The Role of Social Physique Anxiety and Other Variables in Predicting Eating Behaviors in College Students

Lori M. Cox, Christopher D. Lantz, and Jerry L. Mayhew

Early identification of potentially harmful eating patterns is critical in the effective remediation of such behaviors. The purpose of this investigation was to examine the degree to which various factors including gender, family history, and athletic status predict disordered eating behavior; social physique anxiety and percent body fat were added as potential predictor variables. The eating behaviors of student-athletes and nonathlete students were also compared. One hundred eighty undergraduate students (males = 49, females = 131) provided demographic information and completed the Eating Attitudes Test (EAT) and the Social Physique Anxiety Scale (SPAS). Stepwise multiple-regression analysis indicated that social physique anxiety, gender, and body fat (%Fat) combined to predict 34% of disordered eating behaviors: EAT = 0.921 SPA – 1.05 %Fat + 10.95 Gender (1 = M, 2 = F) – 17.82 (R² = .34, SE = 4.68). A one-way ANOVA comparing the eating behaviors of athletes and nonathletes revealed no significant difference between these groups.

Key Words: eating disorders, self-presentation, prediction

Researchers have long been interested in assessing eating behavior patterns in a variety of populations. Studies have focused principally on disordered eating behavior in children (21), adolescents (17), and college students (2, 4). This research points to a strong relationship between eating behavior and such factors as gender, family history, and athletic status.

The most influential variable associated with the prevalence of disordered eating is gender. Research has consistently demonstrated a disproportionately high incidence of aberrant eating behavior among females (e.g., 1). Indeed, Thornton (18) and Worsnop (21) reported that 90% of all eating disorder cases involve females. Researchers have speculated that societal conditions encourage women to believe that in order to be attractive, they must be thin (e.g., 17, 19, 21). These social influences can lead to an obsession with

The authors are with the Department of Health and Exercise Science, Truman State University, Kirksville, MO 63501.
thinness, distorted body images, and strict and sometimes unhealthy eating behaviors.

Wichmann and Martin (19) suggested that additional risk factors in the prevalence of eating disorders are related to other social influences, particularly family history. Women who have a close, personal relationship with another individual (e.g., mother–daughter) who engages in disordered eating behaviors are often at increased risk themselves of developing such behaviors. Therefore, identifying the existence of eating disorders and aberrant dieting patterns in family and peers seems to be an important factor in determining whether an individual is at increased risk of developing a similar disorder.

Research evidence also suggests that eating disorders are prevalent in athletic populations, especially among females (e.g., 16, 18). Eating disorders are of special concern in sports emphasizing appearance (e.g., gymnastics, diving, and figure skating) or weight limitations (e.g., wrestling and boxing). Research has suggested that a disproportionate number of college student-athletes may suffer from eating disorders (12, 19). Moreover, Rosen et al. (15) reported that as many as 32% of college student-athletes, the majority of which are women, engage in disordered eating behavior. Participation in appearance-based sports, particularly at the collegiate level, may place additional pressures on female athletes to be thin, which may increase the likelihood of their resorting to drastic weight control measures such as disordered eating behavior. However, little research has examined the eating behaviors of student-athletes participating in non-appearance-based sports.

Although this body of research has provided valuable information on disordered eating behavior, further research is needed to explore additional factors that may influence disordered eating patterns in college students. One variable that warrants further consideration is social physique anxiety. Social physique anxiety (SPA) was first introduced by Hart et al. (7) and has been defined as a “subtype of social anxiety that occurs as a result of the prospect or presence of interpersonal evaluation involving one’s physique” (p. 94). The inclusion of SPA in this research is supported through previous research linking body image to disordered eating patterns. Hart et al. (7) provided evidence of a strong relationship between SPA and body image. It should be noted that although related, body image and SPA are conceptually distinct. While considerable attention has focused on people’s perceptions of and feelings about their own bodies (body image), little research has investigated individuals’ self-presentational concerns with how others perceive their physiques (SPA) and, more importantly, how these concerns relate to disordered eating behavior. This limited amount of research, however, has indicated that higher SPA scores positively correlate with scores on disordered eating assessment devices (e.g., Eating Disorders Inventory) (3, 7).

