How Mixed-Sex Interactions Influence Girls’ Decisions to Diet: A Mediation Analysis

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Abstract

The prevalence rate of disordered eating is increasing especially rapidly among adolescents. This is alarming given that early weight- and body-related concerns may set adolescent girls on a path to continued and lifelong eating problems. Prior research has established a link between heterosocial involvement and dieting behaviors. The authors hypothesized that pressure to be thin and body dissatisfaction account for this relation, and they tested this hypothesis via a cross-sectional, mediational study of 90 adolescent girls in the 8th grade. Results of structural equation modeling supported the hypothesis, identifying peers as important targets in the prevention of maladaptive eating patterns. Interventions with young adolescents should include training in how to maintain a positive body image amidst different sociocultural pressures.
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The prevalence rate of eating disorders and their symptoms is astounding, and unfortunately, has increased substantially over the past few decades (Cauffman & Steinberg, 1996). At some point in their lives, anywhere from .5 to 3.7% of women will suffer from anorexia nervosa and 1.1 to 4.2% will experience bulimia (American Psychiatric Association Work Group on Eating Disorders, 2000). Additionally, at any one time, between half and two thirds of all American high school girls are on a diet, many of them unnecessarily (Rosen & Gross, 1987; Rosen, Tacy, & Howell, 1990). Disordered eating and problematic body-related attitudes are increasing especially rapidly among adolescents, which is alarming given the fact that these cognitions and behaviors may set adolescent girls on a path to continued and lifelong eating problems (Eisele, Hertsgaard, & Light, 1986; Graber, Brooks-Gunn, Paikoff, & Warren, 1994; U.S. Department of Health and Human Services, 2000). Adolescent girls often struggle with a variety of weight- and body-related concerns, ranging from excessive dieting and body dissatisfaction to diagnosable eating disorders. Such problems are considered the third most prevalent chronic illness among adolescents, after obesity and asthma (Fisher et al., 1995; Lucas, Beard, O’Fallon, & Kurland, 1991; Soundy, Lucas, Suman, & Melton, 1995).

Concerns with weight, shape, and dieting have been suggested as risk factors for eating disorders of at least subsyndromal severity (Taylor et al., 1998). However, the specific causes of eating disorders are not yet discerned, but there do appear to be both genetic and social influences. In attempting to identify specific risk factors for these problems, researchers often work within a “biopsychosocial” framework, which encompasses numerous factors, including one’s genetic predisposition, internalization of the thin ideal body image, perceptions of the
importance of attractiveness for social success, media, family, peer pressures, and shape and weight teasing (e.g., Groesz, Levine, & Murnen, 2002; Keery, van den Berg, & Thompson, 2004; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Wertheim, Paxton, & Blaney, 2004).

The purpose of the present study was to examine one specific factor within the biopsychosocial framework, namely, peer relations (Polivy & Herman, 2002). In a recent study, Compian, Gowen, and Hayward (2004) explored the relationship between involvement with boys and negative outcomes in adolescent girls. Early adolescence is typically the time when involvement with the opposite sex becomes especially salient (Hansen, Christopher, & Nangle, 1992). It appears that by middle school, interest in both friendships and romantic relationships with the opposite sex increases, particularly among girls (Savin-Williams & Berndt, 1990).

