Sizing up Peers: Adolescent Girls' Weight Control and Social Comparison in the School Context

Anna S. Mueller[1], Jennifer Pearson[2], Chandra Muller[1], Kenneth Frank[3], and Alyn Turner[4]

Abstract

Using the National Longitudinal Study of Adolescent Health and multi-level modeling, we examine the role of social comparison with schoolmates in adolescent girls' weight control. Specifically, we focus on how girls' own weight control is influenced by the body sizes and weight-control behaviors of their schoolmates. Our findings suggest that comparisons with similar others (in this case, girls of a similar body size) appear to have the strongest association with individual girls' reports of trying to lose weight. For example, the odds that an overweight girl is engaged in weight control increase substantially when many overweight girls in her school are also trying to lose weight. This study highlights how schools play an important role in shaping girls' decisions to practice weight control and demonstrates how social comparison theory improves our understanding of how health behaviors are linked to social contexts.

Keywords

weight control, adolescence, school context, social comparison, obesity

For adolescent girls, body weight can be a complicated and sometimes difficult issue. In the U.S. culture that emphasizes and even at times rewards anti-fat attitudes (Puhl and Heuer 2009), girls often experience pressure to conform to normative ideals that equate being thin with being beautiful (Littleton and Ollendick 2003). As a result, an alarming number of girls report feeling dissatisfied with their bodies and engage in unnecessary or unhealthy weight-loss behaviors (see Littleton and Ollendick 2003 for a review). While exercise and a nutritious diet are a part of a healthy lifestyle, particularly given the prevalence of adolescent obesity (Ogden et al. 2002), when girls' weight control is accompanied by intense feelings of self-dissatisfaction, it can have harmful consequences for girls' physical and emotional health, such as eating disorders, anxiety, or emotional distress (Ge et al. 2001;

Lieberman et al. 2001; Littleton and Ollendick 2003; Stice and Whitenton 2002).

Though the majority of adolescent girls reports being aware of normative body ideals that equate beauty with thinness (Milkie 1999; Nichter 2000), how much girls embrace or reject these ideals as their own can vary dramatically, largely in reaction to their social experiences with weight-control and body ideals in the local, immediate contexts of their

[1]The University of Texas at Austin
[2]Wichita State University
[3]Michigan State University
[4]University of Wisconsin–Madison

Corresponding Author:
Anna S. Mueller, Population Research Center, The University of Texas at Austin, 1 University Station G1800, Austin, TX 78712
E-mail: AMueller@prc.utexas.edu

daily lives (Christakis and Fowler 2007; Eisenberg et al. 2005; Milkie 1999; Nichter 2000; Paxton et al. 1999; Pinhey, Rubinstein, and Colfax 1997). The role of the school as one such local context has remained largely unexplored in existing literature, which is striking because schools serve as the primary context of adolescents' social and academic lives. Because schools draw together developmentally-similar adolescents for long periods of time, they provide a social context that is ripe for observation, judgment, and social comparison. The foods girls eat, the size of their bodies, the weight values and behaviors they verbally or visibly endorse, and their appearance can be observed and used to judge whether they fit in (Eder, Evans, and Parker 1995; Jones 2001; Milkie 1999; Nichter 2000). Because physical appearance can play a powerful role in how girls experience social life in schools (Eder et al. 1995; Jones 2001; Milkie 1999; Nichter 2000; Paxton et al. 1999; Puhl and Heuer 2009), understanding how schools serve as a venue for the formation of girls' weight-related cultures is crucial to promoting healthy behaviors.

With this study, we examine the role of schools in adolescent girls' reports of trying to lose weight (regardless of whether they need to for medical reasons). Using the National Longitudinal Study of Adolescent Health (Add Health) and multi-level modeling, we explore the social comparison pathways that connect girls' individual reports of trying to lose weight to the characteristics and behaviors of their schoolmates. Specifically, we investigate who within the school would serve as a salient target for social comparison: all girls in the school (general others), girls of similar body size (similar others), or underweight girls (who come closest to conforming to predominant cultural norms that equate beauty with thinness [Crosnoe, Frank, and Mueller 2008]). To do this, we turn to social comparison theory and the prior research on how school contexts affect health behaviors and how girls use social comparison to evaluate their bodies.

