

Prospective Predictors of Body Dissatisfaction in Adolescent Girls and Boys: A Five-Year Longitudinal Study

Susan J. Paxton
La Trobe University

Marla E. Eisenberg and Dianne Neumark-Sztainer
University of Minnesota, Twin Cities Campus

This study investigated prospective risk factors for increases in body dissatisfaction in adolescent girls and boys in the Eating Among Teens Project. At the time of first assessment (Time 1), participants were a cohort of early adolescent girls ($N = 440$) and boys ($N = 366$) and a cohort of middle adolescent girls ($N = 946$) and boys ($N = 764$). Participants were followed up 5 years later (Time 2). Potential prospective risk factors examined included body mass index, socioeconomic status, ethnicity, parent dieting environment, peer environment, and psychological factors. Predictors of Time 2 body dissatisfaction were Time 1 body dissatisfaction, body mass index, socioeconomic status, being African American, friend dieting and teasing, self-esteem, and depression. However, the profile of predictors differed across the samples.

Keywords: risk factors, body dissatisfaction, longitudinal, adolescent girls and boys

Prospective risk factors for the development of body dissatisfaction during adolescence have received increasing attention as the prevalence and negative consequences of body dissatisfaction have become more widely recognized. In recent large community samples, body dissatisfaction has been reported by 24%–46% of adolescent girls and 12%–26% of adolescent boys (Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002; Presnell, Bearman, & Stice, 2004; Stice & Whitenton, 2002). Ricciardelli and McCabe (2001) found only 12.0% of girls and 16.6% of boys were their desired size. Indicative of more severe weight concern, in one study, 12.4% and 4.6% of girls and boys, respectively, reported using extreme weight loss strategies (e.g., fasting, use of diet pills, laxative abuse, or vomiting; Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002), and in another, 12.4% of boys reported frequently using or thinking about using food supplements or steroids to gain muscle (Ricciardelli & McCabe, 2003). A meta-analysis has demonstrated body dissatisfaction to be “one of the most consistent and robust risk and maintenance factors for eating pathology” (Stice, 2002, p. 833). Further, body dissatisfaction has been found to prospectively predict development of depressed mood (Holsen, Kraft, & Roysamb, 2001; Stice & Bearman, 2001). Given the widespread distress and negative outcomes associated with body dissatisfaction, it is important to understand factors that predict its development.

The major theories of the development of body dissatisfaction suggest that its etiology is multifactorial. Researchers propose that physical characteristics—especially larger body size and cultural-social environments emphasizing thinness and appearance—and psychological factors—including low self-esteem, depression, and beliefs about the importance of thinness—increase risk of development of body dissatisfaction (e.g., Cash, 2002; Paxton, Norris, Wertheim, Durkin, & Anderson, 2005; Stice, 1994; van den Berg, Thompson, Obremski-Brandon, & Covert, 2002). However, these models and related empirical studies have not given great consideration to potential differences in risk factors between girls and boys, despite social and appearance pressures varying considerably between girls and boys (e.g., Cafri et al., 2005; Cohane & Pope, 2001; Wichstrom, 1999). In addition, it has largely been assumed that risk factors for increases in body dissatisfaction will be similar across adolescence despite developmental tasks and roles changing markedly from early to late adolescence. Consequently, in the present research, we aimed to identify psychosocial predictors of increases in body dissatisfaction over a 5-year follow-up period, using a multivariate approach, in both girls and boys, at two developmental stages, from early to middle adolescence and from middle to late adolescence.

Cross-sectional research has supported potential predictive roles for increases in body dissatisfaction for a range of psychosocial factors, including body size, ethnicity, peer and parent environments that emphasize the importance of thinness, and personality variables. In the modernized world in which slimness is valued, it has been proposed that a large body size, representing a departure from the current beauty norm, increases vulnerability to body dissatisfaction (e.g., Stice, 1994, 2002; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Wertheim, Paxton, & Blaney, 2004). Consistent with this view, body mass index (BMI) is the most reliable correlate of body dissatisfaction (e.g., McCabe & Ricciardelli, 2003). Within cultures, however, there appear to be variations in beauty norms among ethnic groups, and, in particular, it has been suggested that the ideal figure in females is larger in

Susan J. Paxton, School of Psychological Science, La Trobe University, Melbourne, Australia; Marla E. Eisenberg, Division of General Pediatrics and Adolescent Health, Department of Pediatrics, University of Minnesota, Twin Cities Campus; Dianne Neumark-Sztainer, Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Twin Cities Campus.

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Correspondence concerning this article should be addressed to Susan J. Paxton, School of Psychological Science, La Trobe University, Melbourne 3086, Australia. E-mail: susan.paxton@latrobe.edu.au

African American than in other ethnic subcultures (Halpern, Udry, Campbell, & Suchindran, 1999; Neumark-Sztainer, Croll, et al., 2002). In addition, the majority of studies (e.g., Akan & Grillo, 1995; Kelly, Wall, Eisenberg, Story, & Neumark-Sztainer, 2005; Neumark-Sztainer, Croll, et al., 2002; Neumark-Sztainer, Story, Faibisch, Ohlson, & Adamiak, 1999), but not all (e.g., Striegel-Moore et al., 2000), have found that African American girls are less likely than European American girls to express body dissatisfaction. Similarly, African American boys are more likely to have high body satisfaction compared with other ethnic groups (Neumark-Sztainer, Croll, et al., 2002). Norms may also vary among socioeconomic groups independent of ethnicity and BMI. However, such potential differences have not been frequently examined.

It has also been proposed that immediate social environments that value appearance or slimness contribute to greater value being placed on appearance by the child. As this ideal is almost invariably difficult to achieve, higher internalization of sociocultural ideals generates greater body dissatisfaction (e.g., Stice, 1994; van den Berg et al., 2002). Family attitudes toward weight and shape reflected in parental weight loss practices and encouragement of children to diet may model or reinforce appearance values that are risk factors for body dissatisfaction. Cross-sectional research provides support for relationships between encouragement to diet by parents and body dissatisfaction and dieting in adolescents but provides less consistent support in relation to modeling effects (Fulkerson et al., 2002; Keery, Eisenberg, Boutelle, Neumark-Sztainer, & Story, in press; Wertheim, Martin, Prior, Sanson, & Smart, 2002; Wertheim, Mee, & Paxton, 1999). Parental child-feeding style has also been implicated in childhood eating and obesity, which may indirectly affect body image. In particular, parental restriction of and control over child food intake may increase desire to obtain restricted food, eating in the absence of hunger, and obesity (Birch, Fisher, & Davison, 2003; Fisher & Birch, 1999, 2002; Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002), although these relationships have not been consistently observed (Robinson, Kiernan, Matheson, & Haydel, 2001).