Despite adolescent girls’ intrinsic desire to associate with their male counterparts, such heterosocial interactions may negatively influence girls’ psychological adjustment and academic achievement (American Association of University Women [AAUW], 1992; Sommers, 2000). In fact, research suggests that involvement with boys may have a negative influence on girls in terms of their academic achievement (Sadker & Sadker, 1994), self-esteem (Simmons, Burgeson, Carlton-Ford, & Blyth, 1987), and body image satisfaction (Oliver & Thelen, 1996; Smolak, Levine, & Gralen, 1993). Thus, the number of single-sex classrooms and schools are growing at an unprecedented rate, in an effort to keep boys and girls apart as much as possible (Lewin, 1997). In general, beliefs regarding the importance of thinness to having a boyfriend, dating, and being popular are what make interactions with boys potentially harmful to girls and have been described as “dating concern” (Gralen, Levine, Smolak, & Murnen, 1990).
As Compián, Gowen, and Hayward (2004) also pointed out, during adolescence, girls begin to form relationships, in both the platonic and romantic senses. In early adolescence, boys and girls move from the same-sex “gang,” typical of children between the ages of 6 and 12, to larger mixed-sex friendship “crowds” (Dunphy, 1969). The crowd provides a tentative, exploratory, and experimental group where dating rituals and behaviors can be practiced for the first time (Smith, Udry, & Morris, 1985). Although Dunphy’s specific developmental stages have not been empirically validated, there is agreement that peer groups undergo considerable reorganization during this period, transitioning from the strict single-sex groups of childhood to mixed-sex groups in adolescence (Brown, 1990; Maccoby, 1998). However, adolescents themselves are often confused as to whether they are involved in a platonic or romantic relationship. Thus, our understanding of these strictly platonic interactions is relatively unclear. Romantic dating, which girls in the United States begin to partake in around the age of 12 or 13, appears to be most problematic (Cauffman & Steinberg, 1996).

Although some speculate that pubertal maturation is what leads to the onset of many girls’ eating problems, it is possible that this correlation between pubertal maturation and disordered eating may not be due to puberty per se, but rather to other developmental changes that coincide with physical development, namely, the onset of heterosocial activity. Much of the previous research on this topic and its relationship to disordered eating has centered on girls in their early teens experiencing the simultaneous onsets of dating and menarche (Cauffman & Steinberg, 1996; Smolak et al., 1993). For example, Smolak and colleagues (1993) found that girls who were romantically involved with boys at an early age reported greater body dissatisfaction than girls who were not dating. They also found that girls who simultaneously began dating and experienced menarche had higher body dissatisfaction and disordered eating
scores than girls who had not begun both at the same time. Further, Cauffman and Steinberg (1996) found that when age and menarche were controlled for, 12- and 13-year-old girls who dated were still significantly more likely to diet in comparison to their counterparts. These researchers were the first to recognize that a certain type of developmental change usually accompanied the onset of puberty: heterosocial activity. Therefore, it seems logical that girls who experience menarche would be more likely to be dissatisfied with their bodies, as these two landmark developmental changes (i.e., onset of puberty and heterosocial involvement) occur around the same time. Using a scale that assessed a range of heterosocial involvement from low to high (i.e., from no socializing with boys, meeting boys in groups, going out with a boy at night, to going steady with a boy), Cauffman and Steinberg (1996) found that increased amounts of activity correlated with higher levels of dieting and disordered eating.

While participating in these new mixed-sex activities, girls may feel different pressures from other girls and boys. First, girls often feel pressure from peers to be thin (Paxton, Norris, Wertheim, Durkin, & Anderson, 2005). In order to gain acceptance by their peers, adolescents may adopt the perceived beliefs and behaviors practiced by other members of the group (Paxton, Schutz, Wertheim, & Muir, 1999). Levine, Smolak, Moodey, Shuman, and Hessen (1994) found that adolescents often model the concerns about shape and weight management efforts of their peers. Even when girls are of a healthy weight, they are incredibly susceptible and likely to draw negative conclusions about their own shapes and weights when the behavior is modeled by a peer (Levine et al., 1994). As they start dating, girls also begin to form various cognitions regarding what they believe boys think about them. Current societal ideals of attractiveness value thinness above all else, as demonstrated by glorification of ultra-slim models.
(Thompson & Stice, 2001). Given our contemporary “thin-ideal” world, it is not surprising that many girls believe their own thinness is an important quality to boys.

Subtle sociocultural messages laud this supposed perfect body shape and may promote negative affect because of the numerous, redundant messages adolescent girls receive from their parents, peers, dating partners, and the media (Striegel-Moore, Silberstein, & Rodin, 1986). These sources all insinuate that one’s body is inadequate if not thin; thus, it is not surprising that many girls become disgruntled with their physical appearance. Interview studies have found that almost 50% of girls believe that boys preferred girls who were thin and that it would be very hard for a girl to be popular with boys if she was not (Nichter & Vuckovic, 1994; Wertheim, Paxton, Schutz, & Muir, 1997). A more recent study found that although the majority of boys do believe that thinness is an important characteristic associated with attractiveness in girls, boys’ appraisals of an ideal size for a girl were significantly larger than girls’ perceived assessments of boys’ ideal body size for them (Paxton et al., 2005). This suggests that although some degree of thinness is important to boys, they do not expect (and mostly likely do not want) girls to live up to the unrealistic images portrayed in the media.