WHY MAY SCHOOLS MATTER?

School Contexts and Health Behaviors

There is good reason to investigate the role of schools in encouraging girls' weight-control behaviors. Schools, as bounded social institutions that bring together students for long periods of time, are an important venue for the formation of adolescent peer cultures with specific values and

codes of behavior (Coleman 1961). These school cultures can become influential to individual student behaviors, particularly when conformity helps adolescents gain social status among their peers. This influence has previously been shown to extend to a wide range of health-related behaviors, including smoking, drinking, and sexual behaviors (Bearman and Brückner 2001; Crosnoe, Muller, and Frank 2004; Eisenberg and Forster 2003; Ellickson et al. 2003; Alexander et al. 2001; Kumar et al. 2002).

In terms of adolescents smoking, research has found that when adolescents attend schools where they perceive a high prevalence of smoking, individual students are much more likely to smoke themselves, even after controlling for the smoking behavior in their smaller peer groups (Ellickson et al. 2003). Further, the more an adolescent is exposed to smoking behavior and feels smoking is condoned or encouraged, the more likely he or she is to conform (Alexander et al. 2001; Kumar et al. 2002). In terms of drinking, when adolescents who drink attend schools with high levels of drinking in the student body, the risks of drinking are exacerbated (Crosnoe et al. 2004). Similarly, students who do not report drinking at all but are in schools with high levels of drinking suffer emotional and academic consequences (Crosnoe et al. 2004). Bearman and Brückner (2001) found a similar pattern in their study of adolescent sexual behavior in that the match between the student and the predominant behavior of the school was a key determinant of the adolescent's sexual decision-making. Their study of virginity pledges (where adolescents promise to abstain from sex) demonstrated that these pledges prevent adolescents from having sex only in contexts where there are some but not too many other pledgers (Bearman and Brückner 2001).

What these studies highlight is that the school context can be a powerful factor shaping adolescent health behavior through a variety of social-psychological mechanisms. Exposure to normative behaviors may render adolescents more likely to engage in that behavior themselves (Eisenberg et al. 2005; Ellickson et al. 2003). These studies also demonstrate the importance of fitting in or standing out, as the mismatch between students and their environment can condition how exposure to certain behaviors or values affects adolescents (Bearman and Brückner 2001; Crosnoe et al. 2004). This research suggests that focusing on how students fit into their schools in terms of their weight may provide important information on how

weight control, overweight, and unhealthy weight habits develop in adolescence. Because social comparison can provide needed information on fitting in, it may be a useful theoretical tool for understanding how girls' weight control is linked to their school contexts.

Friends vs. Peers in the School

A second reason to focus on schools as a source of social norms that influence girls' weight-control behaviors is that, though friends can encourage adolescents to engage in negative behaviors, such as unhealthy weight-control behaviors, friends can also provide an "arena of comfort" for adolescents to develop intimacies, experience social acceptance, and receive comfort and support (Giordano 2003). Much of the past work on body image and weight control has focused on the role of friends (Jones 2001; McCabe and Ricciardelli 2001; Paxton et al. 1999), but adolescents often select friends with similar traits so that friends become a support system that perpetuates existing adolescent attitudes and behaviors (Giordano 2003). Peers who are not friends, on the other hand, may represent a potentially more challenging audience for adolescents because the larger arena of same-age peers is not necessarily characterized by intimacy, frequently involves a status hierarchy (such as popularity), and often provides information (sometimes unsolicited information in the form of teasing) on how adolescents "measure up" to peers or ideals (Giordano 2003; Frank et al. 2008; Nichter 2000). The values of peers who are not yet friends may represent a harsher context of judgment, which may render fitting in or measuring up within the school more influential to girls' decisions to lose weight than their experiences in the more intimate, potentially more supportive context of friends. Peers in the wider network may serve as a more salient target for social comparison, as girls struggle to avoid the negative social and emotional consequences that can come with standing out, or as they try to reap the rewards of fitting in during the high school years.