Similarly, peer environments that place high value on slimness, reflected in friend dieting behaviors and weight and shape teasing, have been proposed as risk factors for body dissatisfaction. Qualitative research has indicated that peer discussions of appearance may result in insecurity and body image concerns (Nichter, 2000; Wertheim, Paxton, Schutz, & Muir, 1997). Quantitative cross-sectional studies have also consistently reported associations between body dissatisfaction and peer conversations about appearance, perceived importance placed on appearance by friends, and appearance teasing (Barr Taylor et al., 1998; Eisenberg, Neumark-Sztainer, & Story, 2003; Jones, Vigfusdottir, & Lee, 2004; Paxton, Schutz, Wertheim, & Muir, 1999; Wertheim, Koerner, & Paxton, 2001). In 10th-grade girls, Paxton and colleagues (1999) found that perceived friend concern about thinness, friend talk about dieting, peer pressure to be thin, and weight teasing predicted body dissatisfaction after BMI and psychological and family variables had been taken into account. Similarly, Jones and colleagues (2004) observed significant correlations between appearance conversations and body dissatisfaction, and peer appearance criticism (teasing) and body dissatisfaction in both adolescent girls and boys. Eisenberg and colleagues (2003) reported that not only is weight teasing associated with body dissatisfaction in adolescent

girls and boys, but it is also correlated with low self-esteem and high depressive symptoms even after controlling for BMI.

In a cross-sectional study, combined perceived family and peer weight norms were associated with body concerns in boys and girls (Neumark-Sztainer, Wall, Story, & Perry, 2003). In addition to the importance placed on thinness by peers and family, within an individual, internalization of social appearance ideals, thinness in girls, and muscularity in boys are correlated with body dissatisfaction (Jones et al., 2004).

Finally, personality attributes (self-esteem and perfectionism) and related psychological functioning (especially depression) have been proposed to be associated with a negative and self-critical view of the self generally and of the body in particular, contributing to the development of body dissatisfaction (e.g., Cash, 2002; Stice, 1994; van den Berg et al., 2002). Cross-sectional support for relationships among these variables has also been observed (Ohring, Graber, & Brooks-Gunn, 2002; Paxton et al., 1999; Wade & Lowes, 2002).

Prospective Research

Although theoretical models and cross-sectional studies may suggest a risk factor role for different variables, longitudinal or experimental research is required to confirm the temporal precedence of a potential risk factor. Numerous longitudinal studies have explored putative prospective risk factors for body dissatisfaction or weight concerns in adolescent girls, whereas fewer have examined risk factors in boys (Wertheim et al., 2004). These studies have included consideration of more proximal risk factors, with follow-up periods of usually 1–2 years, whereas a smaller number have examined more distal risk factors, with follow-up periods of 3–8 years.

After researchers controlled for baseline body dissatisfaction, higher baseline BMI or change in BMI was the most reliable predictor of increases in body dissatisfaction in girls and boys in both short- and long-term follow-up studies (e.g., Field et al., 2001; Halpern et al., 1999; Ohring et al., 2002). However, in a 1-year follow-up of 17-year-olds, Presnell and colleagues (2004) found this relationship disappeared when negative affect was also considered in the analysis. The influence of norms held by different ethnic and socioeconomic groups has not received much attention in longitudinal studies. However, Halpern et al. (1999), in a study of girls, observed that being European American compared with African American predicted increases in body dissatisfaction over 2 years.

As attention has turned to the potential role of immediate social environments in the development of body dissatisfaction, more recent longitudinal analyses have included assessments of family and peer influences as predictor variables. To date, studies of this kind have had relatively short-term follow-up periods (1–2 years). With one exception (Byely, Archibald, Graber, & Brooks-Gunn, 2000), the studies offer support for the predictive role of social factors on change in body dissatisfaction. Field et al. (2001) observed more frequent development of weight concerns among girls when thinness was perceived as important to either parent, and among boys when their mother was trying to lose weight. Stice and Whitenton (2002) found perceived pressure to be thin (from parents, peers, and media) predicted body dissatisfaction in girls, whereas Presnell et al. (2004) found perceived pressure to be thin

from peers predicted body dissatisfaction in a univariate analysis, although it did not predict body dissatisfaction when considered in a multivariate analysis. In an interesting study by Jones (2004), the role of Time 1 peer appearance conversations on change in body dissatisfaction was mediated by body comparison tendency in girls. However, in boys, peer appearance conversations and concerns did not play a strong role. Rather, internalized appearance ideals predicted change in body dissatisfaction. In a longer follow-up (3 years), Cattarin and Thompson (1994) found weight teasing predicted body dissatisfaction. Notably, thin-ideal internalization and dysfunctional beliefs about appearance have also been found to be proximal predictors of increases in body dissatisfaction (Spangler, 2002; Stice, 2001; Stice & Whitenton, 2002).

There is mixed support for a risk factor role for personality and psychological well-being factors after controlling for initial body dissatisfaction. In studies of relatively short-term follow-up, Presnell et al. (2004) observed negative affect predicted increases in body dissatisfaction in boys but not in girls, whereas Stice and Whitenton (2002) did not observe a relationship between depression and body dissatisfaction in girls. In studies with long-term follow-up periods, Ohring et al. (2002) found poor emotional control in girls predicted increases in body dissatisfaction, and Martin and colleagues (2000) found negative emotionality in boys predicted later body dissatisfaction, although they did not control for baseline body dissatisfaction. On the other hand, Holsen and colleagues (2001), after controlling for Time 1 body dissatisfaction, did not find depression prospectively predicted body dissatisfaction in girls or boys. Despite a consistently strong cross-sectional relationship between body dissatisfaction and low self-esteem, few studies have examined the role of self-esteem as a prospective risk factor for increases in body dissatisfaction during adolescence after controlling for baseline body dissatisfaction.

Research Aims

Cash (2002) has theorized that causes of body dissatisfaction are likely to be both historical (e.g., BMI, teasing history, and self-esteem) and proximal (everyday experiences that activate negative body image schema). Within this context, it is likely that different risk factors might be identified using different follow-up periods. In particular, longer follow-up periods are more likely to detect more historical factors and those relatively stable within an individual or environment, whereas shorter follow-up periods may detect specific or precipitating risk factors. Only three studies that control for baseline body dissatisfaction, however, have used long-term follow-up periods of 3–8 years (Cattarin & Thompson, 1994; Holsen et al., 2001; Ohring et al., 2002). In addition, only one has studied boys (Holsen et al., 2001), and as physical and psychological development and social and appearance pressures differ between girls and boys, and as short-term follow-up studies have found differences in predictor variables for females and males, there may also be differences between girls and boys in long-term predictors. Further, none of the studies with a longer term follow-up have simultaneously examined BMI, sociodemographic factors, family and peer weight and shape environments, and psychological variables as observed in shorter follow-up studies (e.g., Presnell et al., 2004), and examination of univariate effects alone may provide a misleading picture.

