

# The Skinny on Body Dissatisfaction: A Longitudinal Study of Adolescent Girls and Boys

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Received August 25, 2005; accepted October 19, 2005  
Published online: 15 February 2006

The present study tested whether theoretically derived risk factors predicted increases in body dissatisfaction and whether gender moderated these relations with data from a longitudinal study of 428 adolescent girls and boys because few prospective studies have examined these aims, despite evidence that body dissatisfaction increases risk for various psychiatric disturbances. Body dissatisfaction showed significant increases for girls and significant decreases for boys during early adolescence. For both genders, parental support deficits, negative affectivity, and self-reported dietary restraint showed significant relations to future increases in body dissatisfaction. Ideal body internalization and body mass index did not demonstrate significant relations to future increases in body dissatisfaction; peer support deficits showed a marginal relation to this outcome. Gender did not moderate these relations, despite adequate power to detect interactive effects.

**KEY WORDS:** body dissatisfaction; adolescence; gender differences.

Considerable research has been devoted to understanding the consequences of body dissatisfaction, or displeasure with one's weight and shape (Thompson *et al.*, 1999). Historically, much of this research has focused on females because of the dramatic rise in body dissatisfaction following puberty (Rosenblum and Lewis, 1999) and the greater sociocultural emphasis on appearance and thinness for females. However, recent research has indicated that body dissatisfaction is also a substantial concern among adolescent boys (Jones, 2004; Presnell *et al.*, 2004). For both genders, the desire to alter shape or weight is common (Ricciardelli and McCabe, 2001), and is associated with emotional distress (Johnson and Wardle, 2005), dramatic measures to alter appearance, such as cosmetic surgery or steroid use (Hoffman and Brownell, 1997; Thompson *et al.*, 1999), as well as psychiatric disturbances such as depression (Stice and Bearman, 2001)

and eating disorders (Keel *et al.*, 1997; Stice *et al.*, 2002). Although the deleterious impact of body dissatisfaction has been well established, particularly for girls, the factors that increase the risk for body image concerns are less well understood.

Recent research has identified factors that are associated with body dissatisfaction, but relatively few studies have examined these relations prospectively (see Jones, 2004; Presnell *et al.*, 2004; Stice and Whitemont, 2002 for exceptions) or with regard to the timing of the onset of body dissatisfaction as adolescents progress through puberty. Moreover, little is known about whether the risk factors for body dissatisfaction differ by gender. Accordingly, the goals of the present study were to (a) examine the ways in which rates of body dissatisfaction differ by age, gender, and other individual characteristics in a community sample of adolescent boys and girls; (b) examine the prospective influence of social, psychological, and biological factors on the development of body dissatisfaction for adolescent girls and boys; and (c) test for gender differences in these risk factors. Such information is imperative in order to clarify etiologic models, inform preventive efforts, and help identify characteristics of subgroups at high risk for body dissatisfaction and related problems.

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### Ideal Body Internalization

According to the gender intensification hypothesis (Hill and Lynch, 1983), as adolescents mature physically and emotionally they begin to identify more strongly with their same-gender stereotype. For girls, this stereotype emphasizes the importance of physical attractiveness as a key evaluative dimension for females (Stice *et al.*, 2000; Wichstrom, 1999), and in Western culture, physical attractiveness in women is inextricably linked with thinness (Nichter and Nichter, 1991). In contrast to the thin-ideal espoused for females, research suggests that some boys subscribe to an ideal that emphasizes a mesomorphic build valuing muscularity over thinness (Smolak *et al.*, 2001). Research confirms that adolescent boys are more likely than girls to engage in behaviors to increase weight and musculature (McCabe and Ricciardelli, 2001, 2004).

Theoretically, girls and boys who have internalized these ideals would be vulnerable to body dissatisfaction when this ideal is not actualized. For girls, the discrepancy between ideal and actual shape is amplified following puberty, because increases in adiposity move girls further from the thin-ideal (McCarthy, 1990). Simultaneously, girls increasingly identify with the female stereotype and focus on appearance as its central evaluative dimension. This confluence of events during adolescence creates a period of significant vulnerability for girls. In support of this theory, thin-ideal internalization (i.e., the degree to which one “buys into” the importance of thinness) increases for girls during this time and predicts increases in body dissatisfaction for adolescent girls (Stice and Bearman, 2001). The relation between the internalization of the male ideal and body dissatisfaction in boys has received less examination, although research has demonstrated that drive for muscularity correlates with low self-esteem and efforts to increase body mass (McCreary and Sasse, 2000), and internalization of sociocultural attitudes toward appearance also correlates with weight control techniques for boys (Smolak *et al.*, 2001). In one study that directly examined the relation between internalized appearance ideals and body dissatisfaction among boys, internalized appearance ideals were a robust predictor of changes in body dissatisfaction (Jones, 2004).

### Body Mass

As girls advance through puberty, the increased adiposity moves them farther from the thin-ideal, thus contributing to decreased body image satisfaction. In support of this assertion, previous research has verified that

increases in body mass also prospectively predict girls' body dissatisfaction (Stice and Whitenton, 2002). In contrast, the changes brought about by puberty theoretically move boys closer to the larger, more muscular ideal. However, the evidence regarding the trajectory of male body dissatisfaction indicates that adolescent boys are often split between those who desire to lose versus gain weight (McCabe *et al.*, 2001; Neumark-Sztainer *et al.*, 1999). Although body mass emerged as a significant predictor of body dissatisfaction for boys in one prospective study (Field *et al.*, 2001), another found null effects (Barker and Galambos, 2003). These inconsistent findings may suggest a more complex relation between body mass and body dissatisfaction in boys. For example, one prospective investigation suggested that dissatisfaction in boys is associated only with being under or overweight, while average weight boys were the most satisfied with their physical appearance (Richards *et al.*, 1990). Further support comes from another study that found that body mass prospectively predicted body dissatisfaction in a sample of adolescent boys, but this relation showed a significant quadratic component, as opposed to the linear relation observed in girls (Presnell *et al.*, 2004). Thus, being either underweight or overweight was associated with body dissatisfaction for males, whereas girls' dissatisfaction increased with increasing body mass.