As was previously alluded to, along with pressure to be thin, a large portion of adolescent girls also report body dissatisfaction during adolescence (Thompson et al., 1999). Body dissatisfaction refers to the affective component of body image; that is, how individuals feel about their bodies (Gleaves, Williamson, Eberenz, Sebastian, & Barker, 1995). This factor varies as a function of a girl’s actual body size and two other dimensions: body-size distortion and preference for thinness. That is, increased body-size distortion and/or decreased preference for thinness (controlling for actual body size) is associated with body dissatisfaction (Williamson, Gleaves, Watkins, & Schlundt, 1993). In fact, body dissatisfaction may be “one of
the most robust risk factors for eating disturbances” (Stice, 2001, p. 55). Involvement with peers may lead to body dissatisfaction through multiple pathways. For example, peers may encourage girls to strive for the thin ideal, or in their discussions with each other about weight and body concerns, may promote the idea that thinness is associated with happiness. Then, once girls realize that they are not “thin enough,” they become unhappy with their bodies. Compian, Gowen, and Hayward (2004) found that increasing levels of romantic involvement were correlated with lower body image satisfaction. Apart from this study though, the literature in this area is scarce, and thus, the results tenuous.

Indeed, the separate relationships between body dissatisfaction and dieting and pressure to be thin and dieting have been established. Many studies have found an association between body dissatisfaction and disordered eating behaviors (i.e., restricting diet, binge eating, and purging; Leon, Fulkerson, Perry, & Dube, 1994; Leung, Schwartzman, & Steiger, 1996; McVey, Pepler, Davis, Flett, & Abdolell, 2002; Thompson, Coovert, & Stormer, 1999). The relationship between pressure to be thin and dieting has also been demonstrated in adolescents (Stice, Shaw, & Nemeroff, 1998; Striegel-Moore, Schreiber, Pike, Wilfley, & Rodin, 1995; Thelen & Cormier, 1995).

Although a number of the aforementioned studies have underscored the separate relations between heterosocial involvement, pressure to be thin, body dissatisfaction, and dieting behaviors, what is not yet known is how heterosocial involvement may operate to affect dieting behaviors indirectly. Thus, the purpose of the present study was to examine the possible mediating roles of perceived pressure to be thin and body dissatisfaction in this relation. Research has indicated that body dissatisfaction is a robust predictor of maladaptive eating patterns such as engagement in unnecessary or unhealthy dieting, and some studies have shown
that heterosocial involvement may predict such dissatisfaction. Additionally, a perceived pressure to be thin may lead to disordered eating behaviors, which can also result from the mixed-sex activities that occur during adolescence. During this stage, girls are particularly vulnerable to the development of disordered eating patterns and are, at the same time, facing new social experiences (i.e., dating, hanging out in groups with both boys and girls).

**Hypotheses**

In the present study, we propose a model in which heterosocial involvement contributes to greater pressure to be thin and body dissatisfaction, which in turn lead to greater dieting behaviors among adolescent girls. Our specific mediational hypothesis was that heterosocial involvement would show no relation to dieting behavior after pressure to be thin and body dissatisfaction were included in the model as possible mediators. If the direct path between heterosocial involvement and engagement in dieting behaviors was no longer significant after these variables’ inclusion in our statistical model, then evidence of this mediation would be supported. This would then mean that heterosocial involvement would predict dieting behaviors, but only when one takes pressure to be thin and body dissatisfaction into account.