Finally, there are marked differences in psychosocial development, role expectations, and social pressures during early to middle adolescence and during middle to late adolescence that may result in different patterns of prospective risk factors for body dissatisfaction in these different developmental stages. For example, during early years of adolescence, most girls and boys experience marked physical changes associated with puberty (Tanner, 1989). In addition, typically during these years while the family environment remains very important, there is a strong peer orientation and high importance placed on peer acceptance (Berndt & Hestenes, 1996). During later years of adolescence and young adulthood, however, typically there are continued but fewer physical changes (Whitbourne, 2002), greater interest in heterosexual relationships (Levesque, 1993), greater independence, and the challenges of moving into adult environments in tertiary education and the workplace (Whitbourne, 2002). In light of such marked developmental differences, we aimed to explore potential differences in predictors of increases in body dissatisfaction in these different phases.

In summary, the present study extended existing research into prospective risk factors for body dissatisfaction by using a relatively long follow-up time of 5 years; examining a range of physical, sociocultural, and psychological variables simultaneously as potential risk factors for increases in body dissatisfaction; studying both girls and boys; and including youth at two different developmental stages. Cohorts of early and middle adolescents, each containing girls and boys, involved in the Eating Among Teens Project (Project EAT-I) were reassessed after 5 years (Project EAT-II). The central aim of the study was to examine whether psychosocial variables (parent dieting environment, friend dieting and peer teasing, self-esteem, and depression) would predict increases in body dissatisfaction after initial body dissatisfaction, BMI (the most consistent predictor of increased body dissatisfaction), and demographic variables (socioeconomic status [SES] and ethnicity) were taken into account. A further aim was to examine predictors of increases in body dissatisfaction in early and middle adolescent girls and boys separately, so that different patterns of predictors could be identified in these groups. Guided by previous research, we hypothesized that BMI would predict increases in body dissatisfaction and being African American would protect against increases in body dissatisfaction in all groups. In addition, we hypothesized that friend dieting and peer teasing would predict increases in body dissatisfaction in female samples, whereas depression would predict increases in body dissatisfaction in male samples. As existing theory and research provided little guidance about potential differences in risk factor roles of parent dieting environment and self-esteem in girls compared with boys at different developmental stages, no specific hypotheses were made in relation to these variables.

Method

Participants

Project EAT-I was established as a large epidemiological study of socioenvironmental, personal, and behavioral determinants of dietary intake and weight status among adolescent girls and boys from diverse ethnic and socioeconomic backgrounds (Neumark-Sztainer, Story, Hannan, & Croll, 2002). Junior and senior high school students in 31 Minnesota schools ($N = 4,746$) completed in-class surveys and anthropometric mea-

tures during the 1998–1999 academic year. Project EAT-II aimed to resurvey all original participants 5 years later (2003–2004) as the early adolescent cohort progressed from early adolescence (junior high school) to middle adolescence (high school), while the middle adolescent cohort progressed from middle adolescence (high school) to late adolescence (post-high school).

For Project EAT-II, surveys were mailed to the address provided by participants during Project EAT-I. If the survey was not returned, subsequent mailings included two reminder postcards, an additional survey, a second survey sent by Federal Express, and a final survey sent in a neon-colored envelope with a mechanical pencil with which to complete the survey. If mail was returned because of an incorrect address, Internet tracking services were used to identify a current address where possible, and the mailing procedure recommenced. The University of Minnesota's Institutional Review Board Human Subjects Committee approved all protocols.

Following these procedures, 1,074 (22.6%) of the Project EAT-I sample were lost to follow-up for several reasons, including missing contact information at Project EAT-I ($N = 411$) and no address found at follow-up ($N = 591$). Of the remaining 3,672 participants contacted by mail, 2,516 completed surveys, representing 52.0% of the original cohort and 68.4% of participants who were contactable for Project EAT-II. The final sample of adolescents who completed valid surveys in both Project EAT-I (Time 1) and Project EAT-II (Time 2) consisted of 440 girls in the early adolescent cohort (Time 1 mean age = 12.7 years, $SD = 0.74$), 366 boys in the early adolescent cohort (Time 1 mean age = 12.8 years, $SD = 0.76$), 946 girls in the middle adolescent cohort (Time 1 mean age = 15.8 years, $SD = 0.81$), and 764 boys in the middle adolescent cohort (Time 1 mean age = 15.9 years, $SD = 0.78$). The ethnic–racial background of the sample was 61.9% European American, 11.1% African American, 4.5% Hispanic, 17.8% Asian, 1.9% Native American, and 2.7% of mixed or other ethnicity. There was also diversity in SES: 13% low, 17% middle–low, 25% middle, 28% middle–high, and 17% high SES.

Measures

Body dissatisfaction. Time 1 and Time 2 body dissatisfaction were assessed with a modified version of the Body Shape Satisfaction Scale (Pinguire, Spring, & Garfield, 1997). Each respondent rated his or her satisfaction with 10 aspects of his or her body shape and parts (e.g., height, weight, body shape, waist, body build, and shoulders) on 5-point Likert scales ranging from 1 (*very satisfied*) to 5 (*very dissatisfied*). Responses on each item were summed. Cronbach's alpha at Time 1 was .92 and at Time 2 was .93. Higher scores indicated greater dissatisfaction.

Weight status. Height and weight were measured using standardized equipment and procedures used to calculate BMI (weight in kilograms divided by the square of height in meters). Because 11% of girls and 10% of boys were missing observed height and weight, self-reported height and weight were substituted in these cases to reduce the missing percentage to 3% of girls and 2.5% of boys, as the self-reported and observed measures were highly correlated (girls: $r = .85, p < .001$; boys: $r = .88, p < .001$).

Demographic variables. Gender, age, ethnicity, and SES were based on Time 1 self-report. The original seven-category ethnicity variable was collapsed into three categories of European American, African American, and other–mixed ethnicity for use in analyses. The prime determinant of SES was parental education level, defined by the highest level of educational attainment of either parent. Other variables taken into account in assessing family SES included family eligibility for public assistance, eligibility for free or reduced-cost school meals, and employment status of the mother and father (Neumark-Sztainer, Story, Hannan, & Croll, 2002).

Parent dieting environment. A scale assessing parent dieting environment was constructed with four items. The following statements were rated on 4-point scales ranging from 1 (*not at all*) to 4 (*very much*): “My mother/father diets to lose weight or keep from gaining weight” (two items) and “My mother/father encourages me to diet to control my weight”

(two items). A scale score was created by taking the mean of these items. Cronbach's alpha was .75, and higher scores indicated greater perceived parental involvement in dieting. However, because this scale was positively skewed, it was dichotomized at the 25th percentile for use in multivariate analyses. Thus, participants with a scale score of 1 (corresponding to the *not at all* response) were compared with those with higher scores.