### Social Support

Social support has also been explored as a risk factor for the development of body dissatisfaction. Theoretically, gender intensification is triggered not only by girls' actual physical maturation and consequent weight gain, but also by the way in which peers and parents respond to these changes (Wichstrom, 1999). Deficiencies in both the quantity and quality of social support have been linked with a host of psychosocial concerns for adolescents, including low self-esteem and body dissatisfaction. Hence, adolescents who feel unconditionally accepted by their support network may be less likely to try to attain acceptance by conforming to the thin ideal. In contrast, those who experience rejection from peers and parents may attribute this lack of support in part to their physical appearance.

Empirical support for this relation has been inconsistent. Stice and Whitenton (2002) found that deficits in social support predicted body dissatisfaction for adolescent girls, and another prospective study found that a supportive maternal relationship was significantly associated with increased body satisfaction (Barker and Galambos,

2003). However, a 3rd study with a smaller sample size failed to demonstrate the relation between social support and body dissatisfaction in girls (Byely *et al.*, 2000). Because appearance is not as central an evaluative dimension for boys, however, deficits in social support may not be as strongly linked to body dissatisfaction for boys. The 1 prospective study that investigated the effects of social support on both boys' and girls' body image failed to find a significant effect (Presnell *et al.*, 2004), and another prospective study found that although parental support predicted girls' greater body satisfaction, it was not related to this outcome for boys (Barker and Galambos, 2003). Furthermore, a cross-sectional study found that parental feedback about weight was not correlated with body dissatisfaction for males (Schwartz *et al.*, 1999). More research on this risk factor is warranted to determine the effects of interpersonal variables such as social support on boys' body dissatisfaction.

### Dieting

For adolescent girls who believe that achieving the thin-ideal will result in psychosocial benefits and who have received messages that they deviate from this ideal, dieting may serve as a strategy for altering their physique (McCabe and Ricciardelli, 2001). Theoretically, as adipose tissue increases following puberty, adolescent girls may attempt to counter this change by restricting their caloric intake. However, research suggests that self-reported attempts to restrict caloric intake predict weight gain, rather than weight loss (Stice *et al.*, 2005). Thus, dieting may result in the opposite of its intended effect—increasing girls' frustration and reducing their feelings of self-efficacy for producing weight change. In keeping with this theoretical assertion, girls' self-reported dieting attempts predicted increases in body dissatisfaction (Barker and Galambos, 2003).

As previously discussed, while body mass has a linear relation with body dissatisfaction for girls, research suggests that boys are split between those who wish to lose weight and those who wish to gain weight (McCabe *et al.*, 2001; Neumark-Sztainer *et al.*, 1999). Dieting may therefore increase the risk for body dissatisfaction among those boys who are trying to reduce body mass and experience the dietary failure and weight gain that has been associated with self-reported dieting in girls (Stice *et al.*, 1999; Stice *et al.*, 2005). On the other hand, some boys may be more likely to try to increase size and musculature, as one cross-sectional study demonstrated (McCabe and Ricciardelli, 2001). For these boys, changes in diet might

reflect an attempt to increase lean muscle mass. Attempts to manage weight did not predict body dissatisfaction in one prospective study of adolescent boys (Barker and Galambos, 2003).

### Negative Affect

Affective disturbances have also been implicated in the development of body dissatisfaction (Taylor and Cooper, 1992). Theoretically, depressed affect induces a preference for, and selective attention to, negative information about oneself and the world (Beck, 1976). This information processing bias may result in increased attention to displeasing body characteristics and foster negative comparisons of one's body with others' bodies. This hypothesis has received mixed empirical support, however. Acute negative affect inductions produced acute body dissatisfaction among girls (Baker *et al.*, 1995; Taylor and Cooper, 1992), suggesting at least a short-term relation between negative mood and body distress. However, prospective studies have found that neither negative affect (Presnell *et al.*, 2004) nor depressive symptoms (Stice and Whitenton, 2002) predicted body dissatisfaction for adolescent girls. There is some evidence that this relation may be stronger for boys than girls. One study found that negative affect predicted body dissatisfaction in boys, but not girls (Presnell *et al.*, 2004). In addition, negative affect was associated with body change strategies in a sample of adolescent boys (Ricciardelli and McCabe, 2003). Further examination of this variable is needed to determine the nature of the relationship between affective disturbances and body dissatisfaction, and whether this relation differs by gender.

### Age

As previously discussed, pubertal weight gain is thought to increase girls' risk of body dissatisfaction, whereas for boys increases in weight may increase satisfaction with one's weight and shape, assuming that this increase represents lean muscle mass. Indeed, a recent study by McCabe and Ricciardelli (2004) noted that early-maturing girls and girls who physically matured at the same time as their peers reported higher levels of body dissatisfaction than girls whose pubertal development was delayed relative to peers. In contrast, boys who physically matured earlier than their same-sex peers had the highest levels of body satisfaction. Thus, one might assume that age for girls would be associated with increasing

levels of body dissatisfaction, whereas for boys the reverse would be true. In accordance with this assertion, prior research has demonstrated that boys show a decline in body dissatisfaction over time (Jones, 2004). For girls, some research has indicated that older girls evidence significantly greater levels of body dissatisfaction than their younger counterparts (Jones, 2004). However, this has not been explicitly tested using a co-ed sample of adolescents.

### Present Study

Whereas prior studies provide some preliminary support for several of the hypothesized risk factors for body dissatisfaction and potential gender differences among those risk factors, this literature has certain limitations. Much of this previous research has examined risk factors for body dissatisfaction separately in samples of boys and girls (e.g. Jones, 2004; McCabe and Ricciardelli, 2004) rather than a co-ed sample. This study improves upon prior research by testing whether gender moderates the relation of each risk factor to later development of body dissatisfaction. An explicit test of the gender-by-risk factor interaction is required in order to demonstrate that the predictor variables are associated with different levels of risk for girls versus boys (Baron and Kenny, 1986). In view of these gaps in the literature, the current study sought to directly compare a sample of boys and girls in order to elucidate the processes by which adolescents become body dissatisfied, and whether these processes differ for girls versus boys.