A second self-presentational variable that should be considered is body composition. Previous research suggests that individuals with high percentages of body fat are particularly prone to disturbed body images (7). However, the relationship between body composition and eating behaviors remains largely unexplored. Therefore, the purpose of this investigation was to examine the extent to which social physique anxiety and body composition, as well as gender, family history, and athletic status, predict the existence of disordered eating behaviors in college students. In addition, eating behaviors of student-athletes and nonathlete students were compared.
Methods

Participants

One hundred and eighty (males = 49, females = 131) undergraduate students from a small, Midwestern university served as participants (mean age 19.30, SD 2.41). Thirty-eight (21.1%) of the participants identified themselves as varsity student-athletes (SA) while 142 (78.9%) were nonathlete students (NAS). Nonathlete student participants were recruited from a university-required wellness course, while SA were recruited from meetings of the various sport teams including football (n = 7) and women's softball (n = 14), basketball (n = 8), soccer (n = 5), and volleyball (n = 4). By assessing only non-appearance-based sports, we obtained a measure of the influence of disordered eating behaviors in this population. In addition, the lack of appearance-based sports on the campus where data were collected made it impossible to obtain enough participants of this nature to adequately meet reasonable cell size requirements. Finally, 46 (25.6%) of the participants reported a family history of disordered eating behavior, while 132 (73.3%) indicated no such behavior. Approval for the study was granted by the Institutional Review Board for the Protection of Human Subjects.

Instrumentation and Assessments

Eating Attitudes Test (EAT). Eating behaviors of college students were assessed using the EAT (6), a 40-item self-report inventory that asks respondents to indicate the degree to which each of the 40 statements is characteristic or true of them. Respondents are required to judge whether the item applies to themselves very often, often, sometimes, rarely, or never. Each extreme response in the disordered eating direction is scored as 3 points, while the adjacent alternatives are weighted as 2 points and 1 point, respectively. No score is assigned for nondisordered eating responses. The numerical values are then summed to produce a total EAT score ranging from zero to 120. Higher scores on the EAT indicate those populations at higher risk of developing an eating disorder. Garner and Garfinkel (6) reported a variety of psychometric properties for the EAT including internal consistency (alpha = .94), convergent validity through a low correlation with the Restraint Scale (r = .28), and predictive validity.

Social Physique Anxiety Scale (SPAS). The SPAS is a 12-item self-report inventory designed to measure levels of social physique anxiety (7). Respondents are asked to indicate the degree to which each of the 12 statements is characteristic or true of themselves. Answers are based on a 5-point Likert-type scale (not at all, slightly, moderately, very, extremely) with numerical values of 1 to 5 assigned accordingly. The numerical values are then summed to produce a total SPAS score ranging from 12 (low SPAS) to 60 (high SPAS). Hart et al. (7) demonstrated construct validity of the SPAS through moderate correlations with measures that include fear of negative evaluation (r = .35) and body cathexis (r = -.51). Reliability of the SPAS was demonstrated (r = .82) in an 8-week test–retest format. The SPAS is also reported to be free from social desirability bias (r = .07) with the Social Desirability Scale. The SPAS has received considerable attention regarding its construct validity across a variety of populations (see 5, 11). Additional psychometric support is provided by Jackson et al. (8), who reported Cronbach alpha reliability indexes of .92 (females) and .92 (males), indicating high interitem reliability.
**Physiological Assessment.** Percent body fat was predicted from a gender-specific generalized equation (9, 10). Each participant was evaluated in triplicate at three skinfold sites, with the average of each site summed to estimate body density. The skinfold sites for males were the chest, abdomen, and thigh. The skinfold sites for females were the triceps, suprailiac, and thigh.