Peer environment. A single item, rated on a 4-point scale ranging from 1 (*not at all*) to 4 (*very much*), assessed perceived friend dieting: “Many of my friends diet to lose weight or keep from gaining weight.” There was also a fifth option: “I don't know.” For the regression analyses, responses of *somewhat* and *very much* were combined because of relatively low numbers endorsing *very much*, and in analyses conducted using this item, respondents checking “I don't know” were not included. Two items measured the frequency of being teased about weight and appearance on 5-point scales ranging from 1 (*never*) to 5 (*at least once a week*). These were combined into a mean weight teasing score, with higher scores indicating more frequent teasing.

Psychological variables. Self-esteem was assessed with a shortened version of the Rosenberg Self-Esteem Inventory (Rosenberg, 1965), which contained six items, such as “On the whole, I am quite satisfied with myself,” and was rated on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Higher scores indicated higher self-esteem, and the scale had a Cronbach's alpha of .78. Depressive mood was assessed with a six-item scale assessing depressive symptoms (Kandel & Davies, 1982) such as “During the past 12 months, how often have you been bothered or troubled by feeling unhappy, sad, or depressed?” Each item was rated on a 3-point scale ranging from 1 (*not at all*) to 3 (*very much*), and item responses were summed (Cronbach's $\alpha = .75$). Higher scores indicated more depressive symptoms.

Data Analysis

Initially, Pearson product–moment correlations were used to identify bivariate associations between Time 1 predictors and Time 2 body dissatisfaction, and relationships among predictors were examined for multicollinearity. To examine the predictive contribution of psychosocial factors after Time 1 body dissatisfaction, we adopted a model-building approach over several stages using multivariable linear regression analyses and taking BMI and demographic variables into account. The first model included Time 1 body dissatisfaction as the only independent variable. BMI was added in the second model, and SES and ethnicity were added subsequently to create a baseline model to which additional variables could be added. Next, three separate models were created, which added (a) the parent dieting environment score, (b) two peer environment variables, or (c) two psychological variables to the baseline model. Finally, a reduced model was created, in which Time 1 body satisfaction was used as a predictor as well as all other variables, which had significance levels of $p < .20$ in the previous set of models. This criterion was set so as to ensure no relevant variables were omitted.

All analyses were stratified by gender and age cohort, because of previous research suggesting differences in several predictor variables across gender or age groups. This approach allows the relationship between all covariates and Time 2 body dissatisfaction to vary across both gender and age, and it avoids the use of multiple, complex interaction terms in each regression model. This strategy therefore identifies a unique set of predictors and estimates their collective predictive power, within each group.

Comparisons of Project EAT-I participants who did and did not respond to Project EAT-II indicated several small but significant differences. Project EAT-II participants were more likely than nonparticipants to be female, in the older age group, European American, in upper SES categories, and in the healthy BMI range. Consequently, in all analyses, data were weighted to adjust for differential response rates using the response pro-

Table 1
Means and Standard Deviations of Time 1 and Time 2 Body Dissatisfaction and Time 1 Body Mass Index, Parent Dieting Environment, Friend Dieting, Weight Teasing, and Psychological Variables

Predictor variable	Scale range	Early adolescents				Middle adolescents			
		Girls		Boys		Girls		Boys	
		M	SD	M	SD	M	SD	M	SD
Body dissatisfaction Time 1	10–50	26.70	9.92	22.64	9.21	28.77	9.14	22.94	8.49
Body dissatisfaction Time 2	10–50	28.43	9.59	24.44	9.17	28.90	8.99	25.46	8.55
Body mass index		22.11	4.73	21.49	5.03	23.42	4.68	23.70	4.66
Parent dieting environment	1–4	1.80	0.84	1.88	0.85	1.67	0.68	1.74	0.70
Friend dieting	1–4	2.18	1.05	1.72	0.95	2.30	0.98	1.71	0.90
Weight teasing	1–5	2.13	1.20	1.97	1.15	1.94	1.06	1.91	1.02
Self-esteem	6–24	17.71	3.51	18.60	3.56	17.20	1.06	19.07	3.39
Depression	6–18	10.40	2.67	9.35	2.69	13.00	3.10	11.30	2.71

pensity method (Little, 1986), in which the inverse of the estimated probability that an individual responded at Time 2 was used as the weight. Thus, all Time 2 estimates were generalizable to the population represented by the original Project EAT-I sample. Analyses were conducted with SAS 8.2 (SAS Institute, 1999).

Results

Characteristics of Sample and Univariate Correlates of Time 2 Body Dissatisfaction

Participant characteristics are summarized in Table 1. Univariate correlations between putative Time 1 risk factor variables and Time 2 body dissatisfaction were examined (see Table 2). All proposed risk factors, except parent dieting environment and friend dieting in the early adolescent boys and friend dieting in the older girls, were correlated with Time 2 body satisfaction.

Prospective Predictors of Increase in Body Dissatisfaction

Early adolescent girls. Table 3 summarizes findings from the multivariable linear regression analyses conducted for the early adolescent girls in which Time 2 body dissatisfaction was the dependent variable. Model 1, in which only Time 1 body dissatisfaction was entered, was significant. In Model 2, after Time 1 body dissatisfaction had been entered, BMI was a significant unique predictor of Time 2 body dissatisfaction. In the baseline model, in addition to Time 1 body dissatisfaction and BMI, SES, being African American, and being of other-mixed ethnicity were entered into the regression. However, none of the demographic variables made unique contributions to the model. The first variable added to the baseline model was parent dieting environment. However, parent dieting did not contribute uniquely to the model. Next, the two peer variables were added to the baseline model, and friend dieting was observed to be a unique predictor of Time 2 body dissatisfaction. Finally, the two psychological variables were added to the baseline model, and self-esteem was observed to be a unique negative predictor of Time 2 body dissatisfaction.

In the reduced model shown at the bottom of Table 3, Time 1 body satisfaction, BMI, friend dieting, and self-esteem were entered into the regression equation. It is interesting to note that Time 1 body dissatisfaction was not a significant unique predictor in this

model. However, in other respects, the results paralleled the previous analysis, with Time 1 BMI, friend dieting, and self-esteem prospectively predicting Time 2 body satisfaction.