SOCIAL COMPARISON THEORY

Prior research has established that social comparisons contribute significantly to body dissatisfaction among adolescent girls and that girls engage in comparisons with diverse targets (Jones 2001). Social comparison refers to the process that occurs as an individual observes those around her, identifies comparison others within that social context, and decides how she measures up (Festinger 1954). Social comparison generally leads individuals to feel pressured to conform to those with whom they compare themselves (Festinger 1954).

In terms of body image and weight control, there is strong evidence both that social comparison is relevant to girls' weight control and that social comparisons create a drive for conformity between girls and their comparison targets. Prior research has found that girls gather information on peer values, ideals, and behaviors that they then use to judge their bodies and decide on weight-control behaviors (Jones 2001; Jones and Crawford 2006; Jones et al. 2004; Paxton et al. 1999; Ricciardelli and McCabe 2003). Because many girls report feeling judged frequently on their physical appearance, the pressure to conform to the appearance culture of their peer contexts can feel significant (Eder et al. 1995; Jones 2001; Milkie 1999; Nichter 2000; Paxton et al. 1999).

In general, social comparison theory suggests that girls will conform to the behaviors, or in the case of body weight, the appearances, of the comparison others they deem relevant (Suls and Wills 1991). When applying the process of social comparison to the influence of school context on girls' body image and weight control, previous research leaves two interesting questions unanswered: first, how important are local school contexts; and second, how do adolescents choose targets for social comparison within the school context? Does exposure to all females in the context matter? Or are some girls more likely targets than others? To develop more concrete hypotheses with regard to these questions, we turn to specific tenets of social comparison theory.

Exposure to General Others

Sharing a school often means sharing a culture and an identity for the students in that school (Akerlof and Kranton 2002; Coleman 1961). Given that sharing a social space indicates exposure to others and their behaviors, values, and ideals, adolescents may experience pressure to conform to all schoolmates (particularly all girls; the different weight ideals for boys renders boys inappropriate targets [Jones 2001]). This process of social comparison to all other girls does not require that adolescents discriminate among peers within the school. It needs no recognition of a hierarchy among peers,

and it involves no identification of similar others *within* the school context. Exposure to schoolmates may invoke some degree of similarity and proximity: Students share the same school, providing them a shared identity and providing some degree of proximity as they share a social space on a daily basis. However, sharing a school may not be sufficiently proximate, and the shared trait of "schoolmates" may not be a trait that is relevant to rendering a student "similar" for social comparisons in terms of body weight (Suls and Wills 1991).

Thus, we anticipate that only some schoolmates are likely to provide a pathway for evaluating similarity or the role of proximity. This pathway represents the most general social comparison process—to all general others in the shared space of the school. It helps us answer the question, do school contexts matter? Thus, to investigate the role of exposure in the school context, we hypothesize that adolescents' reported behavior will conform to the behaviors and characteristics of all girls in the school.

Similarity

Though adolescents attend the same school, they may not necessarily identify with each other as similar others, particularly when trying to evaluate a specific trait such as body weight. Festinger (1954) emphasized individuals as being motivated to engage in accurate self-assessments to better themselves. Choosing similar others, argued Festinger, enables a more accurate self-evaluation than choosing dissimilar others (Festinger 1954). Later work has confirmed that similarity is a strong driving force between subjects and their targets of comparison (Wheeler et al. 1969), at least when subjects are extremely familiar with the attribute under evaluation, as is likely the case with girls and body ideals. The centrality of weight to how girls feel about their bodies (Jones 2001) suggests that it is likely that it is a significant visible marker of similarity within the school context. Instead, adolescent girls may determine similar others by identifying girls who are similar to them in terms of the trait they are aiming to evaluate—in this case, body weight (Wood and Taylor 1991). Thus, girls' weight control may be only responsive to the characteristics of others of a similar weight status.

To evaluate the role of similarity in students' choices of comparison targets, we hypothesize that girls' reported weight-control conforms to the behaviors and characteristics of their same-weight female schoolmates.

