ISSN: 1309-0356

*Sharon R. Bratrud[1], Marissa M. Parmer[1], James R. Whitehead[1], Robert C. Eklund[2]*
*[1]Dept. Physical Education & Exercise Science, University of North Dakota*
*[2]Florida State University*
*james.whitehead@und.nodak.edu*

**ORIGINAL ARTICLE**

## SOCIAL PHYSIQUE ANXIETY, PHYSICAL SELF-PERCEPTIONS AND EATING DISORDER RISK: A TWO-SAMPLE STUDY

### Abstract

*We analyzed data from two independent samples to assess the predictive relationships between eating disorder risk (RISK) and physical self-esteem and social physique anxiety. Female college athletes completed the Physical Self-Perception Profile (PSPP), the Social Physique Anxiety Scale (SPAS), and the Drive For Thinness (THIN), Bulimia (BUL), and Body Dissatisfaction (BDIS) subscales of the Eating Disorder Inventory. They also completed socially desirability (SD) scales. Our analyses assessed the unique contribution of BDIS to risk prediction (THIN and BUL) after SD, SPAS and PSPP had been statistically controlled for. The associations between variables, and the predictive contributions of PSPP, SPAS, and BDIS to eating disorder risk as measured by THIN were similar in both studies. However, we found dissimilar results with regard to prediction of BUL. The $R^2$ shrinkage between studies suggests satisfactory cross validation with respect to predicting THIN, but not for the prediction of BUL. No scales were unduly prone to distortion by SD responding. These data support the hypothesis that PSPP and SPAS may contribute to predicting aspects of eating disorder risk, and further study of the contributions of PSPP and SPAS to eating disorder risk seems to be warranted.*

**Introduction**

In 1997, the American College of Sports Medicine (ACSM) first published a position stand on the Female Athlete Triad (i.e., disordered eating, amenorrhea, osteoporosis), and an updated version was published in 2007. These position stands stress that the Female Athlete Triad is a serious and relatively common syndrome warranting more attention by exercise and sport scientists. Thus, the need for more research in this area continues to be salient. Part of the ACSM position stand focused on the factors that contribute to the development of disordered eating/eating disorders. Many of those factors are psychosocial, and thus, are of interest to researchers in the areas of health and exercise and sport psychology.

Body dissatisfaction has been described as "a central feature" of eating disorders (Garner, 1991, Petrie and Greenleaf, 2007). Indeed, the hypothesis that body size and shape concerns strongly mediate eating disorder symptoms in female athletes was strongly supported in a study by Williamson et al. (1995). Specifically, their study examined how body size and shape concerns mediate three eating disorder-predictive factors; social influence for thinness, performance anxiety, and athletic self-appraisal.

While Williamson et al. (1995) found that those factors were related to the body size and shape concerns in a predictive relationship; our interest was with regard to assessment of the contribution of other factors that have been prominent recently in exercise psychology literature. Specifically, the constructs of physical self-esteem, and social physique anxiety were of interest—especially since logically, they seem to be conceptually related to body dissatisfaction. In turn, that apparent conceptual similarity raised the question of whether the body dissatisfaction, physical self-esteem, and social physique anxiety constructs have unique aspects related to eating disorder risk.

However, our searches of the literature indicated that these issues have only indirectly or partially been addressed in the last decade. For example, studies of NCAA athletes (Johnson, Powers and Dick, 1999; Johnson et al., 2004) cite lowered global self-esteem as a risk factor for a pathogenic drive for thinness in female athletes. Using a multidimensional measure of self-esteem, Burrows and Cooper (2002) also found self-esteem—especially physical appearance self-esteem to be significantly related to weight concerns associated with eating disorders in overweight pre-adolescent girls. Studying a sample of young females, Thompson and Chad (2002) found that social physique anxiety was a stronger predictor of body dissatisfaction and drive for thinness than body image. Our reviews revealed no studies that comprehensively researched the predictive contribution of social physique anxiety and physical self-perception subdomains to eating disorder risk.

An additional issue we considered is the extent to which the scales used to measure the constructs under study may be prone to conscious response distortion. Such threats to validity are occasionally considered. For example, Tilgner et al., (2004) reported that social desirability (SD) response bias was not a practically significant problem in adolescent girls' responses to body dissatisfaction, drive for thinness, and other eating disorder-related scales. However, most studies do not consider this validity-related issue, but one notable exception that we found was a study by Sonstroem and Potts (1996). Thus, following their method, we used the scores on SD scales (Paulhus, 1984; 1991) to statistically control for any response distortion effects on the unique contributions of physical self-esteem and social physique anxiety to the prediction of eating disorder risk.