**Method**

**Participants**

Participants were 90 8th-grade girls ranging in age from 12 to 15 years ($M = 13.58$, $SD = .56$). Most identified as European American (92.2%); fewer identified as African American (1.1%), Latina (2.2%), Native American (2.2%), or “other” (1.1%). They came from primarily upper-middle class families. The annual household income per family ranged from $8,900 to $400,000 ($Md = $75,000, $M = $90,683, $SD = $69,159$). Their families had an average of 2.5 children, and most of the participants’ parents were married and living together (84.4%).
The present data were collected as part of a larger study focusing on the transitions that occur during adolescence. Initial contact letters were distributed through primary schools in a medium-sized Midwestern city. The letter briefly described the study and instructed mothers of 4th–graders to call the research office if interested in participating. Eligibility was determined by screening questions administered over the phone by research assistants, and dyads were excluded for numerous reasons (i.e., if the mother was remarried, separated, never married, or widowed or if the 4th–grader was not the oldest child in the family). These criteria were applied to control for prior parenting experience and parenting-relationship crisis.

Mothers were informed that the general purpose of the study was to better understand maternal and child adjustment during the transition to adolescence and that they would be asked questions about child development, maternal and child well-being, parenting, and family relations; eating and body issues were not listed as specific areas of inquiry.

Procedure

Once annually, mothers and their children visited a university research laboratory for approximately 2 hours to complete questionnaire packets. Each mother read and signed an informed consent form, while in a separate room her child was read aloud an assent form. The assent form conveyed to the child that her mother had given permission for the child to participate, but that it was the child’s choice to skip any items during participation, discontinue participation once begun, or not participate at all. The form also notified the child that her name would not be on her packet, that only the researchers and no one else, including her mother, would see her answers, and that her packet would be kept in a secured, locked location. Mothers and adolescents then separately completed questionnaire packets. Finally, as compensation, each dyad was paid $30 in the first year of the study, with an increase in this rate by $10 for each
subsequent year; by the fifth year of participation (when the adolescent was in 8th grade), each dyad received $70. The data of interest for the purposes of this study were the self-report responses of the 8th-grade adolescent girls.

Measures

*Heterosocial involvement.* A modified version of the Silverberg and Steinberg (1990) 7-item Heterosocial Scale was used to measure heterosocial involvement. Participants are asked how often they engage in various activities with male and female peers and respond to each item using a 7-point scale ranging from 1 (never) to 7 (once a day). An example item is, “About how often do you meet up with a group of boys and girls and do something or go somewhere together?” Responses to the items are summed to create a scale of heterosocial involvement with a possible range of 7 to 49, with higher scores indicating greater social involvement with mixed-sex groups. Evidence of this measure’s construct validity is given by its correlations with the Social Competence subscale of the Self Perception Profile for Children \(r = .39;\) Harter, 1985) and the Delinquency subscale of the Youth Self Report \(r = .40;\) Achenbach, 1991). Cronbach’s alpha in the present study was estimated at .90.

*Body dissatisfaction.* The 9-item Body Dissatisfaction subscale of the Eating Disorder Inventory ([EDI] Garner, Olmsted, & Polivy, 1983) was used to assess “the belief that specific parts of the body associated with shape change or increased ‘fatness’ are too large (e.g., hips, thighs, buttocks)” (p. 18). An example item is, “I think that my hips are too large.” Respondents indicated the frequency of their endorsement of each statement using a 6-point scale ranging from 0 (never) to 5 (always), with high scores indicating greater body dissatisfaction. Garner et al. originally recommended that item responses never, rarely, and sometimes receive a score of 0, and the responses often, usually, and always receive scores of 1, 2, and 3, respectively; however,
because this may reduce the available variation in responses, like others, we coded these responses respectively using a continuous 6–point scale (see Tylka & Subich, 2004). The criterion-related validity of the Body Dissatisfaction subscale has been demonstrated by its predicted relation to clinicians’ assessments of the relevance of body dissatisfaction characteristics for individual patients ($r = .44$; Garner et al.). Evidence of the concurrent validity of the subscale among older adolescents derives from its strong correlations in the expected direction with the Drive for Thinness subscale of the EDI ($rs = .63–.67$; see Espelage et al., 2003; Shroff & Thompson, 2006) and moderate correlations with the Bulimia subscale of the EDI ($r = .39$), the Appearance Conversations with Friends measure (Jones, Vigfusdottir, & Lee, 2004), which assesses how often adolescents discuss body expectations and appearance enhancements with their friends, ($r = .32$), and the Physical Appearance Comparison Scale (Thompson, Heinberg, & Tantleff, 1991), which assesses the tendency to compare one’s appearance with others’ ($r = .48$; for all, see Shroff & Thompson, 2006). Finally, the Body Dissatisfaction subscale has demonstrated evidence of its internal consistency with 11–to 18–year-old adolescent girls ($[\alpha = .91]$ Shore & Porter, 1990). In the present study, Cronbach’s alpha was estimated at .94.