### Hypotheses

1. The developmental course of body dissatisfaction will be moderated by gender. Specifically, body dissatisfaction will increase among girls over the course of the study whereas rates of body dissatisfaction will decrease for boys over time. Furthermore, girls will show higher rates of body dissatisfaction than boys overall.
2. The relations among certain hypothesized predictors of body dissatisfaction will be moderated by gender. Ideal body internalization, dieting, body mass and deficits in social support will be stronger predictors of increased body dissatisfaction for girls due to hypothesized gender differences in the conception of size and shape and the centrality of appearance as an evaluative dimension. Based on previous findings, we hypothesize that negative affect will be a stronger predictor of body dissatisfaction for boys.

## METHOD

### Participants

Participants were 247 adolescent girls and 181 adolescent boys from four public and four private middle schools in a large metropolitan area of the Southwestern United States. Adolescents ranged in age from 12 to 16 ( $M = 13.57$ ). The sample was composed of 2% Asian/Pacific Islanders, 4% African Americans, 64% Caucasians, 18% Hispanics, 1% Native Americans, and 5% who specified "other" or mixed racial heritage, which was representative of the ethnic composition of the schools from which we sampled (2% Asian/Pacific Islanders; 8% African Americans, 65% Caucasians, 21% Hispanics; 4% "other or mixed"). Highest educational attainment for parents ranged from grade school graduate (2%) to graduate degree (19%) with a mode of college graduate (42%).

### Procedures

The study was presented to parents and participants as an investigation of adolescent mental and physical health behaviors. Parents of all 8-grade girls and boys from the participating schools were sent a description of the study along with an informed consent letter, and active parental consent and adolescent assent were obtained from all participants. This resulted in an average participation rate of 53% of eligible students across schools, similar to that observed in other school-recruited samples using active consent procedures and structured interviews (e.g., 61% for Lewinsohn *et al.*, 1994).

Participants completed a self-report questionnaire, participated in a structured psychiatric interview, and had their weight and height measured by research assistants at baseline (T1) and at 1- and 2-year follow-up (T2 and T3, respectively). Assessments took place during elective courses during regular school hours, immediately after school on the school campus, or in the participants' homes. Interviews were conducted by clinical assessors with a bachelors, masters, or doctoral degree in psychology. Clinical assessors attended 24 hours of training, and were required to show a minimum ( $\kappa$ ) agreement with expert raters of 0.80 before starting data collection. Participants received a \$15 gift certificate to a local book and music store as compensation for participating in the study. This project received human subject's approval from the University of Texas Institutional Review Boards, as well as from the Austin Independent School District.

## Measures

### *Ideal Body Internalization*

The Thinness and Restricting Expectancy Inventory (TREI; Hohlstein *et al.*, 1998) assessed ideal-body internalization for the girls. Participants indicated their level of agreement with statements concerning expected social and psychological benefits from achieving thinness using a 5-point response format ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The TREI has adequate internal consistency ( $\alpha = 0.98$ ), test-retest reliability ( $r = 0.80$ ), and convergent validity (Hohlstein *et al.*, 1998). Because it has been demonstrated that the ideal body type for boys differs from that of girls (Smolak *et al.*, 2001) items were modified to reflect the expected benefits from achieving leanness and muscularity as well as thinness for males. This scale had a  $\alpha = 0.80$  for the combined sample at T1 ( $\alpha = 0.85$  at T1 for boys and a  $\alpha = 0.80$  at T1 for girls).

### *Body Mass*

The body mass index ( $BMI = kg/M^2$ ) was used to reflect adiposity (Pietrobelli *et al.*, 1998). Height was measured to the nearest millimeter using stadiometers and weight was measured with digital scales. Two measures of height and weight were obtained and averaged. The BMI shows convergent validity ( $r = 0.80$ – $0.90$ ) with direct measures of total body fat such as dual energy X-ray absorptiometry (Pietrobelli *et al.*, 1998).

### *Social Support*

Perceived social support was measured with items adapted from the Network of Relationships Inventory (Furman and Buhrmester, 1985) assessing companionship, guidance, intimacy, affection, admiration, and reliable alliance from parents and peers. Items are averaged for analyses to form separate scales of parental support and peer support. The internal consistency ( $M\alpha = 0.89$ ), test-retest reliability (M1-month  $r = 0.69$ ), and convergent and criterion validity of this measure have been documented (Furman and Buhrmester, 1985; Furman, 1996). At T1, parental support had an  $\alpha = 0.87$  and peer support had an  $\alpha = 0.89$ .

### *Dieting*

The Dutch Restrained Eating Scale (DRES; van Strien *et al.*, 1986a,b) was used to assess dieting. Par-

ticipants indicate the frequency of dieting behaviors using 5-point scales (1 = *never* to 5 = *always*) and items are averaged for analyses. This scale has shown internal consistency ( $\alpha = 0.95$ ), test-retest reliability ( $r = 0.82$ ), convergent validity (with self-reported caloric intake), and predictive validity for future increases in bulimic symptoms (Stice, 2001; van Strein *et al.*, 1986). This scale had an  $\alpha = 0.92$  at T1.

### *Negative Affectivity*

Twelve items from Buss and Plomin's (1984) Negative Affect Scale were used to assess a propensity toward becoming emotionally distressed. Items were averaged for analyses. Research has found this scale to possess acceptable internal consistency ( $\alpha = 0.82$ ), test-retest reliability ( $r = 0.80$ ), and predictive validity for onset of depression (Buss and Plomin, 1984; Hayward *et al.*, 1998). This scale had an  $\alpha = 0.79$  at T1.