Finally, we addressed the issue of the cross validation of predictive relationships from regression analyses of data from different convenience samples (Pedhazur, 1982). Specifically, we collected and analyzed two separate data samples to see if statistical "shrinkage" of the variance explained would occur.

**Method**

*Participants*

Two completely different samples were obtained. *Sample One* consisted of 75 female NCAA Division II athletes from one Midwestern University. Athletes from seven different sports (basketball, swimming, diving, track & field, cross country, volleyball, and softball volunteered to participate. *Sample two* consisted of 58 female NCAA Division II athletes from two similar Midwestern Universities. Athletes from five different sports (basketball, volleyball, cheerleading/dance, track & field, swimming/diving) volunteered to participate.

*Instrumentation*

*Eating Disorder Inventory (EDI) Scales*. Three subscales of the EDI-2 (Garner, 1991) were utilized to assess eating disorder risk. The EDI scales have been widely used, and data documenting their reliability and validity are summarized in a professional manual (Garner, 1991). The nine-item Body Dissatisfaction (BDIS) scale assessed dissatisfaction with the shape and size of the body and its parts. Body dissatisfaction is posited to be a major construct in the etiology of the weight controlling behaviors of those with eating disorders. The professional manual cites alpha reliability coefficients ranging from .91 to .93 for this scale.

The seven-item Drive for Thinness (THIN) scale assessed the extent to which participants' felt an intense drive to be thin and/or fear of fatness—which are central constructs in the understanding and diagnosis of eating disorders. The professional manual cites alpha reliability coefficients ranging from .81 to .91 for this scale.

The seven-item Bulimia (BUL) scale assessed the tendency of participants to think about, or to actually engage in the uncontrolled overeating that characterizes bulimia nervosa and some subtypes of anorexia. On each scale, respondents choose whether each item rates "always, usually, often, sometimes, rarely, or "never." Only the three responses most in the clinically or symptomatically relevant direction are scored. Thus each item can contribute 3, 2, 1, or zero points to the subscale score. The professional manual cites alpha reliability coefficients ranging from .69 to .83 for this scale.

*Physical Self-Perception Profile (PSPP)*. The PSPP (Fox and Corbin, 1989) contains five scales that measure physical aspects of self-esteem/worth. One assesses general physical self-worth (PSW), and the other four tap more specific perceptions of physical competence or adequacy—which were body attractiveness adequacy (BODY), sport/athletic competence (SPORT), physical condition adequacy (COND), and strength competence (STR). Each of the five scales contains six items in a structured alternative format that is designed to legitimize the four response choices of each item. Alpha coefficients in the range of .81 to .92 for the scales have been reported by the authors (Fox and Corbin, 1989).

*Social Physique Anxiety Scale (SPAS)*. The 12-item SPAS (Hart et al., 1989) assessed participants' social physique anxiety-their response anxiety to their perceptions of other people appraising their figure or physique. The version used was the one slightly modified by Eklund, Kelley and Wilson (1997) where item 2 of the inventory was reformatted from negative to positive wording because of psychometric concerns. Responses to each item are made on a 5-point Likert-type scale with verbal anchors ranging from "slightly" (1) to "extremely" (5). The SPAS has shown evidence of reliability (e.g., coefficient alpha = .90 in original study) and validity (e.g., see Eklund et al., 1997; MartinGinis et al., 2007).

*Balanced Inventory of Desirable Responding (BIDR)*. The BIDR (Paulhus, 1984; 1991) contains two scales that assess the impression management (IM) and self-deceptive enhancement (SDE) aspects of socially desirable (SD) response tendencies. IM items tap individuals' tendency to distort their self-presentation, and SDE items tap the tendency to give honest, but positively biased self-reports. Responses to the two scales are made on a 1-to-7 scale with "not true" and "very true" as the end points, and somewhat true" as the mid-point anchor. However, only extreme scores on each item (6 or 7) are scored, with each such score

being assigned one point. Thus, possible scores on each scale can range from zero to 20. Paulhus (1991) documented evidence of validity and reliability (alphas ranging from .70 to .82 for the SDE and .80 to .86 for the IM) for the scales. Sonstroem and Potts (1996) reported "marginally acceptable alphas in the .68 to .73 range.

