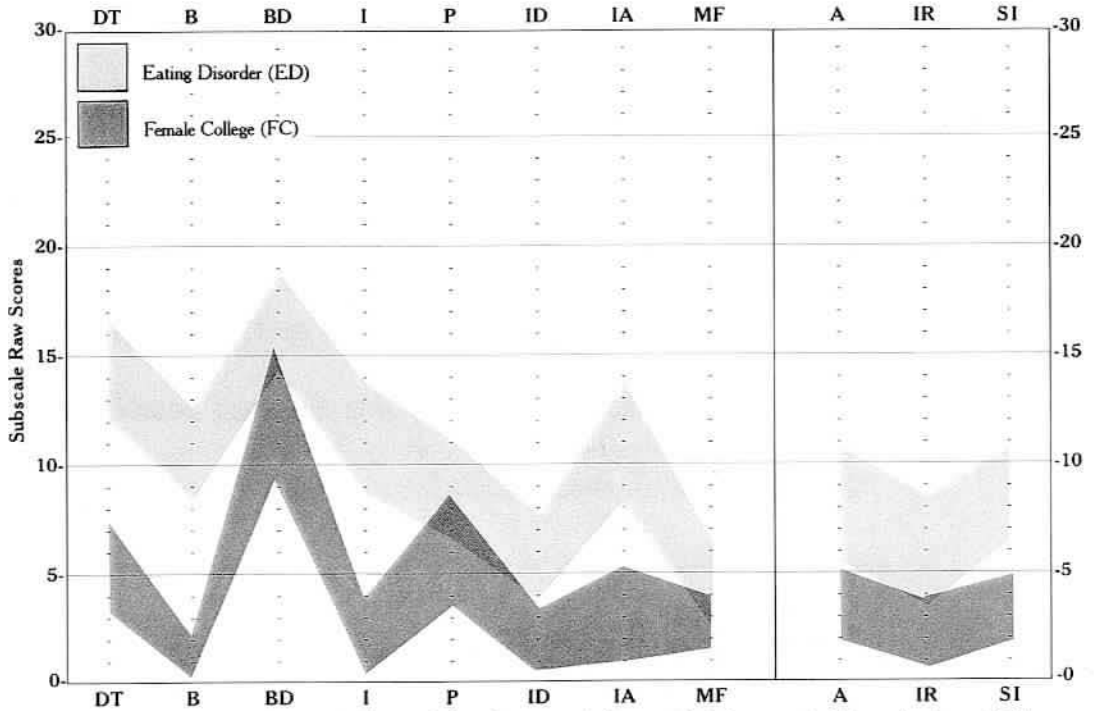
The manual reported that the clinical utilization of the inventory indicated that resulting scores were not only sensitive to "differentiation

of individuals who may have anorexia nervosa and bulimia nervosa" but those individuals who display "symptoms of a disorder but are less psychologically disturbed" (Garner & Olmsted, 1984, p. 10).

Internal consistency estimates for each subscale were reported by Garner, Olmsted, and Polivy (1984) as yielding a minimum .80 alpha coefficient. The validation of the Eating Disorder Inventory - 2 involved a criterion group of eating disordered females with a predominance of anorexic females over bulimic females. A comparison group consisted of female university students who were enrolled in psychology courses. Test items selected were those that significantly differentiated the eating disordered from the college sample and those that were highly correlated with only the subscale to which the items were cataloged. According to Garner, Olmsted, and Polivy (1984) the measure identified college women as weight preoccupied if their scores were at or above the mean (see Figure 1, the EDI-2 Profile Chart, page 25 showing the range for eating disorders and college females).

FIGURE 1
EDI-2 PROFILE FORM

Name _____ Age _____ Sex _____ Date _____



Raw Score _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

Percentile Score _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

Normative Group = Normative Table =

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Reliability and validity data for these two groups was reported in the Eating Disorder Inventory - Professional Manual (Garner, Olmsted & Polivy, 1983). The total correlation of the eight subscales was .63 (SD = .13). Reliability coefficients for the anorexia nervosa group (n = 155) ranged from .83 to .93 with a standard error of measurement across the subscales ranging from 1.9 to 2.9. Reliability coefficients for the female college students (n = 271) ranged from .72 to .92 with a standard error of measurement from 1.3 to 2.3 across the subscale.

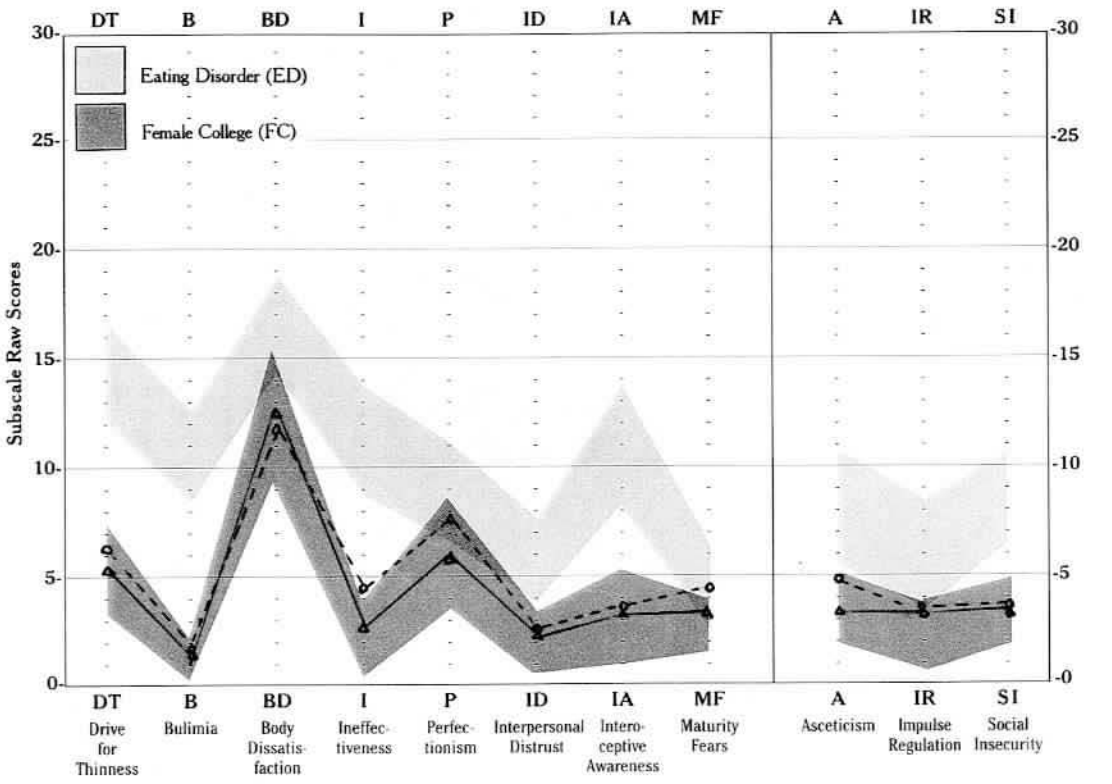
Observation for each subscale was plotted on a profile form to allow comparison with normative subscale scores for eating disorder and female university students (see Figure 2, page 27, 28). Elevated scores on subscales were an indication that an individual was possibly vulnerable for an eating disorder.