*Perceived pressure to be thin.* An 8-item measure of the pressure one feels from one’s peers to be thin was developed for this study. Items for the Pressure to Be Thin Scale were generated in response to the lack of measurement of this construct as revealed by an examination of the literature. In creating the scale, several items were drawn directly from the McKnight Risk Factor Survey which assesses potential risk and protective factors for disordered eating in preadolescent and adolescent girls (Shisslak et al., 1999), and others were generated by the researchers. In all cases, the focus was on including items assessing the interpersonal pressure to
be thin that one perceives from peers. Example items are “How frequently has it been important that you look good for boys?” and “How frequently has it been important to your friends that you be thin?” Participants indicate their response to each item using a 6-point scale ranging from 0 (never) to 5 (always). Higher scores indicate greater perceived pressure from others to be thin.

Assessments of the scale’s validity and reliability were made via administrations of the scale and other measures to a separate sample over three years. Construct validity evidence is provided in part by its relation to responses on the Drive for Thinness subscale of the EDI (r = .77) (which assesses a preoccupation with dieting and weight, but not interpersonal influences on body concerns [e.g., “If I gain a pound, I worry that I will keep gaining.” and “I think about dieting.”]). Additional construct validity evidence is provided by its relation to the Appearance Competence subscale of the Self-Perception Profile for Children (r = −.61; Harter, 1985) and the Child Depression Inventory ([CDI] Kovacs, 1985; r = .53). Test-retest reliability from 6th to 8th grade was moderately strong (r = .63) and somewhat stronger over a shorter interval, from 7th to 8th grade (r = .77). Cronbach’s alpha in the present study was estimated at .85.

*Dieting behaviors.* A seven-item measure of dieting behaviors, the Dieting Behaviors Scale, was used to assess caloric restriction and elimination behaviors used by young adolescents (Blodgett Salafia, Gondoli, Corning, McEnergy, & Grundy, 2007). Dieting behaviors were defined as overt, socially acceptable, everyday means of restricting and eliminating caloric intake. The items of this scale were developed specifically to tap children’s and adolescents’ dieting behaviors, recognizing that children and adolescents do not have the same access to caloric restriction and elimination options as do adults. Items ask about behaviors that are possible for children to engage in, including, for example, the use of diet foods and drinks, restriction of or abstention from meals, and the use of exercise for the purpose of losing weight.
Participants indicate their responses to such items as, “How often have you skipped meals to lose weight?” and “How often have you exercised more to lose weight?” using a six-point scale ranging from 0 (never) to 5 (always).

Evidence of the Dieting Behaviors Scale’s construct validity is indicated by significant relations in the expected directions with the Bulimia subscale of the EDI ($r = .40$; Garner et al., 1983) and the Appearance Competence subscale of the Self Perception Profile for Children ($r = -.54$; Harter, 1985) (Blodgett Salafia, et al.). Test-retest reliability over one year (from 7th to 8th grade) was relatively high ($r = .88$) (Blodgett Salafia et al.). Cronbach’s alpha in the present study was estimated at .92.

*Body mass index (BMI).* BMI (weight [kg] / height [m$^2$]) scores were generated based on height and weight measurements. Girls’ height (to the nearest .5 cm) and weight (to the nearest .1 kg) were measured by a trained staff member. Higher scores indicate a greater proportion of body fat.