Status

Though similar others are potentially important targets for social comparison, individuals can have more diverse motivations for choosing targets for social comparison (Festinger 1954; Jones 2001; Suls and Wills 1991). Past research has shown that girls use social comparison to determine what is culturally valued and socially rewarded within their school (Jones 2001). Research also indicates that body weight and appearance do indeed contribute to social status in adolescence (Crosnoe et al. 2008; Eder et al. 1995; Jones 2001; Milkie 1999; Nichter 2000; Paxton et al. 1999). Specifically, using Add Health, Crosnoe et al. (2008) found that as body mass index (BMI) increases, the likelihood of others nominating an individual as a friend decreases. This pattern was found to be a function of the stigmatization of larger body size, particularly for adolescent girls (Crosnoe et al. 2008). Because widespread cultural norms in the United States equate ideal femininity with being thin, girls who conform to this ideal may receive a culturally-derived privileged status. This culturally-derived status of being thin can translate into social status for adolescent girls.

Thus, it is worth exploring whether girls whose weight status is closest to the normative "thin ideal" are more influential targets for social comparison; therefore, we operationalize girls with high status as girls who are underweight or thin (i.e., girls below the 25th percentile, which does not meet the CDC's definition of medically underweight, but identifies girls who have a significantly below-average BMI or thin body). Though this is only one way to measure "status" in adolescence, body weight is a highly visible trait and thus is useful to our examination of social comparison theory.

Thus, if status guides adolescents' choices of comparison targets, we hypothesize that all girls' weight control, regardless of their own BMI, will conform to the behaviors and characteristics of girls who possess normatively-valued physical traits (in this case, being underweight or thin).

Summary

In summary, to investigate the role of schools as a location for social comparison, we examine three types of potential social comparison processes: (1) comparisons to general others; (2) comparisons to similar others, defined by girls of similar weight statuses; and (3) comparisons to high-status others, operationalized by underweight girls who may

embody culturally-derived normative U.S. weight ideals. In addition, we explore both the weight status of schoolmates and the weight-control behavior of schoolmates, to see if the social comparison processes differ for the highly visible, observable characteristic of weight status versus less visible (though still potentially observable) weight-control behavior. To explore these hypotheses, we use longitudinal data and a nationally-representative sample of girls in 77 public and private U.S. high schools.

METHODS

Data

This study employs data from the National Longitudinal Study of Adolescent Health (Add Health). Add Health contains a nationally-representative sample of U.S. adolescents in grades 7–12 in 132 middle and high schools in 80 different communities. From a list of all schools containing an eleventh grade in the United States, Add Health selected a nationally-representative sample of schools utilizing a school-based cluster sampling design, with the sample stratified by region, urbanicity, school type, ethnic composition, and size. Additionally, a feeder school (that contained a 7th grade and sent graduates to the Add Health high school) was chosen for each Add Health high school.

From these high schools, Add Health selected a nationally-representative sample of adolescents. The preliminary in-school survey collected data from all students in all Add Health high schools (N = 90,118 students) in 1994–1995; from this sample, a nationally-representative sub-sample was interviewed at wave 1 (N = 20,745) slightly after the in-school survey (in 1994–95); a second wave followed in 1996 and collected information from 14,738 of the participants from wave 1. In addition to providing a nationally-representative sample of both schools and adolescents, Add Health contains large within-school samples that allow us to gauge the adolescent cultures of the schools. Additional information about Add Health can be found in Bearman, Jones, and Udry (1997).

Sample Selection

We employ several selection filters to determine our final analytic sample. Because the complex sampling design of Add Health requires weights be used in analyses, our first selection filter eliminates students who are not assigned a valid sample weight. Additionally, because we conduct longitudinal analysis, we confine our analysis to adolescents who participated in both wave 1 and wave 2 in-home interviews (N = 13,568). This excludes most students who were seniors at wave 1 (as most seniors were no longer in school and were not followed up by Add Health at wave 2). We also limit our sample to high-school students so that we did not have students transitioning between schools (from middle to high school) between waves 1 and 2. This reduces our sample to 8,642. Previous research suggests that boys' body concerns differ from those of girls (Ricciardelli and McCabe 2003); therefore, we limit our sample to girls (reducing the sample to 4,389). Finally, approximately 378 girls are omitted due to missing information on key variables.