### Procedures

With the permission of the team coaches for each sport, meetings were convened in which the study was explained to the athletes, informed consent was obtained, and the data were collected. Confidentiality and the right to decline participation were stressed. No coaches were present during these meetings. The studies were approved by the institutional review board.

### Design and Analysis

Initial analyses on each data set were conducted to provide descriptive statistics, and to ascertain the simple correlations between variables. Since the primary focus was on the unique contributions of social desirability, physical self-esteem, social physique anxiety, and body dissatisfaction to the prediction of eating disorder risk, hierarchical regression analyses were computed to investigate that aspect. IM and SDE were entered first in the hierarchical analyses so that the contribution of the other variables could be assessed after controlling for variance explained by social desirability. The PSPP scales were entered next. The four subscales (in the order SPORT, STR, COND, BODY) were entered before the global PSW scale. SPAS followed by BDIS were entered for one analysis, but just BDIS in another. Thus, the unique contributions of each could be determined while controlling for the variance explained by the previous variables entered. Finally, the data from sample two were used to cross validate the results from sample one. Specifically, using the protocol described by Pedhazur (1982), the $R^2$ statistics were compared as a measure of "shrinkage."

### Results

### Descriptive Statistics

Means, standard deviations, and alpha coefficients are displayed in Table 1. Using the normative ranges in the EDI-2 Manual Profile Form as a guide, 13.5% of sample one, and 12.3% of sample two scored in or above the eating disorder sample range on the Drive for Thinness scale, 1.3% and 3.5% respectively for Bulimia, and 28% and 17.5% respectively on the Body Dissatisfaction scale. The internal consistency (alpha coefficients) of the scales were essentially satisfactory except for the Physical Condition subscale of the PSPP which showed poor internal consistency in sample two ($\alpha$ = .55).

**Table 1.** Descriptive statistics and alpha reliability coefficients

| Variable | Sample One | | | | Sample Two | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Mean | *SD* | *α* | *n* | Mean | *SD* | *α* | *n* |
| Age | 19.68 | 1.35 | -- | 73 | 19.57 | .91 | -- | 42 |
| *Balanced Inventory of Desirable Responding* | | | | | | | | |
| Impression Management (IMP) | 5.64 | 3.53 | .75 | 73 | 5.79 | 2.81 | .61 | 56 |
| Self-Deceptive Enhancement (SDE) | 5.51 | 3.34 | .72 | 72 | 5.78 | 3.15 | .64 | 58 |
| *Eating Disorder Inventory* | | | | | | | | |
| Body Dissatisfaction (BDIS) | 9.68 | 6.98 | .81 | 75 | 7.98 | 6.56 | .89 | 57 |
| Bulimia (BUL) | 1.17 | 2.17 | .75 | 75 | 1.42 | 2.28 | .61 | 57 |
| Drive for Thinness (THIN) | 5.22 | 5.46 | .73 | 74 | 4.21 | 4.97 | .87 | 57 |
| *Social Physique Anxiety* (SPAS) | 3.10 | .75 | .85 | 75 | 2.88 | .77 | .91 | 58 |
| *Physical Self-Perception Profile* | | | | | | | | |
| Sport/Athletic Competence (SPORT) | 3.07 | .51 | .78 | 74 | 2.89 | .63 | .77 | 58 |
| Attractive Body (BODY) | 2.47 | .68 | .89 | 74 | 2.59 | .74 | .83 | 58 |
| Strength Competence/Adequacy (STR) | 3.11 | .47 | .86 | 73 | 3.00 | .7 | .83 | 58 |
| Physical Condition Competence/Adequacy (COND) | 3.20 | .55 | .86 | 74 | 3.20 | .44 | .55 | 58 |
| Physical Self-Worth (PSE) | 2.87 | .63 | .89 | 74 | 2.89 | .71 | .84 | 58 |

### *Correlation Analysis*

The intercorrelations between all scales are displayed in Table 2. With regard to SD, no scales were significantly correlated with IMP, but four scales (BUL, SPAS, BODY, PSW) were significantly associated with SDE. Three of those correlations were insubstantial (*r*'s from -.27 to .30), but the correlation with SPAS was larger (*r* = -.45. p < .001).