### *Body Dissatisfaction*

Body dissatisfaction was assessed with an adapted form of the Satisfaction and Dissatisfaction with Body Parts Scale (Berscheid *et al.*, 1973), which asks participants to indicate their level of satisfaction with 9 body parts using a 5-point scale ranging from 1 (*extremely satisfied*) to 5 (*extremely dissatisfied*). Items are averaged for analyses. This scale has shown internal consistency ( $\alpha = 0.94$ ), test-retest reliability ( $r = 0.90$ ), and predictive validity for future increases in bulimic symptoms (Stice, 2001). Because some of the items on this scale appeared to assess satisfaction with body parts more relevant for females than males, 4 of the items were modified on the questionnaires completed by males. This scale had an  $\alpha = 0.92$  at T1 ( $\alpha = 0.93$  for girls and  $\alpha = 0.89$  for boys).

## RESULTS

### **Analytic Overview**

#### *Preliminary Analyses*

Preliminary analyses tested for baseline differences between girls and boys on all study variables and demographic factors. Attrition analyses tested whether participants who dropped from the study differed significantly from those who did not. Repeated measures ANOVA models examined change in each of the predictor variables and body dissatisfaction over the 3 measurement periods

by gender, with time as a 3-level within subjects factor and gender as a 2-level between-subjects factor. A priori planned comparisons were conducted to test for significant changes in each study variable at all time points separately for girls and boys.

#### Descriptive Analyses

Hierarchical linear models (HLM; Bryk *et al.*, 2000) probed the relations between all T1 risk factors and age on increases in body dissatisfaction over time, to investigate whether girls evidenced greater increases in body dissatisfaction than boys as they increased in age over the course of the study (hypothesis 1). The following equation was generated for these exploratory analyses:

$$\begin{aligned} \text{Level 1 : } & Y = B_{0i} + B_{1i} \times (\text{AGE}_i) + R_i \\ \text{Level 2 : } & B_{0i} = G_{00} + U_{0i} \\ & B_{1i} = G_{01} + G_{11} \times (\text{SEX}) + U_{1i} \end{aligned}$$

In which where  $B_{0i}$  represents body dissatisfaction for individual  $i$  at the 1st data collection (T1);  $B_{1i}$  represents the linear trend in body dissatisfaction scores across the 3 data collections for individual  $i$ ;  $\text{AGE}_i$  represents the linear trend for participant age across the 3 data collections for individual  $i$ ; and  $R_i$  represents random error in body dissatisfaction for individual  $i$ . For Level 2 of these models,  $G_{00}$  represents mean status of body dissatisfaction for all participants at 1st data collection;  $U_{0i}$  represents random error in  $B_{0i}$  for individual  $i$ ;  $G_{01}$  represents mean linear change in body dissatisfaction for all participants, and  $G_{11}$  represents mean linear change in body dissatisfaction as predicted by sex, and  $U_{1i}$  represents random error in  $B_{1i}$  for individual  $i$ . Sex (0 = girls, 1 = boys) was entered as a Level 2 time invariant covariate in order to determine whether the slope generated by the Level 1 equation varied by the different levels of sex at Level 2. Finally, independent  $t$ -tests performed in SPSS compared the means of girls' and boys' level of body dissatisfaction across all measurement periods at ages 13, 14, 15, and 16 to determine the age at which gender differences emerged.

#### Prospective Analyses

Hierarchical linear models tested the univariate prospective relations between all T1 risk factors and age on increases in body dissatisfaction over time. T1 values for the outcome (initial body dissatisfaction) were used to estimate the parameters of change over time for each individual, thereby ensuring a truly prospective test (Raudenbush and Byrk, 2002). For all models, baseline levels of the risk factors were entered as Level 2

time-invariant covariates, and the following equation was generated:

$$\begin{aligned} \text{Level 1 : } & Y = B_{0i} + B_{1i} \times (\text{TIME}_i) + R_i \\ \text{Level 2 : } & B_{0i} = G_{00} + U_{0i} \\ & B_{1i} = G_{01} + G_{11} \times (\text{RISK FACTOR}) + U_{1i} \end{aligned}$$

where  $B_{0i}$  represents body dissatisfaction for individual  $i$  at the 1st data collection (T1);  $B_{1i}$  represents the linear trend in body dissatisfaction scores across the 3 data collections for individual  $i$ ;  $\text{TIME}_i$  represents the linear trend for time across the 3 data collections for individual  $i$ ; and  $R_i$  represents random error in body dissatisfaction for individual  $i$ . For Level 2 of these models,  $G_{00}$  represents mean status of body dissatisfaction for all participants at 1st data collection;  $U_{0i}$  represents random error in  $B_{0i}$  for individual  $i$ ;  $G_{01}$  represents mean linear change in body dissatisfaction for all participants, and  $G_{11}$  represents mean linear change in body dissatisfaction as predicted by baseline levels of each risk factor and  $U_{1i}$  represents random error in  $B_{1i}$  for individual  $i$ .

To assess whether gender moderated the relation between T1 risk factors and future growth in body dissatisfaction (hypothesis 2), HLM models were generated to assess the effect of Level 2 time-invariant covariates of gender (0 or 1), T1 risk factor, and the interaction of gender and the T1 risk factor on the slope of the Level 1 unconditional model of body dissatisfaction over time:

$$\begin{aligned} \text{Level 1 : } & Y = B_{0i} + B_{1i} \times (\text{TIME}_i) + R_i \\ \text{Level 2 : } & B_{0i} = G_{00} + U_{0i} \\ & B_{1i} = G_{10} + G_{11} \times (\text{SEX}) + G_{12} \\ & \quad \times (\text{RISK FACTOR}) + G_{11} \times (\text{SEX} \\ & \quad \times \text{RISK FACTOR}) + U_{1i} \end{aligned}$$

For significant interactions, follow up analyses of the simple effects of the T1 risk factor on growth in body dissatisfaction were conducted separately for boys and girls. Finally, risk factors that showed a significant prospective relation with growth in body dissatisfaction were entered simultaneously into a multivariate model in order to determine the unique contribution of each significant predictor to growth in body dissatisfaction.