**Results**

*Descriptive Statistics*

Intercorrelations and descriptive statistics for the measured variables were calculated and are reported in Table 1. In order to test our hypothesized mediation model, it was first necessary to establish significant bivariate relations among the independent, dependent, and mediator variables (Baron & Kenny, 1986). As depicted, correlations between the variables were significant and in the expected directions, thereby lending preliminary support for our proposed model.

*Model Testing Procedures*
Model testing included examination of direct effects, full, and mediation models in sequence. The Mplus 4.0 program (Muthén & Muthén, 2006) was used to estimate relations among study variables for all of our models. The significance of the standardized path coefficients was determined by comparing each $t$ ratio with a critical $t(.05)$ of 1.96 or $t(.10)$ of 1.65. Additionally, we used the Mplus 4.0 program to derive model fit for our hypothesized mediation model. Model fit was assessed the chi-square statistic, the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). These fit indices have been suggested as a good combination for assessing the fit of models with relatively small sample sizes (Fan, Thompson, & Wang, 1999; Hu & Bentler, 1999; Yadama & Pandey, 1995). Models that provide a good fit to the data have nonsignificant ($p > .05$) chi-square values, CFIs greater than .95, RMSEAs less than .06, and SRMRs less than .08 (Hu & Bentler, 1999).

Model testing began with the examination of a direct effects model of the relation between the independent variable (heterosocial involvement) and the dependent variable (dieting behaviors) (see Figure 1). Results indicated that the path between heterosocial involvement and dieting behaviors was significant ($\gamma = .32$). This suggested that there was a positive, direct effect between heterosocial involvement and dieting behaviors, such that higher levels of heterosocial involvement were associated with higher levels of dieting behaviors.

Because the direct relation was significant, a full model was then tested that included the direct path between the two variables as well as the indirect paths to and from the mediator variables (perceived pressure to be thin and body dissatisfaction) (see Figure 2). Results indicated that the direct relation between heterosocial involvement and dieting behaviors was reduced to a value that was no longer significant ($\gamma = .081$) when perceived pressure to be thin
and body dissatisfaction were added to the model. All other path coefficients were significant and in the expected directions.

Next, a complete mediation model was examined in which the direct path between the independent and dependent variables was removed (see Figure 3). Model fit was good ($\chi^2$(1, $N = 90) = 1.52, $p = .22$, CFI = .997, RMSEA = .076, SRMR = .026), and all path coefficients were significant and in the expected directions. This suggests that higher levels of heterosocial involvement were associated with increased pressure to be thin and body dissatisfaction which, in turn, were associated with higher levels of dieting behaviors. Collectively, these results indicated that the direct path was not significantly different from zero and that mediation had in fact occurred, such that the relation between heterosocial involvement and dieting behaviors was accounted for by perceived pressure to be thin and body dissatisfaction.

Finally, separate models that controlled for the effects of adolescents’ BMI on the relations between the variables were examined. We began by testing the direct effects model while controlling for BMI. Results indicated that there was in fact a significant relation between BMI and dieting behaviors ($\gamma = .45$). However, the relation between heterosocial involvement and dieting behaviors remained strong and significant, suggesting that heterosocial involvement still predicted dieting behaviors ($\gamma = .29$) even when controlling for BMI. This lends support to our findings suggesting that heterosocial involvement is a particularly important predictor of adolescents’ dieting behaviors. Due to these findings, we did not examine full and mediation models while controlling for BMI.

Discussion

In the present study, we examined the influence of heterosocial involvement on dieting behaviors using a mediational approach in which pressure to be thin and body dissatisfaction
were investigated as mediators of this link. Results indicated that higher levels of heterosocial involvement in 8th grade were positively related to both pressure to be thin and body dissatisfaction, which in turn were positively associated with dieting behaviors. Furthermore, results of structural equation modeling revealed that the heterosocial involvement–dieting link was fully mediated by pressure to be thin and body dissatisfaction.