Noteworthy among the intercorrelations between PSPP subscales was the *r* = .80 (*p* < .001) between BODY and PSW. The correlations between BDIS, SPAS, BODY, and PSW were all substantial (*r*'s from .63 to -.79, all *p* < .001).

**Table 2.** Scale Intercorrelations by Sample

| | Sample | BUL | THIN | SPAS | SDE | IMP | SPORT | BODY | STR | COND | PSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BDIS | S1 | .21 | .73**** | .72**** | -.17 | -.15 | -.31**- | -.72**** | -.14 | -.37*** | -.64**** |
| | S2 | .09 | .72**** | .63**** | -.22 | -.10 | -.23 | -.67**** | -.14 | -.38*** | -.79**** |
| BUL | S1 | -- | .34*** | 0.14 | -.21 | -.27 | -.21 | -.12 | .13 | -.29* | -.25* |
| | S2 | -- | .30 | .36** | -.27* | -.22 | -.04 | -.23 | .02 | .07 | -.16 |
| THIN | S1 | | -- | .61**** | -.30* | -.19 | -.35*** | -.44**** | -.15 | -.24* | -.47**** |
| | S2 | | -- | .63**** | -.21 | -.15 | -.15 | -.49**** | -.10 | -.15 | -.51**** |
| SPAS | S1 | | | -- | -.22 | -.25* | -.25* | -.82**** | -.24* | -.49**** | -.76**** |
| | S2 | | | -- | -.45**** | -.10 | -.16 | -.75**** | -.26* | -.21 | -.69**** |
| SDE | S1 | | | | -- | .31** | .25* | 0.07 | .30* | .21 | .20 |
| | S2 | | | | -- | .24 | .02 | .28* | .10 | -.11 | .30* |
| IMP | S1 | | | | | -- | .02 | .01 | -.06 | .23 | .11 |
| | S2 | | | | | -- | -.11 | .10 | -.05 | -.03 | .07 |
| SPORT | S1 | | | | | | -- | .26* | .52**** | .61**** | .50**** |
| | S2 | | | | | | -- | .24 | .24 | .24 | .25 |
| BODY | S1 | | | | | | | -- | .28* | .51**** | .77**** |
| | S2 | | | | | | | -- | .30* | .40*** | .80**** |
| STR | S1 | | | | | | | | -- | .43**** | .45**** |
| | S2 | | | | | | | | -- | .38*** | .33* |
| COND | S1 | | | | | | | | | -- | .64**** |
| | S2 | | | | | | | | | -- | .36** |

*Note*. Sample 1 coefficients in shaded lines, Sample 2 coefficients in unshaded lines. BDIS = Body Dissatisfaction Scale; BUL = Bulimia Scale; THIN = Drive for Thinness Scale; SPAS = Social Physique Anxiety Scale; SDE = Self-Deceptive Enhancement Scale; IMP = Impression Management Scale; SPORT = Sport/Athletic Competence Scale; BODY = Attractive Body Scale; STR = Strength Competence/Adequacy Scale; COND = Physical Condition Competence/Adequacy Scale; PSW = Physical Self-Worth Scale.
\* = p < .05, \*\* = p < .01, \*\*\* = p< .005, \*\*\*\* = p < .001. All other coefficients are nonsignificant

### *Hierarchical Regression Analyses*

The initial hierarchical regression analyses (Table 3) showed statistical congruence between the first and second samples in the prediction of THIN, but not for BUL. Specifically, after controlling for SD, the PSPP scales explained 28% and 25% of the variance in THIN, with BDIS adding another 20% and 27% for totals of 48% and 51% respectively. In the first sample PSPP explained 22% of the variance in BUL, but this fell to 3% of the variance explained in the second sample. In both samples BDIS did not predict BUL.

In the second set of hierarchical regression analyses on samples one and two (Table 4) the order of variables entered was the same but SPAS was entered after the PSPP scales to assess its contribution. SPAS uniquely added 14% and 15% of unique variance explained in THIN, and BDIS then added a further 14% and 18% for totals of 56% and 58% of unique variance explained respectively after controlling for SD. However, SPAS did not predict BUL.