#### Preliminary Analyses

Of the original 428 participants, 15 did not provide data at T2 (3%), and 19 did not provide data at T3 (4%), although only 10 participants did not provide data at both T2 and T3 (2%). Attrition analyses indicated that participants who dropped out of the study did not differ from

**Table I.** Correlations Among the T1 Putative Risk Factors and T1, T2, and T3 Body Dissatisfaction, Along With Means and Standard Deviation for Boys and Girls

	2	3	4	5	6	7	8	9	<i>M</i>	<i>SD</i>
1. Ideal Body Intern	-0.06	0.12	0.01	-0.01	0.16	0.11	0.07	0.10	3.22	0.75
2. Body Mass Index		0.09	-0.06	-0.04	0.42	0.30	0.31	0.19	21.66	4.69
3. Negative Affect			-0.19	-0.02	0.25	0.32	0.28	0.26	2.68	0.61
4. Support-Parent				0.10	-0.08	-0.32	-0.22	-0.28	3.96	0.84
5. Support-Peer					-0.08	-0.10	-0.14	-0.17	4.16	0.77
6. Dietary Restraint						0.38	0.31	0.32	2.02	0.87
7. T1 Body Dis							0.61	0.54	2.66	0.88
8. T2 Body Dis								0.66	2.68	0.84
9. T3 Body Dis									2.74	0.83

Note. Absolute correlations greater than 0.09 are significant at  $p < 0.05$ .

those who provided complete data on any of the variables considered in this study at T1. Because HLM uses full-information maximum likelihood estimation for missing data, the effective  $N$  for analyses was 428. Independent  $t$ -tests indicated that girls reported higher levels of body dissatisfaction, peer social support, negative affectivity and dietary restraint at T1; no other gender differences were significant. Means and standard deviations for all baseline variables, and the correlations among them, are provided in Table I. Repeated measures ANOVA models demonstrated that there were differences between boys and girls over time with regard to ideal body internalization,  $F(2, 748) = 3.267, p < 0.05$ , with boys showing greater increases than girls over the course of the study. A gender by time interaction also emerged for peer social support deficits, with boys showing relative increases in peer social support, while girls reported decreases in peer social support,  $F(2, 776) = 6.89, p < 0.05$ . Girls also evidenced greater increases in dietary restraint over time than boys in the study,  $F(2, 772) = 9.93, p < 0.05$ . No other significant time by gender interactions were noted. A priori planned comparisons were conducted to test for significant changes in each study variable at all time points separately for girls and boys. Unadjusted means and standard deviations for boys and girls at each measurement period, and the results of the paired  $t$ -tests, are reported in Table II. Means and standard deviation for all baseline measures by gender are reported in Table III.

### Descriptive Analyses

The mean body dissatisfaction score for girls was 2.7 at T1, 2.8 at T2, and 2.9 at T3, which reflects a neutral level of satisfaction. The mean body dissatisfaction score for boys was 2.6 at T1, and 2.5 at T2 and T3, corresponding with the midpoint between *neutral* and *moderately satisfied*. If body dissatisfaction is defined as a score that

corresponds to an average response of *moderately dissatisfied* or *extremely dissatisfied*, the rates of body dissatisfaction were 37% (T1), 35% (T2), and 44% (T3) for girls and 23% (T1), 19% (T2), and 16% (T3) for boys. This is consistent with the relatively higher rates of body dissatisfaction among girls than boys found in other studies (e.g. Keel *et al.*, 1997) and similar to the rates of body dissatisfaction found in other studies (Fox *et al.*, 1994; Stice and Whitenton, 2002). It is noteworthy that girls who reported being extremely satisfied or moderately satisfied with their bodies had a significantly lower mean body mass ( $M = 19.78$ ) than boys who reported being similarly satisfied ( $M = 21.98, t = -3.09, p < 0.005$ ). Girls who reported being extremely or moderately dissatisfied with their weight ( $M = 24.36$ ) did not differ statistically from males who reported similar dissatisfaction ( $M = 21.72$ ).<sup>7</sup>

To probe the relation between age and increases in body dissatisfaction, the univariate relation between age and body dissatisfaction was first investigated in an individual model to test whether T1 age was associated with growth in body dissatisfaction over time. The main effect of age was not significant. To test whether this relation was moderated by gender, gender was entered at Level 2, and results indicated that the cross-level interaction of age and gender was significant, with increases in age associated with increases in body dissatisfaction for girls but not for boys ( $\beta = -0.12, t = -5.62, p < 0.001$ ). Next,

<sup>7</sup> Because previous research indicates that body mass may deviate from a linear relation for boys (Muth and Cash, 1997; Presnell *et al.*, 2004), we tested for higher-order effects. An orthogonal polynomial analysis of the Gender  $\times$  BMI effect indicated a significant Gender  $\times$  Linear interaction ( $r = 0.685, p \leq 0.001$ ). Follow-up tests of the simple effects separately for boys versus girls suggested that while the relation of BMI and body dissatisfaction had a significant linear component for girls, but not for boys. On the other hand, a quadratic (*u-shaped*) model was supported at T1 for boys ( $r = 0.280, p \leq 0.05$ ), but not for girls. Although the quadratic model was no longer supported for boys at T2 and T3, BMI and body dissatisfaction continued to deviate from a linear association for boys in this sample.