First, heterosocial involvement was associated with both pressure to be thin and body dissatisfaction. When girls are socializing in mixed-sex groups, they may feel pressure from both girls and boys to be thin. For example, girls may feel pressure to be thin in order to be liked. As our results show, the path coefficient between heterosocial involvement and pressure to be thin was quite strong. At the same time, our model proposes that heterosocial involvement also leads to increased body dissatisfaction. While interacting with their peers, girls may believe that they are not “thin enough” and become unhappy with their bodies. Yet, the path coefficient between heterosocial involvement and body dissatisfaction is not as strong as the former. While the model as a whole fits well, it seems that heterosocial involvement is more strongly correlated with pressure to be thin than it is with body dissatisfaction. This discrepancy can be explained by the nature of heterosocial involvement. For example, it is likely the case mixed-sex activities directly lead to a perceived pressure to be thin; however, such activities may not lead directly to body dissatisfaction (see, Gralen et al., 1990; Paxton et al., 2005). There does not appear to be anything inherent in hanging out in groups with other boys and girls that would lead to body dissatisfaction. While these two constructs (i.e., heterosocial involvement and body dissatisfaction) are certainly related, it would not be surprising to find that there is a mediating factor between them. Future studies should investigate potential mediators of this connection.
Second, links between pressure to be thin and dieting and body dissatisfaction and dieting were examined. A correlation between pressure to be thin and dieting in adolescents has been shown numerous times (Stice, Shaw, & Nemeroff, 1998; Striegel-Moore, Schreiber, Pike, Wilfley, & Rodin, 1995; Thelen & Cormier, 1995). Body dissatisfaction is also thought to increase dieting. In fact, both cross-sectional (Gleaves, Williamson, & Barker, 1993; Polivy, Herman, & McFarlane, 1994) and longitudinal studies (Patton, Johnson-Sabine, Wood, Mann, & Wakeling, 1990) have found a correlation between body dissatisfaction and dieting. Further, an experimental reduction in body dissatisfaction resulted in decreased dieting behaviors (Rosen, Cado, Silberg, Srebnik, & Wendt, 1990). Our results supported findings in the literature, as moderate to strong relations were found between these variables.

Despite these associations, it is important to note that bivariate correlations between several of our measures were strong. Dieting behaviors, our outcome variable, was strongly correlated with both pressure to be thin and body dissatisfaction. While these correlations are high, much research has been done to show that these constructs are, in fact, measuring different attitudes and behaviors. For instance, body dissatisfaction has been shown to increase the risk for subsequent onset of eating pathology among adolescent girls (Attie & Brooks-Gunn, 1989; Killen et al., 1996). Pressure to be thin has also been shown to foster body dissatisfaction because repeated messages that one is not thin enough often produce discontent with physical appearance (Striegel-Moore, Silberstein, & Rodin, 1986; Thompson et al., 1999). It may be that, in our model, pressure to be thin is a mediator of the heterosocial involvement-dieting link, as well as a predictor of body dissatisfaction. This would help explain the weaker relation between heterosocial involvement and body dissatisfaction.

Limitations and Future Directions
Some limitations of our data require consideration. First, the sample was almost homogenous with regard to its European American constitution. Therefore, to the extent that this model has not been tested with members of other ethnic groups, caution should be taken when considering generalization of these findings beyond European Americans. Interpretations of mixed-sex activities, in particular, may vary within different ethnic and cultural groups. Although the research is limited, some studies have suggested that the association between platonic and romantic involvement with boys and body dissatisfaction may vary by ethnicity. For instance, Halpern, Udry, Campbell, and Suchindran (1999) conducted a 2-year longitudinal study of African American and European American adolescent girls and found that they differed on measures of body image satisfaction and the importance of having a boyfriend. Specifically, European American girls were more likely to report that having a boyfriend was important and to indicate lower body image satisfaction than were African American girls.

Second, it is not entirely clear whether dieting or disordered eating precedes, accompanies, or follows girls’ involvement in mixed-sex activities. The correlational nature of this study does not allow us to determine precise causality. Yet based on the clinical literature, it seems likely that heterosocial involvement increases dieting, rather than the reverse. Other studies that have looked at this specific link (i.e., Cauffman & Steinberg, 1996; Compian, Gowen, & Hayward, 2004) have indeed shown that heterosocial involvement increases dieting. The authors are not aware of any study, to date, which has found the reverse association.