**Table 3.** Standardized Regression Coefficients and R squared Changes by PSPP and Body Dissatisfaction.

| Variable | Drive for Thinness | | | | | | Bulimia | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | | $\Delta R^2$ | | $p<$ | | $\beta$ | | $\Delta R^2$ | | $p<$ | |
| IMP | -.19 | -.15 | .03 | .02 | .13 | .28 | -.26 | -.22 | .07 | .05 | .03 | .11 |
| SDE | -.28 | -.15 | .07 | .02 | .03 | .30 | -.13 | -.21 | .02 | .04 | .31 | .14 |
| SPORT | -.29 | -.16 | .08 | .03 | .01 | .25 | -.16 | -.06 | .03 | .00 | .18 | .68 |
| STR | .16 | -.06 | .02 | .01 | .25 | .67 | .40 | .05 | .11 | .00 | .004 | .75 |
| COND | -.04 | -.15 | .00 | .02 | .78 | .32 | -.31 | .03 | .05 | .00 | .04 | .85 |
| BODY | -.48 | -.46 | .16 | .15 | .001 | .001 | .02 | -.20 | .00 | .03 | .87 | .21 |
| PSW | -.25 | -.34 | .02 | .04 | .21 | .12 | -.34 | .09 | .03 | .00 | .10 | .69 |
| BDIS | .71 | .91 | .20 | .27 | .001 | .001 | -.09 | -.13 | .00 | .01 | .62 | .59 |
| $R^2$ Total | | | .58 | .55 | | | | | .31 | .13 | | |

*Note.* Shaded coefficients are from the first sample, Unshaded coefficients are from the second sample. Scales: IMP = Impression Management Scale; SDE = Self-Deceptive Enhancement; SPORT = Sport/Athletic Competence Scale; STR = Strength Competence/Adequacy Scale; Scale; COND = Physical Condition Competence/Adequacy Scale; BODY = Attractive Body Scale; PSW = Physical Self-Worth Scale; BODDIS = Body Dissatisfaction Scale.

**Table 4.** Standardized Regression Coefficients and $R^2$ Changes by PSPP, Social Physique, Anxiety and Body Dissatisfaction

| Variable | Drive for Thinness | | | | | | Bulimia | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | | $\Delta R^2$ | | $p<$ | | $\beta$ | | $\Delta R^2$ | | $p<$ | |
| IMP | -.19 | -.15 | .03 | .02 | .13 | .28 | -.26 | -.22 | .07 | .05 | .03 | .11 |
| SDE | -.28 | -.15 | .07 | .02 | .03 | .30 | -.13 | -.21 | .02 | .04 | .31 | .14 |
| SPORT | -.29 | -.16 | .08 | .03 | .01 | .25 | -.16 | -.06 | .03 | .00 | .18 | .68 |
| STR | .16 | -.06 | .02 | .01 | .25 | .67 | .40 | .05 | .11 | .00 | .004 | .75 |
| COND | -.04 | -.15 | .00 | .02 | .78 | .32 | -.31 | .03 | .05 | .00 | .04 | .85 |
| BODY | -.48 | -.46 | .16 | .15 | .001 | .001 | .02 | -.20 | .00 | .03 | .87 | .21 |
| PSW | -.25 | -.34 | .02 | .04 | .21 | .12 | -.34 | .09 | .03 | .00 | .10 | .69 |
| SPAS | .74 | .63 | .14 | .15 | .001 | .001 | -.14 | .37 | .01 | .05 | .49 | .09 |
| BDIS | .61 | .78 | .14 | .18 | .001 | .001 | -.06 | -.27 | .00 | .02 | .72 | .28 |
| $R^2$ Total | | | .66 | .62 | | | | | .31 | .20 | | |

*Note.* Shaded coefficients are from the first sample, Unshaded coefficients are from the second sample. Scales: IMP = Impression Management Scale; SDE = Self-Deceptive Enhancement; SPORT = Sport/Athletic Competence Scale; STR = Strength Competence/Adequacy Scale; Scale; COND = Physical Condition Competence/Adequacy Scale; BODY = Attractive Body Scale; PSW = Physical Self-Worth Scale; SPAS = Social Physique Anxiety Scale; BDIS = Body Dissatisfaction Scale.

### Discussion

Since any response distortion would threaten the validity of the main findings, that issue was addressed as a first step in both data collections. Fortunately, the few significant (but insubstantial) correlations of PSPP, SPAS, BDIS, and BUL with SDE that were found suggest that these scales are unlikely to elicit marked socially desirable response tendencies. Indeed,

had a Bonferroni effect adjustment in alpha been made, only the correlation of SPAS with SDE would have reached statistical significance. Moreover, since SDE is the tendency to give honest, but inflated self-descriptions, low-to-moderate positive correlations with self-esteem are typical, and may be an indicator of healthy psychological adjustment (Paulhus, 1991). It has also been noted by Paulhus (1991) that the SDE scale usually correlates negatively with trait anxiety, social anxiety, and personal distress, and thus, it makes conceptual sense that it should correlate somewhat negatively with SPAS.