While these selection filters have the potential to bias our results, they allow us to explore critical aspects of BMI and weight control in schools. To gauge any potential bias, Table 1 presents the means for key variables from the original wave 1 female sample and our analytic sample. Overall, our analytic sample does not vary dramatically from the original wave 1 female sample. Further, the excluded respondents' demographic characteristics (not shown in the table) are extremely similar to both the analytic sample and the wave 1 female sample. The only significant demographic differences between the samples are that Asian Americans and Latinas were significantly less likely than white Americans to be excluded, though the difference in likelihood was quite small (these data are available from authors upon request).

Measures

Outcome: Trying to lose weight, wave 2. Our dependent variable is based on the responses to the question, "Are you trying to lose weight, gain weight, or stay the same weight?" Adolescents who answered "lose weight" were coded as 1 on this variable; all others are coded as zero. This variable may capture some form of compliance with "fat talk" norms—girls saying they are trying to lose weight without actually engaging in weight-control behaviors; however, the majority of these girls also report engaging in specific weight-control behaviors, such as dieting or exercising. Thus, this variable appears to identify girls who are likely to be practicing some form of weight control in order to lose weight.

Individual-level independent variables. Our primary individual-level independent variable is adolescent's body mass index (BMI) at wave 1. To

Table 1. Descriptive Statistics for Key Variables for Wave 1 Female Add Health Sample and Analytic Sample (Unweighted)

	M (SD)	
	Wave 1 female sample	Analytic sample
Individual-level Variables		
Trying to lose weight	.48	.47
Overweight (BMI above 85th percentile)	.23	.22
BMI above 75th but below 85th percentile	.13	.14
Underweight (BMI below 25th percentile)	.17	.15
Latina	.17	.18
African American	.23	.22
Asian American	.07	.08
Non-Latina white	.51	.50
Parents' education level	2.84 (1.28)	2.85 (1.28)
N (Individuals)	9,649	4,011
School-level Variables; Proportion of:		
Underweight girls	—	.18 (.06)
Overweight girls	—	.23 (.10)
Underweight girls trying to lose weight	—	.12 (.11)
Overweight girls trying to lose weight	—	.78 (.15)
All girls trying to lose weight	—	.48 (.08)
Average girls' BMI	—	22.54 (1.09)

Source: *National Longitudinal Study of Adolescent Health.*

calculate BMI, self-reported height and weight of adolescents were used in the following formula: (weight in pounds / height in inches^2) × 703. Using the weight × age × gender tables provided by the Center for Disease Control (2000) for adolescents, we identify overweight adolescent girls (those at or above the 85th percentile for BMI for their age group) and underweight adolescent girls (those at or below the 25th percentile for BMI). The threshold for overweight is set by the CDC (2000). We follow prior research (e.g., Jones and Crawford 2006) and identify underweight girls as those at or below the 25th percentile for their age (Jones and Crawford 2006). We also include a control for girls at or above the 75th percentile but below the 85th percentile of BMI. These girls are not overweight as defined by the CDC, but they are near the threshold and therefore may be a particularly interesting group with which to explore the effects of the school context. Girls between the 25th and 75th percentiles are used as the reference group.

Because individual factors can either place girls at risk or protect girls from developing body dissatisfaction or other weight-related issues, all models also control on other factors related to body weight or body concerns. This allows us to better isolate the roles of schools. Cognitive skills

may serve as a protective factor against body image problems (Littleton and Ollendick 2003), so we control for adolescents' self-reported grade point average (GPA) at wave 1. All models include the adolescent's age at wave 2, race and ethnicity, parents' highest education level, and pubertal status, age, and whether or not the adolescent was engaged in a romantic relationship. Because African American girls are less likely to feel pressure to lose weight, we control for race and ethnicity (Ge et al. 2001; Lovejoy 2001; Milkie 1999; Nichter 2000). Our measure of race and ethnicity is coded as a set of five dichotomous variables: Latina, African American, Asian American, and other, with white as the omitted reference category in regression analyses. Because social class may affect girls' desires to be thin, and thus their likelihood of being overweight (Dornbusch et al. 1984; Mirowsky and Ross 2003), we control for the girls' parents' education level. Parents' education is taken from Add Health's parent questionnaire, and the maximum value was taken in the case of two parents. If the information is missing from the parent questionnaire, the students' reports of their parents' education levels are used. Parents' education is coded as 0 for never went to school; 1 for less than high school graduation; 2 for high school

diploma or equivalent; 3 for some college, but did not graduate; 4 for graduated from a college or university; and 5 for professional training beyond a four-year college or university.