**Procedures**

**Psychological Assessment.** Permission was obtained from class instructors to assess NAS, and the coaches of the respective teams were contacted for permission to assess SA. Participants were provided an information sheet detailing the purpose of the study, and consent to participate was signified by their completion of the inventories. The inventories were administered to NAS in a wellness course during the lecture portion of the class. SA data were collected during team meetings. Presentation of the inventories was randomized in order to control for potential order effects; total time for completion of the inventories was approximately 15 min.

**Physiological Assessment.** NAS enrolled in the wellness course are required to participate in a physiological assessment lab where data including height, weight, flexibility, strength, and body fat are assessed. Percent body fat (%Fat) estimations from the lab were used in this study. %Fat for SA was assessed prior to a scheduled practice and was calculated using the same prediction equations as used in the wellness course.

**Results**

Descriptive statistics for the variables of interest including SPAS, EAT, and %Fat are presented in Table 1. In addition, the zero-order and partial correlations between SPA, EAT, and %Fat are presented in Table 2.

In order to determine the extent to which these variables predicted eating behaviors, stepwise multiple-regression analysis was performed. The results of this analysis indicated that SPA, F(1, 153) = 46.04, p < .0001, %Fat, F(2, 152) = 29.45, p < .0001, and gender, F(3, 151) = 25.73, p < .0001, combined to account for 34% of disordered eating behaviors: EAT = 0.921 SPA + 1.05 %Fat + 10.95 Gender (1 = M, 2 = F) - 17.82 (R² = .34, SE = 4.68). Further inspection of the data

<table>
<thead>
<tr>
<th>Table 1 Descriptive Statistics for the Eating Attitudes Test, Social Physique Anxiety Scale, and Percent Body Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EAT</strong></td>
</tr>
<tr>
<td><strong>M</strong></td>
</tr>
<tr>
<td>Nonathlete (n = 38)</td>
</tr>
<tr>
<td>Athlete (n = 142)</td>
</tr>
<tr>
<td>Males (n = 49)</td>
</tr>
<tr>
<td>Females (n = 131)</td>
</tr>
<tr>
<td>Total sample (N = 180)</td>
</tr>
</tbody>
</table>
Table 2  Zero-, First-, and Second-Order Partial Correlations of SPA, Gender, %Fat, and EAT Scores

<table>
<thead>
<tr>
<th></th>
<th>%Fat</th>
<th>SPA</th>
<th>Gender</th>
<th>EAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Fat</td>
<td>1.0</td>
<td>.51</td>
<td>.70</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>(.39)a</td>
<td>(.65)b</td>
<td>(-.38)c</td>
<td></td>
</tr>
<tr>
<td>SPA</td>
<td>1.0</td>
<td>.37</td>
<td>(.01)c</td>
<td>(-.17)d</td>
</tr>
<tr>
<td>Gender</td>
<td>1.0</td>
<td>.23</td>
<td>(.29)d</td>
<td></td>
</tr>
</tbody>
</table>

*aFirst order with gender held constant.  bFirst order with SPA held constant.  cFirst order with %Fat held constant.  dSecond order with %Fat, SPA and/or gender held constant.

revealed that SPA, %Fat, and gender contributed 50.5%, 33.5%, and 16%, respectively, of the variance accounted for in eating disorders.

A one-way ANOVA was used to determine the differences, if any, between SA and NAS scores on the EAT. This analysis demonstrated no significant differences in the eating behaviors of these two groups.

Discussion

The primary purpose of this study was to determine the extent to which a self-presentational factor such as social physique anxiety predicted disordered eating behaviors when combined with other factors including percent body fat, gender, family history, and athletic status. The combination of SPA, %Fat, and gender accounted for 34% of the explained variance in eating behavior. Of those factors, SPA was the major predictor of disordered eating behavior, with higher SPA scores associated with greater tendency toward disordered eating behavior. It should be noted that SPA, although related to body image, is conceptually distinct. Certainly, the relationship between eating disorders and distorted body image has been well established (13, 14). However, SPA is a relatively new construct and its relationship to important self-concept factors (e.g., eating disorders) is less clear. This investigation suggests that SPA may be an important variable in the prediction of disordered eating behaviors.