While a marked tendency of any scales to elicit any type of response distortion would be a threat to their validity, it seems fair to say that the results of this study did not signal significant cause for concern with respect to the validity of the PSPP, SPAS, BDIS, and BUL scales. Of course, it is also true that a preliminary study such as this certainly does not provide definitive evidence of robustness of these scales against SD tendencies.

Since cross validation of results was an important purpose of this study, the question of whether PSPP and SPAS significantly predicted eating disorder risk, and whether body dissatisfaction added uniquely to the prediction over and above those variables, was a central focus.

In the second sample, once again, the PSPP scales made a substantial contribution to the prediction of eating disorder risk as measured by THIN, but the results for BUL were not replicated. With regard to the prediction of THIN, in both samples SPAS added substantially to the prediction of THIN after controlling for SD and the five PSPP scales. Similarly, BDIS also added substantially to the prediction of THIN even after all the other variables had been entered. This suggests that despite the large simple correlations between some of these variables (e.g., between BODY, BDIS, and SPAS), they have unique aspects that are worthy of further study.

However, with regard to the cross validation of the results from the first sample, the results from the second sample suggest that the initial data on the prediction of BUL may have been an anomaly. However, the clear similarity in the prediction of THIN between both studies, and the minimal $R^2$ shrinkage, suggest confidence in the substance of the relationships (Pedhazur, 1982). Thus, given that BODY, and SPAS once again uniquely and substantively predicted THIN, their role in the etiology of eating disorders certainly seems worthy of further study.

Indeed, there would seem to be many possibilities given that the weight-related disorders that are common in athletes, are ubiquitous in contemporary society. Recently, an integrated approach to the "broader spectrum of weight-related problems" has been advocated (Neumark-Sztainer, 2005) and thus, the data from this study may be of some heuristic value in that regard.

In fact, hypothesized relations in predictive models have already been proposed (e.g., Irving and Neumak-Sztainer, 2002; Haines and Neumark-Sztainer, 2006). Thus, there would seem to be many possibilities for investigating the role of variables such as physical self-esteem, and social physique anxiety in interventions designed to impact weight-related problems. For example, it would be interesting to see if educational or public health interventions aimed at obesity, body image disturbances, and/or eating disorders directly affect outcomes, or whether any changes are mediated by effects on physical self-esteem and social physique anxiety.

In summary, the results of this study, while still preliminary in nature, suggest that it may be fruitful to continue to investigate the role of physical self-esteem variables, and social physique anxiety, as factors relevant to the understanding of the risk and development of eating disorders in athletes—especially as they relate to a pathological drive for thinness. There may also be considerable scope for investigation of the role of these variables in the etiology and the prevention of weight-related problems in society as a whole.

**References**

1. American College of Sports Medicine. (1997). The Female Athlete Triad. *Medicine and Science in Sports and Exercise, 29*, i-ix. http://www. ncbi.nlm. nih.gov/pubmed/9140913

2. American College of Sports Medicine. (2007). The Female Athlete Triad. *Medicine and Science in Sports and Exercise, 39*, 1867-1882. http:// www.ncbi. nlm.nih. gov/pubmed/17909417

3. Burrows, A., & Cooper, M. (2002). Possible risk factors in the development of eating disorders in overweight preadolescent girls. *International Journal of Obesity, 26*, 1268-1273. http://ezproxy. library.und.edu/login?url= http://search.ebscohost.com/login.aspx?direct=true&db=keh&AN=8674914&site=ehost-live&scope=site

4. Eklund, R.C., Kelley, B.E., & Wilson. P. (1997). The Social Physique Anxiety Scale: Men, women, and the effects of modifying item 2. *Journal of Sport & Exercise Psychology, 19*, 188-196.

5. Fox, K.R., & Corbin, C.B. (1989). The Physical Self-Perception Profile: Development and preliminary validation. *Journal of Sport & Exercise Psychology, 11*, 408-430.