Used extensively by researchers, the EDI - 2 has been found to be both valid and reliable (Rosen, Silberg, & Gross, 1988). Shore and Porter (1990) indicated that the EDI "...has great potential as a screening instrument to detect young people particularly at risk for developing eating disorders or already in the early stages" (p. 206).

FIGURE 2

EDI-2 PROFILE FORM

Name _____ Age _____ Sex _____ Date _____



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Athlete = - - -o- - -

Non-Athlete = ——△——

FIGURE 2 (CONTINUED)

Sub-scale	Eating Disorder Range	Non-Athlete		Athlete	
		Raw Score	% Score	Raw Score	% Score
Drive for Thinness	12.0 - 16.5	5.2	47%	6.2	50%
Bulimia	8.5 - 13.0	1.5	58%	1.9	58%
Body Dissatisfaction	14.5 - 19.0	12.45	73%	11.85	73%
Ineffectiveness	9.0 - 14.0	2.7	49%	4.2	49%
Perfectionism *	6.5 - 11.0	5.74	62%	* 7.56	62%
Interpersonal Distrust	4.0 - 8.0	2.19	33%	2.44	33%
Interoceptive Awareness	8.0 - 13.5	3.29	55%	3.4	55%
Maturity Fears *	3.0 - 6.5	* 3.5	52%	* 4.2	52%
Asceticism	5.5 - 10.5	3.3	60%	4.8	60%
Impulse Regulation	4.0 - 8.5	3.35	77%	3.5	77%
Social Insecurity	6.5 - 11.0	3.12	66%	3.1	66%

* Falls within eating disorder range.

Chapter IV

RESULTS

To determine differences in disordered eating patterns among athletic teams, and students who were nonparticipants on athletic teams, 11 separate analyses of variance were employed to analyze responses onthe EDI - 2. The overall EDI - 2 score did not significantly vary among the two student groups. Mean scores on the overall EDI - 2 and its 11 subscales, along with the total number of females in grades 9 through 12, are shown in Figure 2, pages 27, 28. Across the two student groups, responses on the EDI - 2 total score and its subscales for the present sample were generally not significantly different from college age norms and were generally not within the eating disorder range. However, two EDI - 2 subscales did fall within the lower eating disorder range. These subscales were Maturity Fears which included both athlete and non-athlete and Perfectionism reflecting only athletes. Thus the present sample does not generally appear to be atypical for age norms for girls in grades 9 through 12.

To determine if there was a statistically significant difference between non-athlete and athlete, the mean and standard deviation on the

EDI-2 were computed for each of the samples. The delta index was used to calculate effect size as a measure of significance with an index of .05 considered statistically significant.

A total of 58 EDI-2 Profile questionnaires were returned by high school female students. These questionnaires were divided into two categories; non-athletes and athletes.

The 31 non athletes were high school students who did not participate in any organized sports teams. Their ages ranged from 15 years to 18 years with the average age of 16.71 years. Their height ranged from 60 inches to 69 inches with an average height of 65.23 inches. The weights of these students ranged from 101 pounds to 215 pounds with an average weight of 127.7 pounds. According to these students, their ideal weight ranged from 90 pounds to 180 pounds with an average ideal weight of 122 pounds. Another question identified the maximum number of pounds lost by these non-athletes. This ranged from 2 pounds to 40 pounds with an average of 12 pounds.

The 27 athletes consisted of 7 soccer players, 4 track participants, 11 cheerleaders, and 5 gymnasts. Their ages ranged from 14 years to 18 years with an average age of 16.0 years. Their height ranged from 60 inches to 69.5 inches with an average height of 65.3 inches. The weight

of these students ranged from 97 pounds to 150 pounds with an average weight of 125.4 pounds. The ideal weight cited by these same students ranged from 95 pounds to 140 pounds with an average ideal weight of 113. The maximum number of pounds lost by these student athletes ranged from 0 pounds to 40 pounds with an average of 9.7.

Figure 3 shows that there was not a significant difference between the non-athletes and athletes in any categories, including: age, height, weight, high weight, low weight, weight loss, maximum weight loss and ideal weight (see Figure 3 on page 32).