**Table II.** Means and Standard Deviations Separately for Girls and Boys on Study Variables, and Results of the Pairwise Comparisons at Time points 1, 2, and 3

Variable	Time 1 (Baseline)		Time 2 (1-year follow-up)		Time 3 (2-year follow-up)	
	<i>M</i>	SD	<i>M</i>	SD	<i>M</i>	SD
Ideal body internalization						
Girls	3.22 <sub>a</sub>	0.67	3.33 <sub>b</sub>	0.73	3.32	0.75
Boys	3.22 <sub>a</sub>	0.84	3.29 <sub>a</sub>	0.79	3.51 <sub>b</sub>	0.76
Body mass						
Girls	21.56 <sub>a</sub>	4.74	22.06 <sub>b</sub>	4.71	22.54 <sub>c</sub>	4.83
Boys	21.78 <sub>a</sub>	4.64	22.49 <sub>b</sub>	4.63	23.34 <sub>c</sub>	5.14
Negative affect						
Girls	2.78	0.60	2.79	0.73	2.72	0.72
Boys	2.57 <sub>a</sub>	0.59	2.48	0.71	2.45 <sub>b</sub>	0.41
Social support—parents						
Girls	3.92	0.90	3.89	0.94	3.87	0.93
Boys	4.00 <sub>a</sub>	0.74	3.89 <sub>b</sub>	0.82	3.87 <sub>b</sub>	0.79
Social support—Peers						
Girls	4.35	0.72	4.37 <sub>a</sub>	0.75	4.27 <sub>b</sub>	0.82
Boys	3.91 <sub>a</sub>	0.75	3.89 <sub>a</sub>	0.83	4.11 <sub>b</sub>	0.70
Dietary restraint						
Girls	2.13	0.91	2.14	0.87	2.13	0.87
Boys	1.87 <sub>a</sub>	0.80	1.61 <sub>b</sub>	0.66	1.58 <sub>b</sub>	0.69
Body dissatisfaction						
Girls	2.74 <sub>a</sub>	0.95	2.82	0.90	2.91 <sub>b</sub>	0.84
Boys	2.55	0.76	2.48	0.77	2.49	0.75

Note. Means in the same row with different subscripts are significantly different at  $p < 0.05$ .

independent *t*-tests compared the means of girls’ and boys’ reported levels of body dissatisfaction aggregated across all measurement periods at ages 13, 14, 15 and 16 to determine the age at which gender differences in body dissatisfaction emerged. At age 13, regardless of measurement period, boys and girls reported similar levels of body dissatisfaction ( $M$  girls = 2.71;  $M$  boys = 2.58) and there were no significant differences. By age 14, however, girls reported significantly higher levels of body dissatisfaction ( $M = 2.74$ ) compared to boys ( $M = 2.56$ ,  $t = 2.03$ ,  $p < 0.05$ ), and girls’ mean level of body dissatisfaction continued to increase with age, while mean

level of body dissatisfaction decreased for boys, as evidenced by levels of body dissatisfaction reported at ages 15 ( $M$ : girls = 2.90;  $M$ : boys = 2.49,  $t = 4.75$ ,  $p < 0.001$ ) and at age 16 ( $M$ : girls = 2.95;  $M$ : boys = 2.35,  $t = 5.62$ ,  $p < 0.001$ ).

**Risk Factors for Increases in Body Dissatisfaction**

As hypothesized, initial elevations in dietary restraint ( $\beta = 0.05$ ,  $t = 2.39$ ,  $p < 0.05$ ), negative affect ( $\beta = 0.07$ ,  $t = 2.20$ ,  $p < 0.05$ ), and deficits in parental social support ( $\beta = -0.05$ ,  $t = -2.02$ ,  $p < 0.05$ ), predicted growth in body dissatisfaction in the combined sample of boys and girls over the study period. Deficits in peer social support approached statistical significance as a predictor of growth in body dissatisfaction ( $\beta = 0.04$ ,  $t = 1.89$ ,  $p = 0.06$ ). However, ideal body internalization, and body-mass index did not show significant prospective relations. These models are reported in Table IV.

To test whether gender moderated any of the univariate effects of the risk factors, interaction terms were computed for gender and each of the T1 independent variables and added to the models described earlier. No significant interactions with gender were observed among the putative risk factors.

Risk factors showing significant univariate relations were then included in a multivariate regression model.

**Table III.** Means and Standard Deviations for Each T1 Variable by Gender

	Gender			
	Girls		Boys	
	<i>M</i>	SD	<i>M</i>	SD
Ideal body internalization	3.22	0.67	3.22	0.84
Body mass	21.56	4.74	21.78	4.64
Negative affect	2.78 <sub>a</sub>	0.60	2.57 <sub>b</sub>	0.59
Social support—Parents	3.92	0.90	4.00	0.74
Social support—Peers	4.35 <sub>a</sub>	0.72	3.91 <sub>b</sub>	0.75
Dietary restraint	2.13 <sub>a</sub>	0.91	1.87 <sub>b</sub>	0.80
T1 body dissatisfaction	2.74 <sub>a</sub>	0.95	2.55 <sub>b</sub>	0.76
T2 body dissatisfaction	2.82 <sub>a</sub>	0.90	2.48 <sub>b</sub>	0.77
T3 body dissatisfaction	2.91 <sub>a</sub>	0.84	2.49 <sub>b</sub>	0.75

Note. Means in the same row with different subscripts are significantly different at  $p < 0.05$ .



**Table IV.** Univariate Relations of Each Risk Factor to Adolescent Boys' and Girls' Increases in Body Dissatisfaction

Effect	Fixed effect					Random effect				
	Parameter	Coefficient	SE	<i>t</i>	<i>p</i>	Parameter	Variance	$\chi^2$	df	<i>p</i>
Ideal body internalization	$\beta_0$	2.65	0.042	63.22	< 0.001	$U_0$	0.540	1557.3	420	< 0.001
	$\beta_1$	0.01	0.024	0.61	ns	$U_1$	0.041	562.68	419	< 0.001
Body mass index	$\beta_0$	2.65	0.042	63.22	< 0.001	$U_0$	0.540	1557.2	420	< 0.001
	$\beta_1$	0.00	0.004	0.47	ns	$U_1$	0.042	565.37	419	< 0.001
Negative affectivity	$\beta_0$	2.65	0.042	63.22	< 0.001	$U_0$	0.541	1555.6	420	< 0.001
	$\beta_1$	0.07	0.030	2.20	< 0.05	$U_1$	0.044	574.00	419	< 0.001
Parental social support	$\beta_0$	2.65	0.042	63.22	< 0.001	$U_0$	0.541	1555.6	420	< 0.001
	$\beta_1$	-0.05	0.022	-2.20	< 0.05	$U_1$	0.044	573.91	419	< 0.001
Peer Social Support	$\beta_0$	2.65	0.042	63.58	< 0.001	$U_0$	0.541	1565.7	420	< 0.001
	$\beta_1$	-0.03	0.019	-1.89	< 0.06	$U_1$	0.040	564.31	419	< 0.001
Dietary Restraint	$\beta_0$	2.65	0.042	63.22	< 0.001	$U_0$	0.541	1556.7	420	< 0.001
	$\beta_1$	0.05	0.020	2.39	< 0.05	$U_1$	0.046	579.10	419	< 0.001

This model tested whether negative affect, dietary restraint, and deficits in peer and parental social support predicted T3 body dissatisfaction. Main effects of peer social support became nonsignificant in the multivariate model and negative affect was reduced to the trend level, but dietary restraint and parental support deficits showed significant unique relations to subsequent increases in body dissatisfaction in the multivariate model. These results are listed in Table V.