6. Garner, D.M. (1991). *Eating Disorder Inventory-2 manual*. Odessa, FL: Psychological Assessment Resources, Inc.

7. Haines, J, & Neumark-Sztainer, D. (2006). Prevention of obesity and eating disorders: A consideration of shared risk factors. *Health Education Research, 21*, 770-782. http://her.oxfordjournals.org/cgi/content/full/21/6/770

8. Hart, E., Leary, M. & Rejeski, J. (1989). The measurement of social physique anxiety. *Journal of Sport and Exercise Psychology, 11*, 94-104.

9. Irving, L.M., & Neumark-Sztainer, D. (2002). Integrating the prevention of eating disorders and obesity: Feasible or futile? *Preventive Medicine, 34*, 299-309. http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6WPG-45FJW8S-1&_user=2386327&_coverDate=03%2F31%2F2002&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000057148&_version=1&_urlVersion=0&_userid=2386327&md5=eddc3c94601cbb2b47a61c8fb718719a

10. Johnson, C., Crosby, R., Engel, S., Mitchell, J., Powers, P., Wittrock, D., & Wonderlich, S. (2004). Gender, ethnicity, and disordered eating among college athletes. *Eating Behaviors, 5*, 147-156. http:// www. sciencedirect.com/science?_ob=ArticleURL&_udi=B6W77-4BRP2TN-5&_user=2386327&_coverDate=05%2F31%2F2004&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1416724992&_rerunOrigin=scholar.google&_acct=C000057148&_version=1&_urlVersion=0&_userid=2386327&md5=f8a6374465c06cdca7d40103d321c507

11. Johnson, C., Powers, P.S., & Dick, R. (1999). Athletes and eating disorders: The NCAA study. *International Journal of Eating Disorders, 26*, 179-188.

12. Martin Ginis, K.A., Lindwall, M., & Prapavessis, H. (2007). Who cares what other people think? Self-presentation in exercise and sport. In G. Tenenbaum & R.C. Eklund (Eds.), *Handbook of Sport Psychology* (3rd ed.; pp. 136-159). Hoboken, NJ: Wiley.

13. Neumark-Sztainer, D. (2005). Can we simultaneously work towards the prevention of obesity and eating disorders in children and adolescents? *International Journal of Eating Disorders, 38*, 220-227. http:// www. interscience. wiley.com/ journal/ 112100599/abstract?CRETRY=1&SRETRY=0

14. Paulhus, D.L. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology, 46*, 598-609.

15. Paulhus, D.L. (1991). *BIDR Reference Manual for Version 6*. Vancouver, BC: University of British Columbia.

16. Pedhazur, E.J. (1982). *Multiple regression in behavioral research*. New York: Holt, Rinehart and Winston.

*17.* Petrie, T.A. & Greenleaf, C.A. (2007). Eating disorders in sport: From theory to research to intervention. In G. Tenenbaum & R.C. Eklund (Eds.), *Handbook of Sport Psychology* (3rd ed.; pp. 352-378). Hoboken, NJ: Wiley.

18. Sonstroem, R.J., & Potts, S.A. (1996). Life adjustment correlates of physical self-concepts. *Medicine and Science in Sports and Exercise, 28*, 619-625. http://journals.lww.com/acsm-msse/Abstract/ 1996/05000/ Life_adjustment_correlates _of_physical.14.aspx

19. Thompson, A.M., & Chad, K.E. (2002). The relationship of social physique anxiety to risk for developing an eating disorder in young females. *Journal of Adolescent Health, 31*, 183-189. http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T80-469GFNW-B&_user=2386327&_coverDate= 08%2F31%2F2002&_rdoc=1& _fmt= high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1416730442&_r erunOrigin=scholar.google&_acct=C000057148&_version=1&_urlVersion=0&_useri d=2386327&md5=dfaf52beeb5e87ca9449a18c0377ff09

20. Tilgner, L., Wertheim, E.H., & Paxton, S.J. (2004). Effect of social desirability on adolescent girls' responses to an eating disorders prevention program. *International Journal of Eating Disorders, 35*, 211-216. http:// www.interscience. wiley. com/ journal/107629358/abstract

21. Williamson, D.A., Netemeyer, R.G., Jackman, L.P., Anderson, D.A., Funsch, C.L., & Rabalais, J.Y. (1995). Structural equation modeling of risk factors for the development of eating disorder symptoms in female athletes. *International Journal of Eating Disorders, 17*, 387-393. http://www. interscience. wiley.com/ journal/ 112413460/ abstract