TABLE 2

INDIVIDUAL SURVEY INFORMATION

EDI-2 ITEM BOOKLET

#	Age	Race	Hgt	Curr Wgt	High Wgt	Low Wgt	Wgt Loss	Max Loss	Loss 2	Ideal Wgt	Athlete
1	17	1	67	120	130	120	2	5	120	120	3
2	15	1	69.5	120	122	110	2	10	100	120	3
3	17	1	69	112	113	110	2	2	110	-1	3
4	16	1	66	150	170	120	1	40	120	120	3
5	16	1	61	135	-1	-1	-1	-1	-1	-1	3
6	16	1	66	128	133	120	1	5	120	120	3
7	16	1	65	118	-1	-1	-1	0	-1	100	3
8	14	3	60	97	100	93	2	7	100	95	2
9	17	1	67	113	115	110	2	5	110	113	2
10	18	1	65	135	135	120	2	10	120	130	2
11	14	1	64	125	130	100	2	5	130	115	2
12	15	1	65	127	130	120	1	7	123	120	1
13	15	1	62	135	137	125	1	5	130	140	1
14	14	1	64	120	130	110	1	5	115	110	1
15	16	1	65	135	137	130	1	3	133	125	1
16	17	1	61	130	135	110	2	15	115	115	1
17	16	1	68	143	143	-1	-1	-1	-1	135	1
18	15	1	67	130	135	115	1	7	120	120	1
19	17	1	64	145	-1	135	2	10	130	130	1
20	17	1	66	118	121	113	2	10	105	115	1
21	16	1	67	135	137	120	1	10	120	125	1
22	18	1	67	125	127	110	1	30	72	125	1
23	17	1	69	111	111	105	2	10	95	120	4
24	14	1	66	117	124	112	1	7	97	110	4
25	17	1	65.5	120	127	97	2	16	97	106	4
26	17	1	65	135	-1	120	-1	10	125	125	4
27	15	1	62	107	110	105	2	10	100	100	4
28	18	1	64	120	130	120	1	10	120	115	0
29	16	1	69	127	132	113	1	7	118	120	0
30	16	1	62	118	120	87	2	16	87	110	0
31	18	1	67	145	150	140	1	7	142	140	0
32	17	1	64	125	133	125	2	10	125	117	0
33	18	1	61.5	110	112	98	1	5	100	98	0
34	17	1	62	104	106	94	2	10	94	102	0

EDI-2 ITEM BOOKLET

#	Age	Race	Hgt	Curr Wgt	High Wgt	Low Wgt	Wgt Loss	Max Loss	Loss 2	Ideal Wgt	Athlete
35	16	1	66.5	125	130	125	1	5	125	125	0
36	17	1	62	115	115	108	2	3	108	105	0
37	16	1	64	168	180	150	1	30	150	130	0
38	16	1	62	106	106	92	2	30	100	100	0
39	16	1	68	125	130	-1	2	-1	-1	115	0
40	17	1	64	150	190	120	1	40	145	130	0
41	15	1	67	103	103	103	-1	-1	-1	100	0
42	17	1	68	125	130	118	1	10	120	120	0
43	17	1	67	120	125	120	2	5	120	120	0
44	17	1	64	101	110	94	1	12	95	98	0
45	17	1	69	155	164	148	1	10	148	140	0
46	17	1	62	125	138	123	2	10	125	115	0
47	16	1	60	105	126	94	1	28	98	90	0
48	17	1	64	116	120	114	2	2	-1	114	0
49	17	1	65	135	140	129	2	10	129	120	0
50	16	1	67	125	135	115	2	10	125	110	0
51	18	1	66	150	155	130	2	10	140	130	0
52	16	1	64	108	120	100	1	14	100	115	0
53	17	1	67	112	118	108	1	8	110	110	0
54	15	1	68	150	160	125	1	20	125	135	0
55	17	1	67	120	125	115	2	5	115	115	0
56	16	1	68	140	-1	-1	1	15	118	125	0
57	18	1	68	215	195	179	1	20	164	180	0
58	17	1	65	117	117	110	2	2	113	115	0

Averages:											# Part.
A	16.00		65.30	125.4	128.3	107.6	1.4	9.7	106.6	113.0	27
N-A	16.71		65.23	127.7	133.8	113.5	1.467	12	112	122	31

A = Athlete
N-A = Non-Athlete

Race: 1 = White Caucasian
3 = Asian

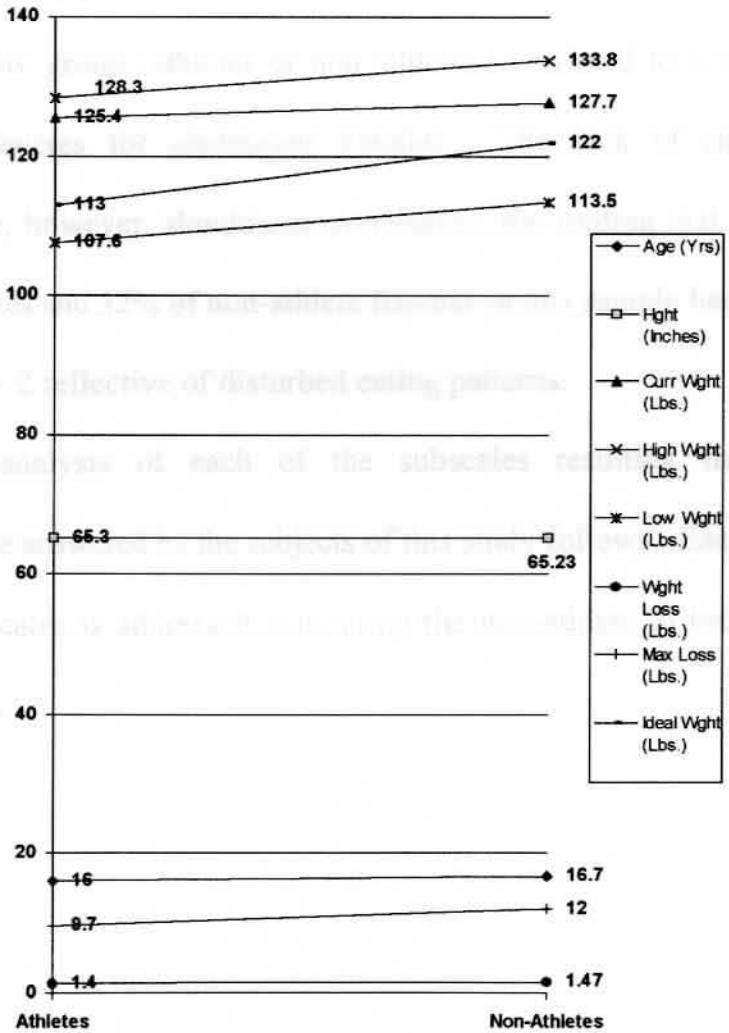
# of Participants Column: 0 = Non-Athlete
1 = Soccer Athlete
2 = Track Athlete
3 = Cheerleader Athlete
4 = Gymnasts Athlete

FIGURE 3

Average Participants Information

BY CATEGORY AVERAGES

Athlete Average Vs. Non-Athlete Average



Using the EDI-2 profile form, see Figure 2, page 27, identifying the various cut off scores and disturbed eating patterns (Garner & Garfinkel, 1990), it was apparent that the means for the two groups of students did not reflect a serious eating problem.