Early adolescent boys. Prospective predictors of Time 2 body dissatisfaction in early adolescent boys were examined (see Table 4). Model 1, in which Time 1 body dissatisfaction only was entered, was significant. When Time 1 body dissatisfaction and BMI were entered together in Model 2, both variables contributed uniquely to the variance in Time 2 body dissatisfaction. When the baseline model was examined, in which Time 1 body dissatisfaction, BMI, SES, and ethnicity were entered, Time 1 body dissatisfaction was no longer a unique predictor, but BMI and SES were unique predictors, with higher BMI and lower SES predicting greater Time 2 body dissatisfaction. When added to the baseline model, parent dieting environment did not make a unique contribution to Time 2 body dissatisfaction. However, when the peer variables were entered, weight teasing was a unique, significant predictor of Time 2 body dissatisfaction. Finally, when added to the baseline model, neither self-esteem nor depression made a unique contribution to the prediction of Time 2 body dissatisfaction. In the reduced model of predictors of Time 2 body dissatisfaction, Time 1 body dissatisfaction, BMI, SES, weight teasing, and depression were entered into the analysis. BMI and SES were

Table 2
Pearson's Product-Moment Correlations Between Time 2 Body Dissatisfaction and Putative Time 1 Risk Factor Variables

Time 1 variable	Early adolescents		Middle adolescents	
	Girls	Boys	Girls	Boys
Body dissatisfaction	.35***	.22***	.48***	.42***
Body mass index	.27***	.20***	.31***	.27***
Socioeconomic status	-.11*	-.22***	-.15***	-.12**
Parent dieting environment	.18***	.10	.15***	.07*
Friend dieting	.24***	.07	.05	.13***
Weight teasing	.11*	.16**	.17***	.19***
Self-esteem	-.32***	-.21***	-.29***	-.22***
Depression	.24***	.11*	.15***	.21***

* p ≤ .05. ** p ≤ .01. *** p ≤ .001.

Table 3
Summary of Multivariable Models for Early Adolescent Girls

Predictor variable	β	SE	t
Model 1: $F(1, 420) = 60.19^{***}, R^2 = .13$			
Body dissatisfaction	0.35	0.05	7.76***
Model 2: $F(2, 410) = 36.62^{***}, R^2 = .15$			
Body dissatisfaction	0.28	0.05	5.86***
Body mass index	0.40	0.10	4.21***
Baseline model: $F(3, 387) = 14.85^{***}, R^2 = .16$			
Body dissatisfaction	0.30	0.05	6.16***
Body mass index	0.32	0.10	3.18**
SES	-0.10	0.36	-0.29
African American	-0.25	1.22	-0.21
Other-mixed ethnicity	0.75	1.14	0.66
Baseline model plus parent environment: $F(6, 383) = 12.23^{***}, R^2 = .16$			
Body dissatisfaction	0.30	0.05	5.94***
Body mass index	0.31	0.10	2.96**
SES	-0.09	0.37	-0.25
African American	-0.28	1.22	-0.23
Other-mixed ethnicity	0.87	1.15	0.76
Parent dieting environment	0.67	1.05	0.59
Baseline model plus peer environment: $F(7, 288) = 7.00^{***}, R^2 = .15$			
Body dissatisfaction	0.25	0.06	4.14***
Body mass index	0.19	0.12	1.64
SES	-0.28	0.41	-0.68
African American	-0.87	1.37	-0.63
Other-mixed ethnicity	0.24	1.27	0.19
Friend dieting	1.62	0.64	2.53*
Weight teasing	-0.54	0.46	-1.19
Baseline plus psychological variables: $F(7, 372) = 11.93^{***}, R^2 = .18$			
Body dissatisfaction	0.19	0.06	3.27***
Body mass index	0.30	0.10	2.97**
SES	0.35	0.37	0.95
African American	0.54	1.22	0.45
Other-mixed ethnicity	0.92	1.13	0.82
Self-esteem	-0.52	0.17	-3.11**
Depression	0.23	0.20	1.13
Reduced model: $F(4, 305) = 14.81^{***}, R^2 = .16$			
Body dissatisfaction	0.05	0.06	0.84
Body mass index	0.28	0.11	2.64**
Friend dieting	1.45	0.62	2.33*
Self-esteem	-0.68	0.17	-4.08***

Note. Degrees of freedom differ in each analysis because of differences in missing data or, in the case of friend dieting, an "I don't know" response. SES = socioeconomic status.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

the only variables to make significant unique contributions to the model.

Middle adolescent girls. In middle adolescent girls (see Table 5), Model 1, in which Time 1 body dissatisfaction was entered alone, was significant. In Model 2, both body dissatisfaction and

BMI made significant unique contributions to Time 2 body dissatisfaction. In the baseline model, Time 1 body dissatisfaction, BMI, SES (inversely), and being African American (inversely) contributed uniquely to the variance. Neither parent dieting nor

Table 4
Summary of Multivariable Models for Early Adolescent Boys

Predictor variable	β	SE	t
Model 1: $F(1, 338) = 18.17^{***}, R^2 = .05$			
Body dissatisfaction	0.23	0.05	4.26***
Model 2: $F(2, 332) = 9.34^{***}, R^2 = .05$			
Body dissatisfaction	0.15	0.06	2.43*
Body mass index	0.27	0.10	2.55*
Baseline model: $F(5, 313) = 7.50^{***}, R^2 = .11$			
Body dissatisfaction	0.06	0.06	1.02
Body mass index	0.39	0.10	3.92***
SES	-1.10	0.45	-2.44*
African American	0.32	1.36	0.23
Other-mixed ethnicity	1.02	1.17	0.88
Baseline model plus parent environment: $F(6, 310) = 6.38^{***}, R^2 = .11$			
Body dissatisfaction	0.03	0.06	0.58
Body mass index	0.42	0.10	4.16***
SES	-1.09	0.45	-2.40*
African American	0.41	1.35	0.31
Other-mixed ethnicity	1.19	1.16	1.03
Parent dieting environment	-0.15	1.17	-0.13
Baseline model plus peer environment: $F(7, 214) = 6.32^{***}, R^2 = .17$			
Body dissatisfaction	0.05	0.06	0.85
Body mass index	0.28	0.13	2.17*
SES	-1.04	0.47	-2.24*
African American	2.07	1.67	1.24
Other-mixed ethnicity	1.49	1.24	1.20
Friend dieting	-0.38	0.68	-0.55
Weight teasing	1.48	0.50	2.98**
Baseline model plus psychological variables: $F(7, 300) = 5.64^{***}, R^2 = .12$			
Body dissatisfaction	0.02	0.06	0.28
Body mass index	0.42	0.11	3.93***
SES	-1.11	0.46	-2.41*
African American	0.28	1.38	0.20
Other-mixed ethnicity	0.42	1.19	0.35
Self-esteem	-0.09	0.17	-0.55
Depression	0.30	0.21	1.43
Reduced model: $F(5, 307) = 7.86^{***}, R^2 = .11$			
Body dissatisfaction	0.00	0.06	0.07
Body mass index	0.39	0.11	3.56***
SES	-1.22	0.42	-2.90**
Weight teasing	0.49	0.46	1.05
Depression	0.29	0.19	1.53

Note. Degrees of freedom differ in each analysis because of differences in missing data or, in the case of friend dieting, an "I don't know" response. SES = socioeconomic status.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 5
Summary of Multivariable Models for Middle Adolescent Girls