Third, although the self-report measures of the variables used in the present study (i.e., heterosocial involvement, pressure to be thin, body dissatisfaction, and dieting behaviors) generally are accepted as valid and reliable, they nonetheless are based on participants’ own interpretations. In some cases, the observations of others (e.g., peers, parents, clinicians, and
researchers) may be informative. For example, Cauffman and Steinberg (1996) encourage researchers to conduct longitudinal, multimethod studies that include repeated and detailed measures of girls’ heterosocial involvement from multiple different sources.

Finally, the consensus among eating disorder researchers is that risk for the development of eating disorders is multifaceted (see, e.g., Polivy & Herman, 2002; Striegel-Moore & Cachelin, 2001), including at least familial, biological, social, and psychological factors. Any single study, therefore, is unlikely to simultaneously and comprehensively assess the influence of the numerous factors that have been theorized to put individuals at risk, and the present study was similarly limited in its scope. The present study tested the validity of only one of many potential eating disorder risk paths. Future studies should use longitudinal approaches whenever possible and also test other possible pathways of risk, including variables such as internalization of the thin ideal (Stice, 2002; Stice & Bearman, 2001; Tylka & Subich, 2004), ruminative coping (Nolen-Hoeksema & Girgus, 1994; Polivy & Herman, 2002), peer support (Bearman, Presnell, Martinez, & Stice, 2006; Polivy & Herman, 2002), and substance use (Stice, Burton, & Shaw, 2004).

Again, it is important to acknowledge that we focused on one particular mediation model; other plausible and alternative models involving these constructs, as well as others, could be investigated. For instance, in a study of middle school girls, Levine and colleagues (1994) found that girls’ self-reports of their exposure to peer dieting techniques and their mothers’ own investment in slenderness were both significant and independent correlates of nonpathological dieting. These researchers, therefore, suggest that not only do maternal and peer concerns with weight and shape serve as important modeling cues for an adolescent girl’s weight management efforts, but also that girls who are committed to weight management are more attuned to this sort
of behavior in peers. Thus, in the present study, girls who were already concerned with their shape and weight may have actually sought out more mixed-sex activity and opinions about their bodies. It also remains unclear whether girls with higher scores of disordered eating actually receive more pressure from their peers to be thin (Pike & Rodin, 1991) or, because of a cognitive schema, simply perceive more pressure (Cooper & Fairburn, 1993). The purpose of the present study, however, was to test one particular theoretically and empirically motivated model that ultimately fit our data well; future studies could look to further investigate the nature of the pressure to be thin variable.

Practical Implications

With regard to practical implications, the results of this study suggest that, first, more attention should be directed to peers and their effects on the developing adolescent as potentially important targets in the prevention of maladaptive eating patterns. Second, interventions with young adolescents should include handling sociocultural pressures and maintaining a positive body image. Girls may benefit from education on peer influences from both girls and boys. In particular, they could learn about the potential deleterious effects of modeling friends’ poor dietary habits. Additionally, it is important for girls to understand that boys do not want them to be nearly as thin as they imagine (Paxton et al., 2005). Making girls aware of healthy body sizes and shapes, as well as how to handle mixed messages from peers, will ensure that the effects of heterosocial involvement are mitigated. Adolescent girls will likely always be involved in activities with members of both sexes; therefore, researchers and clinicians should be attuned to promoting healthy interactions and interpretations of those actions. It remains essential for adolescents to learn about the implications of harmful peer communication and how to prevent potential negative side effects from occurring.
To our knowledge, this study is the first to empirically evaluate the theorized mediational model positioning heterosocial involvement as predictive of pressure to be thin and body dissatisfaction, and, in turn, those factors as predictive of dieting behaviors. The empirical support, found here, of this etiologic chain contributes to the literature by providing both researchers and clinicians with a specific model for intervening against the possible development of eating disorders in adolescent girls. In particular, the impact that peer involvement has on adolescent girls is an important predictor of maladaptive eating behaviors. Understanding the attitudes and behaviors which may lead to dieting in adolescent girls will be vital in the continuing effort to decrease the prevalence of eating disorders within this population.
References


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