In summary, little evidence exists to indicate that membership in either activity group (athletes or non-athletes) is related to disordered eating tendencies for adolescent females. The lack of statistical significance, however, should not overshadow the finding that 39% of athlete females and 32% of non-athlete females in this sample had scores on the EDI - 2 reflective of disturbed eating patterns.

An analysis of each of the subscales resulting from the questionnaire answered by the subjects of this study follows. Each of the EDI-2 subscales is addressed comparing the non-athlete to the athlete participants.

Drive for Thinness

Drive for thinness is defined as a cardinal feature of anorexia nervosa. It is an ardent wish to lose weight and fear of weight gain. In comparing non-athletes and athletes there was no significant difference. The mean of the non-athletes sample (n=31) was 31 with a standard deviation of 5.231. The mean of the total athletes sample (n=27) was 6.222 with a standard deviation of 6.835 (see Table 3, below). Neither non-athletes 49% nor athletes 50% scored within the eating disorder range (12.0 - 16.5) but were consistent with the range of scores for college females (3.2 - 7.0), (see Figure 2, page 27).

TABLE 3

DRIVE FOR THINNESS

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	5.135	5.2310
Total Athletes	27	6.2222	6.8352

Bulimia

Bulimia (binging), the tendency to think about and engage in bouts of uncontrollable overeating, is helpful in distinguishing subtypes of anorexia nervosa. Bulimia has also been described in women with no history of anorexia nervosa. In comparing non-athletes and athletes, there was no significant difference. The mean of the non-athlete sample (n=31) was 1.5161 with a standard deviation of 2.365. The mean of the total athletes sample (n=27) was 1.926 with a standard deviation of 3.245, (see Table 4, below). Neither non-athlete 58% nor athlete 62% scored in the eating disorder range (8.5 - 13.0) but were consistent with the range of scores for college females (.50 - 2.1) (see Figure 2, page 27).

TABLE 4

BULIMIA

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	1.5161	2.3650
Total Athletes	27	1.9259	3.2450

Body Dissatisfaction

Body dissatisfaction is related to body-image distortions considered to be a basic deficit in anorexia nervosa. This subcategory scored the largest variance between non-athletes 71% and athletes 73%, but still did not fall within the eating disorder range (14.5 - 19.0) and was consistent with college females (9.0 - 15.0). The mean of the non-athlete sample (n=31) was 12.451 with a standard deviation of 7.999. The mean of the athlete sample (n=27) was 11.851 with a standard deviation of 10.193, (see Table 5, below). This subscale is plotted on Figure 2, page 27.

TABLE 5

BODY DISSATISFACTION

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	12.4510	7.9990
Total Athletes	27	11.851	10.193

Ineffectiveness

Ineffectiveness assesses feelings of general inadequacy, insecurity, worthlessness, and lack of control on one's life, a feature described as the fundamental disturbance in anorexia nervosa. In comparing non-athletes and athletes there was no significant difference. The mean of the non-athlete sample (n=31) was 2.7419, with a standard deviation of 5.428. The mean of the total athletes sample (n=27) was 4.22 with a standard deviation of 5.886. (See Table 6, below). Neither non-athletes 49% nor athletes 66% were within the eating disorder range (9.0 - 14.), but a greater variance existed between non-athletes and athletes. The athletes were slightly above the range for college females and slightly in the eating disorder range (1.0 - 4.0), (see Figure 2, page 27).

TABLE 6

INEFFECTIVENESS

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	2.7419	5.4280
Total Athletes	27	4.2200	5.8860

Perfectionism

Perfectionism is a characteristic theme in anorexia nervosa and is often associated with a dichotomous cognitive style. In comparing non-athletes and athletes there was no significant difference. The mean of the non-athlete sample (n=31) was 5.7409, with a standard deviation of 4.796. The mean of the total athletes sample (n=27) was 7.556 with a standard deviation of 4.644, (see Table 7, below). Non-athletes scored well within the range of female college students at 62%, but there was a 14% or a raw score of 1.82 gap between non-athletes and athletes. The athletes scored on the low end of the eating disorder range with a percentage score of 76% and a raw score of 5.79. Both were still within the college females range (3.75 - 8.0), however, the athletes score overlapped into the eating disorder range (6.5 - 11.0), (see Figure 2, page 27).

TABLE 7

PERFECTIONISM

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	5.7409	4.7960
Total Athletes	27	7.5556	4.6440

Interpersonal Distrust

Interpersonal distrust is an individual's general feeling of alienation and reluctance to form closer relationships. It involves measurement of the person's reluctance to express thoughts or feelings to others. In comparing non-athletes and athletes there was no significant difference. The mean of the non-athlete sample (n=31) was 2.1935, with a standard deviation of 2.822. The mean of the total athletes sample (n=27) was 2.4444 with a standard deviation of 3.154, (see Table 8, below). Neither non-athletes (33%) nor athletes (38%) scored within the eating disorder range (4.0 - 8.0), but both scored within the range for college females (1.0 - 3.0), (see Figure 2, page 27).

TABLE 8

INTERPERSONAL DISTRUST

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	2.1935	2.8220
Total Athletes	27	2.4444	3.1540

Interoceptive Awareness

Interoceptive awareness measures confusion and apprehension in recognizing and accurately responding to emotional states. It also taps uncertainty in the identification of certain visceral sensations related to hunger and satiety. In comparing non-athletes and athletes there was no significant difference. The mean of the non-athlete sample (n=31) was 3.2903, with a standard deviation of 5.008. The mean of the total athletes sample (n=27) was 3.4707 with a standard deviation of 4.227, (see Table 9, below). Neither non-athletes (55%) nor athletes (57%) scored within the eating disorder range (8.0 13.5), but both scored within the range for female college students (1.0 - 5.0), (see Figure 2, page 27).