Predictor variable	β	SE	<i>t</i>
Model 1: $F(1, 911) = 278.46^{***}$, $R^2 = .23$			
Body dissatisfaction	0.46	0.03	16.69***
Model 2: $F(2, 897) = 155.83^{***}$, $R^2 = .26$			
Body dissatisfaction	0.40	0.02	13.49***
Body mass index	0.32	0.06	5.77***
Baseline model: $F(5, 882) = 69.28^{***}$, $R^2 = .28$			
Body dissatisfaction	0.37	0.03	12.28***
Body mass index	0.32	0.06	5.78***
SES	-0.85	0.22	-3.83***
African American	-2.04	0.79	-2.58**
Other-mixed ethnicity	0.10	0.64	1.56
Baseline model plus parent environment: $F(6, 876) = 57.95^{***}$, $R^2 = .28$			
Body dissatisfaction	0.37	0.03	12.37***
Body mass index	0.31	0.06	5.45***
SES	-0.88	0.22	-3.96***
African American	-1.99	0.80	-2.47**
Other-mixed ethnicity	0.96	0.64	1.50
Parent environment	0.34	0.59	0.58
Baseline model plus peer environment: $F(7, 790) = 45.59^{***}$, $R^2 = .29$			
Body dissatisfaction	0.41	0.03	12.32***
Body mass index	0.25	0.06	4.13***
SES	-0.90	0.23	-3.85***
African American	-1.58	0.89	-1.77
Other-mixed ethnicity	0.78	0.67	1.16
Friend dieting	-0.49	0.35	-1.43
Weight teasing	0.37	0.26	1.38
Baseline model plus psychological variables: $F(7, 864) = 46.37^{***}$, $R^2 = .27$			
Body dissatisfaction	0.32	0.03	9.29***
Body mass index	0.32	0.06	5.57***
SES	-0.85	0.22	-3.82***
African American	-1.97	0.80	-2.48*
Other-mixed ethnicity	0.79	0.65	1.23
Self-esteem	-0.22	0.10	-2.22*
Depression	-0.04	0.11	-0.40
Reduced model: $F(8, 779) = 39.24^{***}$, $R^2 = .29$			
Body dissatisfaction	0.39	0.04	10.33***
Body mass index	0.25	0.06	4.21***
SES	-0.92	0.24	-3.91***
African American	-1.60	0.90	-1.79
Other-mixed ethnicity	0.67	0.68	0.98
Friend dieting	-0.50	0.35	-1.43
Weight teasing	0.26	0.28	0.92
Self-esteem	-0.10	0.10	-1.04

Note. Degrees of freedom differ in each analysis because of differences in missing data or, in the case of friend dieting, an "I don't know" response. SES = socioeconomic status.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

peer environment variables, when added to the baseline model, made significant unique contributions to the prediction of Time 2 body dissatisfaction. However, when self-esteem and depression were added to the baseline model, self-esteem made a significant unique contribution to the prediction of Time 2 body dissatisfaction. In the reduced model for middle adolescent girls, Time 1 body dissatisfaction, BMI, SES, being African American, being of other-mixed ethnicity, friend dieting, weight teasing, and self-esteem were entered into the model. In this analysis, significant unique predictors of Time 2 body dissatisfaction were Time 1 body dissatisfaction, BMI, and SES.

Middle adolescent boys. Finally, predictors of Time 2 body dissatisfaction in middle adolescent boys were examined (see Table 6). Model 1 was significant and in Model 2, both Time 1 body dissatisfaction and BMI were significant unique predictors of Time 2 body dissatisfaction. When the baseline model was examined, Time 1 body dissatisfaction and BMI positively contributed to the model, whereas being African American and being of other-mixed ethnicity were unique inverse predictors of Time 2 body dissatisfaction. When added to the baseline model, neither parent dieting nor peer variables made significant contributions to the variance explained. However, when the psychological variables were entered, depression made a unique contribution to the model. The variables entered into the reduced model for middle adolescent boys were Time 1 body dissatisfaction, BMI, being African American, being of other-mixed ethnicity, and depression. Each of these variables made significant unique contributions to the prediction of Time 2 body dissatisfaction.

Discussion

This study examined prospective risk factors for increases in body dissatisfaction in girls and boys over a relatively long time period of 5 years, in two different developmental phases, from early to middle adolescence and from middle to late adolescence. Predictors of Time 2 body dissatisfaction were examined in each group separately in order to facilitate identification of different patterns of predictors. Time 1 body dissatisfaction, when entered alone, was a significant prospective predictor of Time 2 body dissatisfaction in all groups. However, in the reduced models, Time 1 body dissatisfaction was not a significant predictor in early adolescent girls and boys. As hypothesized and consistent with previous research, BMI was a predictor of increases in body dissatisfaction in all samples. Of the demographic variables examined, SES inversely predicted Time 2 body dissatisfaction in early adolescent boys and middle adolescent girls. Partially consistent with our hypothesis, being African American predicted a lower increase in body dissatisfaction in both boys and girls in the middle but not in the early adolescent cohort. Parent dieting was not a prospective predictor in any group. However, in partial support of our hypothesis, in early adolescence, friend dieting and weight teasing predicted an increase in body dissatisfaction in girls and boys, respectively, but this was not the case in the older cohort. Partially consistent with our hypothesis, depression positively predicted Time 2 body dissatisfaction in middle adolescent boys. Finally, self-esteem inversely predicted increases in body dissatisfaction in both young and middle adolescent girls.

In this multivariable analysis of prospective risk factors of Time 2 body dissatisfaction, Time 1 body dissatisfaction was controlled

Table 6
Summary of Multivariable Models for Middle Adolescent Boys

Predictor variable	β	SE	t
Model 1: $F(1, 733) = 153.72^{***}$, $R^2 = .17$			
Body dissatisfaction	0.41	0.03	12.40***
Model 2: $F(2, 727) = 96.69^{***}$, $R^2 = .21$			
Body dissatisfaction	0.35	0.03	10.21***
Body mass index	0.36	0.06	5.83***
Baseline model: $F(5, 714) = 45.72^{***}$, $R^2 = .24$			
Body dissatisfaction	0.32	0.03	9.50***
Body mass index	0.38	0.06	6.10***
SES	-0.24	0.25	-0.97
African American	-3.01	0.85	-3.54***
Other-mixed ethnicity	2.00	0.76	2.65**
Baseline model plus parent environment: $F(6, 710) = 39.21^{***}$, $R^2 = .25$			
Body dissatisfaction	0.34	0.03	9.74***
Body mass index	0.38	0.06	6.11***
SES	-0.20	0.25	-0.83
African American	-2.94	0.84	-3.48***
Other-mixed ethnicity	2.04	0.75	2.73**
Parent dieting environment	-0.28	0.65	-0.43
Baseline model plus peer environment: $F(7, 606) = 26.66^{***}$, $R^2 = .24$			
Body dissatisfaction	0.35	0.04	8.72***
Body mass index	0.28	0.07	4.05***
SES	-0.16	0.27	-0.58
African American	-0.86	1.00	-0.86
Other-mixed ethnicity	2.48	0.82	3.02**
Friend dieting	0.49	0.40	1.23
Weight teasing	0.36	0.31	1.16
Baseline model plus psychological variables: $F(7, 703) = 35.14^{***}$, $R^2 = .26$			
Body dissatisfaction	0.30	0.04	7.69***
Body mass index	0.36	0.06	5.82***
SES	-0.30	0.25	-1.21
African American	-2.95	0.88	-3.33***
Other-mixed ethnicity	2.09	0.75	2.79**
Self-esteem	-0.06	0.10	-0.62
Depression	0.29	0.12	2.46*
Reduced model: $F(5, 716) = 49.63^{***}$, $R^2 = .26$			
Body dissatisfaction	0.31	0.04	8.58***
Body mass index	0.37	0.06	5.99***
African American	2.88	0.83	-3.46***
Other-mixed ethnicity	2.42	0.65	3.73***
Depression	0.33	0.11	3.03**