Percent fat was the second variable selected in the stepwise multiple-regression analysis. The negative regression coefficient indicated that those with lower %Fat values had a greater tendency toward disordered eating behaviors. Although the zero-order correlation between %Fat and eating disorders was not significant ($r = .04$), when the effect of SPA and gender was held constant by partial correlation (see Table 2), the correlation between %Fat and eating disorders became negative and significant ($r = -.38$). Thus, when the effect of SPA and gender was removed statistically, lower %Fat was related to higher eating disorder scores. This finding confirms the results of the regression analysis in light of the positive correlation between SPA and %Fat (see Table 2).
In addition, this research indicates that gender contributes a substantial amount to the common variance in eating disorders. When differences in %Fat and SPA were removed statistically, the correlation between gender and eating behaviors was positive and significant ($r = .29$). This confirms previous research (e.g., 1, 22) indicating that females report greater levels of disordered eating patterns. Interestingly, removing the effect of SPA from the relationship between gender and %Fat reduced the relationship only slightly. However, removing the influence of gender from the %Fat – SPA relationship reduced the correlation substantially. This indicates that regardless of gender, persons with higher %Fat are more likely to experience SPA than those with lower %Fat.

A secondary purpose of this study was to explore the differences in eating behaviors between SA and NAS. The results of this analysis did not indicate any differences between these two groups. While previous research has indicated that SA may report higher incidences of disordered eating behaviors than NAS (12, 19), these differences are most likely attributed to appearance-based sports (e.g., gymnastics, diving) or sports with weight restrictions (e.g., wrestling, cross-country running). Athletes in non-appearance-based sports may not be subjected to these same pressures. The data from this study suggest that SA in non-appearance-based sports are not at an increased risk for disordered eating behaviors when compared to NAS. There are several plausible explanations for this finding.

First, these results may be explained by the demographics of the SA themselves. The SA subjects were athletes who participated in non-appearance-based sports, such as male football players and female softball, basketball, and volleyball players. Second, disordered eating behaviors may not be as problematic for Division II SA as for their Division I counterparts. A final explanation may be found in the work of Petrie and Stoever (12) and Wilkins et al. (20), who found that SA did not differ significantly from NAS in their eating behaviors and that generally SA maintain a more positive body image and psychological well-being than NAS. Indeed, a comparison of SPA scores between SA ($M = 35.85$) and NAS ($M = 35.83$) from the current sample revealed that these groups were essentially identical. Certainly, additional research should be conducted to help confirm or reject these assertions by directly comparing SA from a variety of sports to NAS in an effort to determine if one of these groups represents an "at-risk" population. Furthermore, comparing SA from appearance-based sports with those from non-appearance-based sports may yield a greater understanding of the relationship between SPA and eating behaviors in the athletic population. Finally, authors of future research should attempt to identify additional variables (e.g., race) that may further identify individuals at risk of developing an eating disorder. In addition, research should consider larger, more diverse samples across a wider age range.

Petrie and Stoever (12) suggested that early identification of persons at risk of developing eating disorders would be an important step in reducing the frequency with which individuals engage in harmful eating behaviors and may ultimately prevent them from developing more severe eating disorders. In addition, identifying athletes exhibiting abnormal eating patterns may prevent development of the female athlete triad. This medical condition consists of disordered eating behaviors, amenorrhea, and osteoporosis (16, 22). Early identification may also help service providers implement effective educational strategies and interventions in a proactive manner, thus helping at-risk individuals to adopt safer, more effective weight management strategies. The results of this study suggest that SPA,
%Fat, and gender are important variables in identifying persons who are at risk of developing disordered eating behaviors.

References


*Manuscript received:* January 17, 1997

*Accepted for publication:* July 3, 1997