TABLE 9

INTEROCEPTIVE AWARENESS

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	3.2903	5.0080
Total Athletes	27	3.4074	4.2270

Maturity Fears

Maturity fears has been described as the central psychopathology in anorexia nervosa. It assesses the desire to retreat to the security of childhood. The mean of the non-athlete sample (n=31) was 3.5161, with a standard deviation of 3.855. The mean of the total athletes sample (n=27) was 4.2963 with a standard deviation of 3.593, (see Table 10, below). Both non-athletes (52%) and athletes (61%) were within the eating disorder range (3.0 - 6.5), however, only the non-athletes scored within the college females range (1.5 - 4.0). This is an area of concern for both non-athletes and athletes at the high school level, (see Figure 2, page 27).

TABLE 10

MATURITY FEARS

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	3.5161	3.8550
Total Athletes	27	4.2963	3.5930

Asceticism

Asceticism measures the tendency to seek virtue through the pursuit of spiritual ideals such as self-discipline, self-denial, self-restraint, self-sacrifice, and control of bodily urges. The mean of the non-athlete sample (n=31) was 3.2581, with a standard deviation of 2.294. The mean of the total athletes sample (n=27) was 4.8148 with a standard deviation of 3.1380, (see Table 11, below). Neither non-athletes (78%) nor athletes (60%) were within the eating disorder range (5.5 - 10.5), but both were within the college females range (2.0 - 5.0), (see Figure 2, page 27).

TABLE 11

ASCETICISM

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	3.2581	2.2940
Total Athletes	27	4.8148	3.1380

Impulsive Regulation

Impulsive regulation assess the tendency toward impulsivity, substance abuse, recklessness, hostility, destructiveness in interpersonal relationships, and self-destructiveness. The mean of the non-athlete sample (n=31) was 3.3548, with a standard deviation of 4.128. The mean of the total athletes sample (n=27) was 5.5185 with a standard deviation of 4.552, (see Table 12, below). Neither non-athletes (77%) nor athletes (76%) scored within the eating disorder range (4.0 - 8.5), but both were close. Both non-athletes and athletes scored at the top of the range for the college females (2.0 - 4.0), (see Figure 2, page 27).

TABLE 12

IMPULSE REGULATION

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	3.3548	4.1280
Total Athletes	27	5.5185	4.5520

Social Insecurity

Social insecurity measures the belief that social relationships are tense, insecure, disappointing, unrewarding, and generally of poor quality. The mean of the non-athlete sample (n=31) was 3.1290, with a standard deviation of 3.2630. The mean of the total athletes sample (n=27) was 3.1481 with a standard deviation of 3.6130, (see Table 13, below). Neither non-athletes (60%) nor athletes (68%) scored in the eating disorder range (6.5 - 11.0) but did score within the range of college females (2.0 - 4.75), (see Figure 2, page 27).

TABLE 13

SOCIAL INSECURITY

Category	# of Cases	Mean	Std. Dev.
Non-Athletes	31	3.1290	3.2630
Total Athletes	27	3.1481	3.6130

Chapter V

DISCUSSION

Discussion of Results

Past research identified adolescents as a vulnerable group for the development of eating disorders but has targeted specific populations as most susceptible. Among high risk groups are females and individuals engaged in sports activities that focus on the body (Black Burckes-Miller, 1988; Brooks-Gunn, Burrow, & Warren, 1988; Humphries & Gruber, 1986; Lundholm & Littrell, 1986; Warren, Stanton, & Blessing, 1990). Given these previously found patterns, most of which focused on college-age women, it was hypothesized that adolescent females participating on sport teams would be at greater risk for disordered eating than would nonparticipants on sport teams.

Results from this study did not generally support the hypothesized relationships. High school females participating on sport teams were no more at risk for disordered eating patterns than their classmates who did not participate in these activities. These results suggest that athletics roles may not be so central as to dictate decisions such as eating behavior. Given the multiple roles with which adolescents identify (e.g., family,

peer, student), athletes are not defined solely by their physical activity role.

As previous research on eating disorders has concentrated primarily on the college female, it may be possible that the athlete becomes increasingly salient in highly competitive and stressful sport or activity contexts. As argued by Stryker and Serpe (1982), the more salient a role is to the individual, the more likely expectations associated with the role will guide behavior in a variety of situations. Other factors may account for the lack of significant findings relative to organized physical activity involvement in these high school females. At this level, athletes may not receive intense pressures from coaches to maintain a certain level of weight. Moreover, high school coaches may not have the same degree of control or influence over participants as do supervisors at the college level.

Even though athletic status did not differentiate those students most vulnerable, these adolescent females remain a risk population for disordered eating. The EDI - 2 scores in some subscales are a cause for concern. For example, 39% of students in this sample had EDI - 2 scores reflective of disturbed eating patterns.

Such results suggest that disordered eating tendencies, rather than being associated with certain organized physical activities, are distributed throughout the population of female adolescents. A focus on physical appearance and the body does not appear limited to athletes. Rather, a multitude of factors encourage emphasis on body size during adolescence (Hsu, 1989). Gender-role socialization prescribing a thin body and the accompanying peer pressure to conform to appearance expectations direct attention to one's physique (Gralen, Levine, Smolak, & Muren, 1990). Moreover, changes associated with puberty increase concern for weight and body distribution among adolescent females (Rosen & Gross, 1987). This preoccupation with the body occurs during a time period when adolescents often feel a lack of control in their lives (Hsu, 1989). Thus one way through which adolescents can gain self-autonomy is by controlling their bodies through disordered eating.

As adolescent females are at risk for eating disorders, high school personnel should be educated about its etiology and symptoms. In particular, school nurses, counselors, psychologists, and teachers should be aware of community resources for student referral. Information about eating disorders and the harmful effects of improper weight loss methods should be included in the health and physical education curricula.

Limitations

Before concluding that adolescent athletes are not risk groups for eating disorders, further research is needed. The present study was based on one school within a specific geographical, social, and ethnic context. In addition, the high school sport teams used in this study may not include the full range of sport activities in a high school setting. For example, other high school sport teams, including swimming, diving, and pommers, might impose different body and weight standards that impact vulnerability to eating disorders. Moreover, the length of time individuals have participated in their sport may influence eating behavior and thus should be included in future research. Competitiveness of sport programs can vary from school to school and thus affect prevalence of eating disorders.