Note. Degrees of freedom differ in each analysis because of differences in missing data or, in the case of friend dieting, an "I don't know" response. SES = socioeconomic status.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

for by entering it into each of the models examined. Notably, however, in the reduced models examined in the early adolescent cohorts, Time 1 body dissatisfaction was not a unique predictor of Time 2 body dissatisfaction. This finding suggests that at this stage

of development when girls and boys are typically still growing physically and developing their identity, body dissatisfaction is not yet stable, and the development of body dissatisfaction is influenced to a greater extent by other physical, social, and individual attributes partially associated with body dissatisfaction at Time 1. This is not the case, however, for the middle adolescent cohort, in which Time 1 body dissatisfaction makes a strong contribution to the variance in Time 2 body dissatisfaction in the multivariable analyses. These findings support prevention efforts earlier rather than later in adolescence.

Consistent with most previous research (Field et al., 2001; Halpern et al., 1999; Ohring et al., 2002), BMI was a strong and consistent predictor of increases in body dissatisfaction in both developmental phases examined. The thin beauty ideal is propagated through media that reach all age groups and are consistent and pervasive (Levine & Harrison, 2004), and thinness is associated with popularity and sexual, relationship, and material success—issues pertinent to boys and girls across both developmental periods we examined. On the other hand, research has shown that overweight people suffer a variety of poor social outcomes, including job discrimination, social exclusion, mistreatment by doctors, public ridicule, and rejection of college admission and funding (Crandall, 1994; Latner, Stunkard, & Wilson, 2005; Puhl & Brownell, 2001; Schwartz, Chambliss, Brownell, Blair, & Billington, 2003). Against this cultural backdrop, it is not surprising that departure from this ideal is associated with increases in body dissatisfaction in our samples.

SES and ethnicity, most likely proxy variables for subcultural norms and attitudes, prospectively predicted increases in body dissatisfaction in different ways in the two cohorts. Lower SES prospectively predicted Time 2 body dissatisfaction in early adolescent boys and middle adolescent girls. Lower self-esteem is associated with lower SES (e.g., Rhodes, Roffman, Reddy, Fredriksen, & Way, 2004; Twenge & Campbell, 2002), which may also affect an adolescent's view of his or her body. Particularly in relation to the girls, a further explanation is that girls in lower SES may be less able to afford fashionable clothing that may impinge on body image more widely. It is not clear, however, why SES plays a role at different developmental phases in girls and boys, and further research is required to clarify the nature of these relationships.

African American ethnicity emerged as a protective factor against increases in body dissatisfaction in middle adolescence. These findings are consistent with cross-sectional studies that have observed that body satisfaction is higher in African American girls and boys in comparison with other ethnic groups in the U.S. (Akan & Grillo, 1995; Kelly et al., 2005; Neumark-Sztainer, Croll, et al., 2002; Neumark-Sztainer et al., 1999). The larger body size ideal in the African American subculture is more consistent with the natural shape of young women from middle to late adolescence, and consequently the extent of departure from this body shape ideal is likely to be less, offering protection against increases in body dissatisfaction. Less is known about body image among boys and men, particularly among males from different racial-ethnic backgrounds. Research has suggested that African American males are less likely than European American males to consider themselves overweight (Rand & Kuldau, 1990) and that, overall, males tend to desire more muscular shapes than they describe themselves as having (Pope et al., 2000). African American males may be more

likely to fit their ideal as they move into young adulthood, whereas those of other-mixed ethnicity, mainly Asian and Hispanic in this research, may be less likely to do so.

The parent dieting environment measure did not predict increases in body dissatisfaction in either cohort in this research. In a study by Field and colleagues (2001) that observed more frequent development of weight concerns when thinness was important to parents, the follow-up period was relatively short (1 year). Parent dieting environment factors may be more proximal influences and less relevant over a longer period. In addition, in cross-sectional studies, parent encouragement to diet (a component of parent dieting environment) has been closely associated with BMI (Wertheim et al., 1999, 2002). Thus, it may be the wider consequences of a higher BMI that are particularly important in the increase in body dissatisfaction over 5 years, rather than parent dieting attitudes and behaviors in particular. Further, from a developmental perspective, it would be anticipated that parent influences would be especially pertinent during childhood and that by adolescence, factors external to the family may become more salient in their effect.

Peer environment factors were prospective predictors of increases in body dissatisfaction from early to middle adolescence. In the early adolescent cohort of girls, friend dieting predicted increases in body dissatisfaction, a finding consistent with cross-sectional (e.g., Jones et al., 2004; Paxton et al., 1999) and longitudinal (Jones, 2004) research in which friend dieting concerns and appearance conversations have been associated with body dissatisfaction. Mechanisms involved in the relationship between appearance-concerned friendship environment and body dissatisfaction have yet to be fully elucidated. However, perceived friend concern with weight and conversations about appearance have been observed to be associated with enhanced internalization of the thin ideal and body comparisons (Jones, 2004; Jones et al., 2004; Schutz, Paxton, & Wertheim, 2002). Thus, the effect of friend dieting on increases in body dissatisfaction from early to middle adolescence may be mediated by these attributes.

It is notable that friend dieting was not a significant predictor of increases in body dissatisfaction in the middle adolescent cohort. Early to middle adolescence is a developmental phase especially associated with the need to feel accepted by peers, which may intensify the influence of peer factors on body image during this time (Brown, 2004; Perry, 2001). In addition, for many of the middle adolescent cohort, participants' friendship environment may have changed substantially over the 5-year period as a consequence of leaving school and moving into the young adult world. Changes in peer environments over middle to later adolescence may contribute to the weakening of peer influences on increases in body dissatisfaction during this developmental phase.