**DISCUSSION**

This study was designed to explore the developmental course of body dissatisfaction in a sample of adolescent boys and girls and test whether ideal body internalization, body mass index, negative affect, deficits in social support, and self-reported dietary restraint predicted increases in body dissatisfaction. Gender differences in the relations of the putative risk factors to body dissatisfaction were also examined.

**Developmental Course of Body Dissatisfaction**

Age at T1 did not predict increases in body dissatisfaction for the combined sample of girls and boys; however, this relation was moderated by gender. Follow up analyses demonstrated that for girls, increases in age

were associated with increases in body dissatisfaction. Although there were no significant differences between levels of body dissatisfaction for boys and girls in the sample at age 13, by age 14 girls were significantly more dissatisfied. This effect remained at ages 15 and 16. These findings mirror those described by Jones (2004), who also found that high-school girls endorsed higher levels of body dissatisfaction than middle school girls. Consistent with previous studies (Gardner *et al.*, 1999; Hargreaves and Tiggemann, 2002; Jones, 2004; Presnell *et al.*, 2004), rates of body dissatisfaction increased overall for the girls over the 2-year course of the study, and girls were generally more dissatisfied with their bodies than boys in the current sample at each time point. This is reflective of a developmental model of body dissatisfaction, wherein girls become increasingly more body dissatisfied during adolescence as they move away from the thin-ideal, and boys become more satisfied as they move toward the mesomorphic ideal (Smolak *et al.*, 2001). Furthermore, girls who reported satisfaction with their body size and shape were significantly thinner than boys who expressed similar levels of satisfaction. This suggests that while average weight boys are relatively content with their physique, girls' body satisfaction is correspondent with a physique that more closely approximates the current thin-ideal for females.

**Table V.** Multivariate Model of Risk Factors for Increases in Body Dissatisfaction for Adolescent Girls and Boys

Effect	Fixed effect					Random effect				
	Parameter	Coefficient	SE	<i>T</i>	<i>p</i>	Parameter	Variance	$\chi^2$	df	<i>p</i>
Body dissatisfaction	$B_0$	2.65	0.042	63.22	< 0.001	$U_0$	0.540	1555.1	420	< 0.001
Negative affect	$G_1$	0.05	0.030	1.71	= 0.08	$U_1$	0.053	603.70	416	< 0.001
Support-parental	$G_2$	-0.04	0.022	-2.02	< 0.05					
Support-peer	$G_3$	-0.03	0.022	-1.45	ns					
Dietary restraint	$G_4$	0.04	0.021	2.16	< 0.05					

### Risk Factors for Increases in Body Dissatisfaction

Despite this, ideal body internalization did not emerge as a prospective predictor of body dissatisfaction in this study. This is inconsistent with some previous research that has supported this relation for girls (Jones, 2004; Stice and Whitenton, 2002) and boys (Jones, 2004). However, another prospective study that examined thin-ideal internalization in a co-ed sample also did not find support for the predictive relation to body dissatisfaction (Presnell *et al.*, 2004). Ideal body internalization is thought to lead to body dissatisfaction through frustration engendered by failing to attain an ideal one holds in high esteem. Because there was no interaction of gender and ideal body internalization, these null findings cannot be attributed to gender differences in the way adolescents conceptualize the ideal body size and shape. As an aside, ideal body internalization also did not interact with obesity to predict body dissatisfaction for the current sample, suggesting that this variable does not predict increases in body dissatisfaction even among those adolescents who deviated substantially from the culturally sanctioned ideal.

Curiously, in the current study BMI also did not predict body dissatisfaction for adolescent boys and girls. This is in contrast to previous research (Barker and Galambos, 2003; Presnell *et al.*, 2004; Rosenblum and Lewis, 1999), which has demonstrated that BMI is a consistent predictor of girls' dissatisfaction and, in one study (Field *et al.*, 2001) for boys as well. Theoretically, increases in body weight cause one's body to diverge from the ideal, thus leading to dissatisfaction (McCarthy, 1990). Because gender did not moderate the relation between body mass and body dissatisfaction, this study does not offer evidence that body weight operates differently for girls and boys in terms of predicting body dissatisfaction, as suggested by theorists who maintain that boys strive for increases in body mass (Jacobi and Cash, 1994; McCreary and Sasse, 2000; Smolak *et al.*, 2001). It should be noted, however, that our measure of body dissatisfaction does not distinguish between displeasure with being too large versus being too small.

It is also worth noting that whereas girls in this study showed a linear association between BMI and body dissatisfaction at all measurement points, boys deviated from a linear association throughout the duration of the study. More puzzling, boys who endorsed the highest levels of dissatisfaction with their bodies were nearly identical in weight to boys who endorsed the greatest satisfaction. This suggests that one's perception of weight may be of greater psychological relevance than one's physical dimensions. It may also be the case that BMI is too broad

a measurement of the physical changes that adolescent girls and boys undergo during this important developmental phase, as it does not distinguish between weight gained via lean muscle versus fatty tissue. Thus, boys who weigh more due to increased muscle mass may be very satisfied with their physique, whereas boys whose weight increases as a result of adipose tissue may be displeased with this increase.