Future Research

Additional research is needed to enhance understanding of a problem termed epidemic among females (Gordon, 1990). Although the EDI - 2 was used in the present study, other measures of eating disorders might uncover differences not observed with the current instrument. For example, the EAT (Garner, Olmsted, Bohr, & Garfinkel, 1982) and the

Restraint Scale (Herman & Mack, 1975) could be used to assess differences among adolescent female athletes, and students not engaged in these activities. Studies also should incorporate samples with a diverse range of ethnicity and social class groupings. Furthermore, the vast majority of what is known about anorexia nervosa and bulimia nervosa has been derived from questionnaires and standardized eating disorder inventories or from clinical populations. To comprehend the motives, meanings, and experiences of all adolescent females in terms of their eating attitudes and behavior, researchers should consider using in-depth interviews. Identifying unique features of the activity contexts that impact adolescents' decisions about body size, weight control, and body image may be useful in promoting changes that lessen the prevalence of disordered eating in this population. To compliment existing knowledge, the voices of adolescents themselves need to be heard.

APPENDIX A

APPENDIX A

EDI-2 ITEM BOOKLET

David M. Garner, Ph.D.

DIRECTIONS

Enter your name, the date, your age, sex, marital status, and occupation. Complete the questions on the rest of this page. Then turn to the inside of the booklet and carefully follow the instructions.

Name _____ Date _____

*Age _____ Sex _____ Marital status _____ Occupation _____

A. *Current weight: _____ pounds

B. *Height: _____ feet _____ inches

C. Highest past weight excluding pregnancy: _____ pounds

How long ago did you first reach this weight? _____ months

How long did you weigh this weight? _____ months

D. *Lowest weight as an adult: _____ pounds

How long ago did you first reach this weight? _____ months

How long did you weigh this weight? _____ months

E. What weight have you been at for the longest period of time? _____ pounds

At what age did you first reach this weight? _____ years old

F. If your weight has changed a lot over the years, is there a weight that you keep coming back to when you are not dieting? ___ Yes ___ No

If yes, what is this weight? _____ pounds

At what age did you first reach this weight? _____ years old

G. What is the most weight you have ever lost? _____ pounds

Did you lose this weight on purpose? ___ Yes ___ No

What weight did you lose to? _____ pounds

At what age did you reach this weight? _____ years old

H. What do you think your weight would be if you did not consciously try to control your weight? _____ pounds

I. How much would you like to weigh? _____ pounds

J. Age at which weight problems began (if any): _____ years old

K. Father's occupation: _____

L. Mother's occupation: _____

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9 8 7 6 5 4 3 2 1 This form is printed in blue ink on white paper. Any other version is unauthorized. Reorder #1761-TB. Printed in the U.S.A.

INSTRUCTIONS

First, write your name and the date on your EDI-2 Answer Sheet. Your ratings on the items below will be made on the EDI-2 Answer Sheet. The items ask about your attitudes, feelings, and behavior. Some of the items relate to food or eating. Other items ask about your feelings about yourself.

For each item, decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), or NEVER (N). Circle the letter that corresponds to your rating on the EDI-2 Answer Sheet. For example, if your rating for an item is OFTEN, you would circle the O for that item on the Answer Sheet.

Respond to all of the items, making sure that you circle the letter for the rating that is true about you. DO NOT ERASE! If you need to change an answer, make an "X" through the incorrect letter and then circle the correct one.

---

1. I eat sweets and carbohydrates without feeling nervous.
2. I think that my stomach is too big.
3. I wish that I could return to the security of childhood.
4. I eat when I am upset.
5. I stuff myself with food.
6. I wish that I could be younger.
7. I think about dieting.
8. I get frightened when my feelings are too strong.
9. I think that my thighs are too large.
10. I feel ineffective as a person.
11. I feel extremely guilty after overeating.
12. I think that my stomach is just the right size.
13. Only outstanding performance is good enough in my family.
14. The happiest time in life is when you are a child.
15. I am open about my feelings.
16. I am terrified of gaining weight.
17. I trust others.
18. I feel alone in the world.
19. I feel satisfied with the shape of my body.
20. I feel generally in control of things in my life.
21. I get confused about what emotion I am feeling.
22. I would rather be an adult than a child.
23. I can communicate with others easily.
24. I wish I were someone else.
25. I exaggerate or magnify the importance of weight.
26. I can clearly identify what emotion I am feeling.
27. I feel inadequate.
28. I have gone on eating binges where I felt that I could not stop.
29. As a child, I tried very hard to avoid disappointing my parents and teachers.
30. I have close relationships.
31. I like the shape of my buttocks.
32. I am preoccupied with the desire to be thinner.
33. I don't know what's going on inside me.
34. I have trouble expressing my emotions to others.
35. The demands of adulthood are too great.
36. I hate being less than best at things.
37. I feel secure about myself.

38. I think about bingeing (overeating).
39. I feel happy that I am not a child anymore.
40. I get confused as to whether or not I am hungry.
41. I have a low opinion of myself.
42. I feel that I can achieve my standards.
43. My parents have expected excellence of me.
44. I worry that my feelings will get out of control.
45. I think my hips are too big.
46. I eat moderately in front of others and stuff myself when they're gone.
47. I feel bloated after eating a normal meal.
48. I feel that people are happiest when they are children.
49. If I gain a pound, I worry that I will keep gaining.
50. I feel that I am a worthwhile person.
51. When I am upset, I don't know if I am sad, frightened, or angry.
52. I feel that I must do things perfectly or not do them at all.
53. I have the thought of trying to vomit in order to lose weight.
54. I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).
55. I think that my thighs are just the right size.
56. I feel empty inside (emotionally).
57. I can talk about personal thoughts or feelings.
58. The best years of your life are when you become an adult.
59. I think my buttocks are too large.
60. I have feelings I can't quite identify.
61. I eat or drink in secrecy.
62. I think that my hips are just the right size.
63. I have extremely high goals.
64. When I am upset, I worry that I will start eating.
65. People I really like end up disappointing me.
66. I am ashamed of my human weaknesses.
67. Other people would say that I am emotionally unstable.
68. I would like to be in total control of my bodily urges.
69. I feel relaxed in most group situations.
70. I say things impulsively that I regret having said.
71. I go out of my way to experience pleasure.
72. I have to be careful of my tendency to abuse drugs.
73. I am outgoing with most people.
74. I feel trapped in relationships.
75. Self-denial makes me feel stronger spiritually.
76. People understand my real problems.
77. I can't get strange thoughts out of my head.
78. Eating for pleasure is a sign of moral weakness.
79. I am prone to outbursts of anger or rage.
80. I feel that people give me the credit I deserve.
81. I have to be careful of my tendency to abuse alcohol.
82. I believe that relaxing is simply a waste of time.
83. Others would say that I get irritated easily.
84. I feel like I am losing out everywhere.