Weight teasing was a unique predictor of increases in body dissatisfaction in early adolescent boys when entered with the baseline model. However, its effect diminished when entered with depression in the reduced model, suggesting a mediating relationship between the two. Weight teasing not only asserts the norms of attractiveness in a group but it also asserts disapproval, criticism, and rejection. In light of this reality, dissatisfaction with the apparent source of the problem, the body, would seem a natural consequence, especially during this developmental phase during which peer acceptance and affiliation is a central developmental task. Observation of a prospective role for weight teasing earlier

but not later in adolescence is consistent with previous research finding weight teasing prospectively predicted bulimic symptoms in 7th-grade girls but not in older adolescents (Wertheim et al., 2001). However, weight teasing was also strongly correlated with Time 2 body dissatisfaction in the middle adolescent cohorts, and it is likely it was not a unique predictor because of its close association with BMI (Neumark-Sztainer, Falkner, et al., 2002). Further investigation is required to identify these relationships.

The final variables examined were the psychological variable, self-esteem, and depression. Although low self-esteem is typically correlated with body dissatisfaction, it has not previously been identified as a prospective risk factor for body dissatisfaction in girls. Identification of low self-esteem as a predictor in this study may relate to the longer follow-up period. The mechanisms through which self-esteem may operate need further exploration. However, low self-esteem may contribute to an increase in negative self-evaluation generally and in negative evaluation of the body particularly, over this time frame. Low self-esteem may also be a characteristic that, over an extended period, makes a girl vulnerable to more proximal pressures, such as environmental pressures to be thin, that have been shown to predict increases in body dissatisfaction over a 1-year period (Stice & Whitenton, 2002). Further, low self-esteem may contribute to a girl being more likely to internalize cultural ideals of success, including the thin beauty ideal, and to engage in body comparisons, attitudes, and processes that increase vulnerability to increases in body dissatisfaction (Durkin & Paxton, 2002).

Although Time 1 depression was correlated with Time 2 body dissatisfaction in all groups, it was only a unique predictor in middle adolescent boys, consistent with the research of Presnell and colleagues (2004). Thus, negative mood rather than a more general sense of self-worth appears particularly relevant to change in body dissatisfaction in this group. Depressive symptoms typically involve negative feelings about the self that are likely, over time, to include negative feelings toward body image. As with self-esteem, depression may increase vulnerability to real or perceived criticism and pressures to achieve the ideal body.

The amount of variance explained by the final reduced model varied widely between the early and middle adolescent cohorts, and both Time 1 body dissatisfaction and additional predictor variables contributed less to the prediction of Time 2 body dissatisfaction in early adolescents. Thus, although this research indicates that the variables described above played a part in increases in body dissatisfaction, in the early adolescent cohort especially, other factors that we did not assess were also clearly relevant. Other social, biological, and psychological factors, such as media exposure and pressure to be thin, internalization of the sociocultural thin beauty ideal, body comparison, and perfectionism, may also be prospective predictors. Further research is required to explore these factors.

A principal applied reason for risk factor research is to identify issues of relevance to prevention interventions. The present findings indicate the importance of intervention at least prior to middle adolescence if not earlier, before body dissatisfaction has become a stable feature of a person's make-up. The crucial role of BMI in the Western social context as a prospective risk factor for increases in body dissatisfaction across teenage years highlights the importance of healthy weight control for both physical and mental health. Unfortunately, to date, only limited success has been re-

ported in public health interventions for healthy weight maintenance (McGuire, Wing, Klem, & Hill, 1999). The fact that higher SES and being African American appear to be protective factors is not as negative for prevention as it may first appear. These demographic characteristics are likely to be markers for attitudinal norms, and if acceptance of a greater diversity in body ideals can be endorsed in one subculture, they can potentially be endorsed by another. In the early adolescent cohort, the present research suggests the importance of providing supportive peer environments. Few interventions to date appear to have made this a focus. Finally, interventions that raise self-esteem and reduce depression are likely to be valuable in reducing body dissatisfaction. Consistent with this proposal are the findings of O'Dea and Abraham (2000), who observed positive effects on body image in a program that emphasized building self-esteem. Early identification and treatment of depression may be especially beneficial in older boys.

The current study has a number of strengths that enhance our ability to draw meaningful conclusions from our findings. The study population was larger and more diverse than other prospective studies examining predictors of body dissatisfaction (Wertheim et al., 2004), thus allowing for extrapolations to both genders and to lower income and ethnically diverse populations. The broad array of measures facilitated testing of a multivariable, psychosocial model of increases in body dissatisfaction. The 5-year follow-up period enabled an examination of longer term risk factors for increases in body dissatisfaction. Finally, the two-cohort design facilitated an examination of risk factors at two key developmental transitions, early to middle adolescence and middle to late adolescence.

However, the study also has limitations that need to be taken into account in interpreting the findings. There was substantial attrition between the two testing occasions, which may introduce bias into the data. Specifically, at Time 2, the sample was more likely to be European American and in the upper SES categories compared with the Time 1 sample. This likely is due to the greater mobility of participants in the lower SES and non-European American groups, who were heavily represented in the original Project EAT sample. Population weights reflecting the original sample were therefore used in all analyses to address this shortcoming and allow inferences to the original study population. Nevertheless, lower rates of attrition would have been preferable given the limitations of statistical adjustments and to allow for greater power from a larger sample size. Furthermore, although the original study population was large and diverse, it was not representative of all U.S. adolescents; thus, extrapolations to populations outside of the sample should be made cautiously. A further limitation relates to the range of variables assessed and the instruments used. Although a range of potential predictor variables selected on theoretical and empirical grounds was used in this research, as indicated above, important predictors may have been omitted, such as media pressure and internalization of the thin ideal. Further, being part of a larger epidemiological project, the measures were kept as short as possible. In particular, in future research, examination of peer influences using a more extensive instrument would be beneficial. Except in the case of BMI, which was measured, only self-report assessments were used. Ideally, more objective measures would be obtained, but compromises are required to obtain a substantial sample. Finally, this research aimed to identify prospective predictors of body dissatisfaction. It is likely that these predictors

interact in a range of complex ways, some variables potentially mediating or moderating the impact of other variables on body dissatisfaction. For example, effects may differ according to ethnicity or age. Future research, using different analytical strategies, is required to explore any mediating pathways or interaction effects among the predictors identified here.

In conclusion, the current research identified prospective predictors of increases in body dissatisfaction over a 5-year period in adolescent girls and boys. During the early adolescent phase, there is less stability in body dissatisfaction and greater influence of peer factors in its development. Over this 5-year time frame, self-esteem is a prospective risk factor in girls but not in boys, for whom depression was more influential in the middle adolescent cohort. Finally, the present research highlights the need to consider demographic factors in longitudinal research such as being African American and being from a higher SES as protective at different stages of development.

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