Initial elevations in negative affect predicted increased body dissatisfaction for the combined sample. Theoretically, the processing biases associated with affective disturbances could result in a preference for information about one's physique that confirms a negative sense of oneself (Beck, 1976). Although consistent with a previous study that found that negative affect was a prospective predictor of boys' body dissatisfaction (Presnell *et al.*, 2004) this relation was not moderated by gender in this sample, and thus is difficult to reconcile with previous prospective studies that found that affective disturbances did not predict body dissatisfaction for girls (Presnell *et al.*, 2004; Stice and Whitenton, 2002). To our knowledge, this is the 1st study to demonstrate this effect for a sample of both boys and girls.

Deficits in social support from parents—and to a lesser extent from peers—predicted body dissatisfaction for both boys and girls. Presumably, deficits in social support might escalate vulnerability to body dissatisfaction as individuals strive to gain social acceptance through conformity with body ideals, whereas supportive relationships with friends and family might offer protection from feelings of body dissatisfaction. This relation for girls has received support in prior research (Stice and Whitenton, 2002), although Jones (2004) found that peer acceptance about appearance predicted girls' body dissatisfaction, but did not predict body dissatisfaction in a separate sample of boys. In the current sample, parental support deficits were a more robust predictor of body dissatisfaction than peer social support deficits, and remained a significant predictor of body dissatisfaction in the multivariate analyses while peer support deficits dropped out of the model. Although it is widely believed that peer influence becomes increasingly salient throughout adolescence, this study supplies some evidence that parental relationships retain their relevance and remain a powerful predictor of adolescent body dissatisfaction.

As hypothesized, increases in self-reported dietary restraint predicted increases in body dissatisfaction. In theory, attempts to manage one's weight via dietary restraint could cultivate body dissatisfaction for both girls and boys because the frustration associated with dietary failure may increase displeasure with one's shape and

weight. Furthermore, self-reported dieting has been found to predict weight gain (Klesges *et al.*, 1992), which may also amplify feelings of body dissatisfaction. Consistent with this evidence, it has recently been suggested that identifying oneself as a dieter is a marker for a propensity to overeat, and therefore individuals who express the need to employ dietary restraint do so because they have a tendency to chronically over consume when not actively attempting to restrict their caloric intake (Lowe and Levine, 2005; Presnell and Stice, 2003). Although this relation has been supported for girls (Barker and Galambos, 2003), attempts to manage weight did not predict body dissatisfaction for boys in the one prospective study we located that examined this variable (Barker and Galambos, 2003). Gender did not moderate this relation, indicating that self-reported dietary restraint does not exert differential risk for boys versus girls.

None of the risk factors that predicted body dissatisfaction for the co-ed sample were moderated by gender—despite adequate power ( $> 0.88$ ) to detect small effects in this sample (Cohen, 1988). This is an important point, because the bulk of research in this area focuses primarily on girls, and researchers have theorized that the processes by which males and females become body dissatisfied are dissimilar (Keel *et al.*, 1998; Tiggemann and Pennington, 1990). Although girls in this study evidenced higher overall levels of body dissatisfaction than boys, the rates of body dissatisfaction among boys were not insubstantial, and the risk factors were equivalent. This suggests that interventions targeting youth at risk for developing body dissatisfaction—as well as the psychiatric outcomes that are associated with body dissatisfaction (e.g. depression, eating disorders)—should focus on both boys and girls. Results do suggest, however, that while girls uniformly wish to be thinner, boys are divided amongst those who desire to gain weight and those who desire to lose weight. Thus, interventions for boys may need to target both ends of the spectrum. The results of this study further indicate that an intervention aimed at individuals who express the need to diet may be especially helpful in decreasing levels of body satisfaction. Additionally, interventions that focus on increasing positive affect and peer and parental support would be particularly useful. Finally, this study indicated that the pivotal time to intervene with adolescents in order to prevent body dissatisfaction might differ for boys and girls. Boys appear to be most body dissatisfied in early adolescence, whereas girls become increasingly displeased with their physique as they progress into middle and late adolescence, suggesting that the optimal timing for intervention may differ by gender.

### Study Limitations

It is important to consider the limitations of this study when interpreting the findings. 1st, the low participation rate limits the generalizability of this sample. 2nd, because both the measure of body dissatisfaction and thin-ideal internalization were modified in order to include items relevant for both genders, it is possible that this may have introduced some measurement artifact. However, our results are commensurate with previous studies that have examined these constructs, increasing our confidence that they were adequately assessed. 3rd, this study did not differentiate between dissatisfaction with body parts that are perceived to be too small versus too large, a distinction that may have important theoretical consequences—especially for boys. Fourth, we did not examine other possible relations of study variables; for example, it is possible that body dissatisfaction may be reciprocally related to a number of the risk factors in the current study, or that risk factors may interact with one another to predict body dissatisfaction. Finally, whereas longitudinal data provide information regarding temporal precedence, 3rd variable explanations cannot be ruled out with a non-experimental design. Therefore, it is possible that some shared causal variable increases both the risk factors and body dissatisfaction.

### CONCLUSIONS

In this study, girls showed higher overall rates of body dissatisfaction than boys, and these rates increased over the course of the study while the reverse was true for boys. Nonetheless, our data suggest that a considerable number of adolescents experience body dissatisfaction, and that the variables that increase risk are analogous regardless of gender. Whereas the malleable risk factors measured in this study were not moderated by gender, there remained some striking distinctions between the girls and boys in this study. Girls who reported satisfaction with their bodies were significantly thinner than boys who reported the same level of satisfaction, and as girls aged, they became increasingly dissatisfied. Because body dissatisfaction is a ubiquitous concern for adolescents and associated with significant emotional distress as well as psychological impairment, efforts to clarify its etiology and interrupt this trajectory are of vital importance.

### ACKNOWLEDGMENTS

This study was supported by a career award (MH01708) and an individual research service award

(MH12834) from the National Institutes of Mental Health. Thanks go to project research assistants, Melissa Fisher, Katy Whitenton, and Natalie McKee, as well as to the many undergraduate volunteers who assisted with this project. Our gratitude also goes to the Austin Independent School District and the participants who made this study possible.

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