(Continued)

85. I experience marked mood shifts.
86. I am embarrassed by my bodily urges.
87. I would rather spend time by myself than with others.
88. Suffering makes you a better person.
89. I know that people love me.
90. I feel like I must hurt myself or others.
91. I feel that I really know who I am.

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APPENDIX B

APPENDIX B

Teacher Solicitation Letter

May 4, 1997

TO: Hogan
Ruff
Merritt
Cofer
Zang
Hanke
McClintock
Eagen

FROM: Joyce Barker, Guidance

RE: Research Project

I need your help to complete research for my graduate thesis. I am researching eating disorders in adolescent female athletes compared to adolescent female non-athletes.

I have targeted four areas to solicit volunteers for my research. These areas include: Girls soccer team, girls track team, cheerleaders, and health classes. I need to meet with you briefly Wednesday morning, May 7 at 7:00 a.m. in the guidance conference room to discuss the process.

If you cannot attend the meeting Wednesday morning, please drop by sometime Wednesday or Thursday and I'll explain my research proposal to you.

Thank you for your help on this very important project.

APPENDIX C

APPENDIX C

PARENT AND STUDENT
CONSENT TO PARTICIPATE IN RESEARCH

Parents, allow me to introduce myself. I am Joyce Barker, a part-time counselor at Francis Howell North High School, working toward my Master's Degree in Counseling from Lindenwood College.

I am requesting your permission to allow your daughter to participate in a survey for my graduate thesis. With your permission, your daughter will be administered the EDI (Eating Disorder Inventory). This testing instrument focuses on attitudes and behaviors regarding eating patterns and weight.

All participants will remain anonymous. Information obtained will be treated confidentially. However, upon request, specific information regarding your child will be supplied to you.

I have read and understand the above condition. I _____ _____, parent and/or legal guardian of _____, do hereby give my permission for Joyce Barker to administer the EDI to my daughter. I further give my permission for information gathered from that test to be published anonymously as group data in Mrs. Barker's Master's thesis.

I, _____, a student at Francis Howell North High School, understand the terms as stated above, and agree to participate in a study that requires me to take the **"Eating Disorder Inventory."** I further agree if information gained from that inventory categories me at risk, Mrs. Barker will contact my parents and discuss results specific to me.

_____ _____

Parent Signature *Date*

_____ _____

Student Signature *Date*

APPENDIX D

APPENDIX D

Demographic Survey

Name_____ Birth Date _____

Ethnic Background: Caucasian _____ Black _____ Hispanic _____

Asian _____ Native American _____ Other _____

Height _____ Weight _____

Are you currently participating in competitive* sports? Yes___ No___

If yes, list sport(s) _____

Have you participated in competitive* sports in the last two years?

Yes___ No___ If yes, please list sport(s) _____

_____

Person(s) who influenced you the most to participate in competitive* sports? _____

List other members of your family who have been or are currently participating in competitive sports. _____

_____

* **competitive sports:** a member of a team that competes with other teams for sports recognition.

APPENDIX E

APPENDIX E
EDI-2 ANSWER SHEET

David M. Garner, PhD

Name _____ Date _____

Fill in your name and the date above. Follow the Instructions in the EDI-2 Item Booklet and enter your ratings on this sheet.

A = ALWAYS U = USUALLY O = OFTEN S = SOMETIMES R = RARELY N = NEVER

1	A U O S R N	20	A U O S R N	39	A U O S R N	58	A U O S R N	76	A U O S R N
2	A U O S R N	21	A U O S R N	40	A U O S R N	59	A U O S R N	77	A U O S R N
3	A U O S R N	22	A U O S R N	41	A U O S R N	60	A U O S R N	78	A U O S R N
4	A U O S R N	23	A U O S R N	42	A U O S R N	61	A U O S R N	79	A U O S R N
5	A U O S R N	24	A U O S R N	43	A U O S R N	62	A U O S R N	80	A U O S R N
6	A U O S R N	25	A U O S R N	44	A U O S R N	63	A U O S R N	81	A U O S R N
7	A U O S R N	26	A U O S R N	45	A U O S R N	64	A U O S R N	82	A U O S R N
8	A U O S R N	27	A U O S R N	46	A U O S R N			83	A U O S R N
9	A U O S R N	28	A U O S R N	47	A U O S R N	65	A U O S R N	84	A U O S R N
10	A U O S R N	29	A U O S R N	48	A U O S R N	66	A U O S R N	85	A U O S R N
11	A U O S R N	30	A U O S R N	49	A U O S R N	67	A U O S R N	86	A U O S R N
12	A U O S R N	31	A U O S R N	50	A U O S R N	68	A U O S R N	87	A U O S R N
13	A U O S R N	32	A U O S R N	51	A U O S R N	69	A U O S R N	88	A U O S R N
14	A U O S R N	33	A U O S R N	52	A U O S R N	70	A U O S R N	89	A U O S R N
15	A U O S R N	34	A U O S R N	53	A U O S R N	71	A U O S R N	90	A U O S R N
16	A U O S R N	35	A U O S R N	54	A U O S R N	72	A U O S R N	91	A U O S R N
17	A U O S R N	36	A U O S R N	55	A U O S R N	73	A U O S R N		
18	A U O S R N	37	A U O S R N	56	A U O S R N	74	A U O S R N		
19	A U O S R N	38	A U O S R N	57	A U O S R N	75	A U O S R N		

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EDI-2 ANSWER SHEET

David M. Garner, PhD

Name _____ Date _____

Each item is identified by scale. Total the item scores for each subscale to arrive at a subscale raw score and enter this value in the space provided at the bottom of the answer sheet.

DT	0 0 0 1 2 3	I	0 0 0 1 2 3	MF	0 0 0 1 2 3	MF	0 0 0 1 2 3	SI	0 0 0 1 2 3
BD	3 2 1 0 0 0	IA	3 2 1 0 0 0	IA	3 2 1 0 0 0	BD	3 2 1 0 0 0	IR	3 2 1 0 0 0
MF	3 2 1 0 0 0	MF	0 0 0 1 2 3	I	3 2 1 0 0 0	IA	3 2 1 0 0 0	A	3 2 1 0 0 0
B	3 2 1 0 0 0	ID	0 0 0 1 2 3	I	0 0 0 1 2 3	B	3 2 1 0 0 0	IR	3 2 1 0 0 0
B	3 2 1 0 0 0	I	3 2 1 0 0 0	P	3 2 1 0 0 0	BD	0 0 0 1 2 3	SI	0 0 0 1 2 3
MF	3 2 1 0 0 0	DT	3 2 1 0 0 0	IA	3 2 1 0 0 0	P	3 2 1 0 0 0	IR	3 2 1 0 0 0
DT	3 2 1 0 0 0	IA	0 0 0 1 2 3	BD	3 2 1 0 0 0	IA	3 2 1 0 0 0	A	3 2 1 0 0 0
IA	3 2 1 0 0 0	I	3 2 1 0 0 0	B	3 2 1 0 0 0			IR	3 2 1 0 0 0
BD	3 2 1 0 0 0	B	3 2 1 0 0 0	IA	3 2 1 0 0 0	IR	3 2 1 0 0 0	SI	3 2 1 0 0 0
I	3 2 1 0 0 0	P	3 2 1 0 0 0	MF	3 2 1 0 0 0	A	3 2 1 0 0 0	IR	3 2 1 0 0 0
DT	3 2 1 0 0 0	ID	0 0 0 1 2 3	DT	3 2 1 0 0 0	IR	3 2 1 0 0 0	A	3 2 1 0 0 0
BD	0 0 0 1 2 3	BD	0 0 0 1 2 3	I	0 0 0 1 2 3	A	3 2 1 0 0 0	SI	3 2 1 0 0 0
P	3 2 1 0 0 0	DT	3 2 1 0 0 0	IA	3 2 1 0 0 0	SI	0 0 0 1 2 3	A	3 2 1 0 0 0
MF	3 2 1 0 0 0	IA	3 2 1 0 0 0	P	3 2 1 0 0 0	IR	3 2 1 0 0 0	SI	0 0 0 1 2 3
ID	0 0 0 1 2 3	ID	3 2 1 0 0 0	B	3 2 1 0 0 0	A	0 0 0 1 2 3	IR	3 2 1 0 0 0
DT	3 2 1 0 0 0	MF	3 2 1 0 0 0	ID	3 2 1 0 0 0	IR	3 2 1 0 0 0	SI	0 0 0 1 2 3
ID	0 0 0 1 2 3	P	3 2 1 0 0 0	BD	0 0 0 1 2 3	SI	0 0 0 1 2 3		
I	3 2 1 0 0 0	I	0 0 0 1 2 3	I	3 2 1 0 0 0	IR	3 2 1 0 0 0		
BD	0 0 0 1 2 3	B	3 2 1 0 0 0	ID	0 0 0 1 2 3	A	3 2 1 0 0 0		

	DT	B	BD	I	P	ID	IA	MF	A	IR	SI
Raw Score	____	____	____	____	____	____	____	____	____	____	____

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APPENDIX F

APPENDIX F

Eating Disorder Inventory Subscales

Attitude/Behavioral Subscales	
Drive for Thinness	A cardinal feature of anorexia nervosa. Items on this scale reflect an ardent wish to lose weight and fear of weight gain.
Bulimia	The Bulimia subscale assesses the tendencies to think about and to engage in bouts of uncontrollable overeating (bingeing). Helpful in distinguishing subtypes of anorexia nervosa. Bulimia has also been described in women with no history of anorexia nervosa.
Body Dissatisfaction	Related to body-image distortions considered to be a basic deficit in anorexia nervosa. This subscale measures dissatisfaction with the overall shape and with the size of those regions of the body that are of greatest concern to those with eating disorders (i.e., stomach, hips, thighs, buttocks). It is generally viewed as a major factor responsible for initiating and then sustaining the weight controlling behaviors of those with eating disorders.
Ineffectiveness	Assesses feelings of general inadequacy, insecurity, and lack of control on one's life--a feature described as the fundamental disturbance in anorexia nervosa.

Psychological Trait Subscales	
Perfection	This subscale measures the extent to which one believes that personal achievements should be superior. Items on the Perfectionism subscale measure that belief that only the highest standards of personal performance are acceptable and the belief that outstanding achievement is expected by others.
Interpersonal Distrust	This subscale assess an individual's general feeling of alienation and reluctance to form closer relationships. It also measures the person's reluctance to express thoughts or feelings to others. Has been identified as an important factor in the development and maintenance of anorexia nervosa.
Interoceptive Awareness	This subscale measures confusion and apprehension in recognizing and accurately responding to emotional states. It also taps uncertainty in the identification of certain visceral sensations related to hunger and satiety.
Maturity Fears	The maturity fears subscale assesses the desire to retreat to the security of childhood. Avoiding psychological maturity has been described as the central psychopathology in anorexia nervosa.

Provisional / Subscales	
Asceticism	This subscale measures the tendency to seek virtue through the pursuit of spiritual ideals such as self-discipline, self-denial, self-restraint, self-sacrifice, and control of bodily urges.
Impulse Regulation	The impulse regulation subscale assesses the tendency toward impulsivity, substance abuse, recklessness, hostility, destructiveness in interpersonal relationships, and self-destructiveness.
Social Insecurity	This subscale measures the belief that social relationships are tense, insecure, disappointing, unrewarding, and generally of quality.

*Source: Garner et al. 9

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