School-level variables. To create our school-level variables, individual scores are averaged at the school level to create a variable that represents the proportion of girls in the school engaged in a behavior or the average characteristic of girls (like BMI) in the school. Add Health's entire female wave 1 sample is used to construct this measure and all weight-related school-level variables. For all school-level variables, the average is weighted by the wave 1 sample weight to account for each individual's probability of being sampled. Using this procedure (aggregating the wave 1 student responses to the school level), we constructed the school-level variables: *report of trying to lose weight (wave 1)*, the *average BMI* of girls in the school, *proportion of underweight girls* in the school, *the proportion of underweight girls reporting trying to lose weight (wave 1), the proportion of overweight girls,* and *the proportion of overweight girls reporting trying to lose weight*.

To test our first hypothesis (the role of general others), we utilize the proportion of all girls in the school who report trying to lose weight and the average BMI of girls in the school. These are broad measures that characterize all girls in the school, regardless of their weight status as underweight or overweight, and thus they are not likely to capture girls' recognition of similar or high-status others (in terms of weight). To test our second hypothesis (the role of similar others), we use *proportion of underweight girls, proportion of underweight girls reporting trying to lose weight, proportion of overweight girls,* and *the proportion of overweight girls reporting trying to lose weight*. As we describe in more detail below (see analytic plan), we estimate cross-level interactions to see if the effect of same-weight status girls' characteristics are more salient than the characteristics of all girls in the school, which would suggest that similar others are in fact more likely targets for social comparison.

Finally, we use the same variables but a different modeling strategy to explore the role of status in social comparison. To test whether all girls reference high-status girls for social comparison, we estimate another cross-level interaction using the characteristics of underweight girls to see if their characteristics are particularly influential for overweight girls. We also look at the direct effect of the characteristics of underweight girls for all girls in

the school: is the *proportion of underweight girls* or the *proportion of underweight girls reporting trying to lose weight* particularly associated with the likelihood that any girl in the school is reporting trying to lose weight?

Analytic Plan

According to our conceptual model, we predict that trying to lose weight is influenced by the weight attributes and weight-loss attempts of the girls in an individual's school. To investigate our conceptual model, we estimate multi-level models predicting weight-loss behavior with individual and school-level variables.

As a first step, we estimate a two-level, unconditional model (Raudenbush and Bryk 2002) to explore whether there is significant variation between schools in *trying to lose weight* (*WL behavior*). The equation for the formal unconditional model for student i in school j is:

$$\text{Log} \left[p(\text{WL behavior}_{ij} = 1) / (1 - p(\text{WL behavior}_{ij} = 1)) \right] = \beta_{0j} \qquad (1)$$

where β_{0j} (the intercept) is modeled at the second level as:

$$\beta_{0j} = \gamma_{00} + u_{0j} \qquad (2)$$

and u_{0j} represents random error among schools (which is assumed to be normal with variance τ). The intercept (β_{0j}) has a subscript j which indicates that each school in our sample has a unique intercept. From this we estimate the amount of variation between schools on our dependent variable (*WL Behavior$_{ij}$*) (Raudenbush and Bryk 2002). We find significant variation ($\hat{\tau} = .057$, $p < .001$) between schools supporting our attempts to explain some of this variation with our school-level variables.

Next, we expand equation 1 to include individual-level variables (such as *BMI$_{ij}$*):

$$\text{Log} \left[p(\text{WL behavior}_{ij} = 1) / (1 - p(\text{WL behavior}_{ij} = 1)) \right] = \beta_{0j} + \beta_{1j} \text{BMI}_{ij} \qquad (3)$$

We can also expand equation 2 to include independent school-level variables that may explain a portion of the variance between schools. This allows us to model the unique effects of being in a particular school at level two, the school level (j):

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \text{ school weight-loss}$$
$$\text{behavior}_j + u_{0j} \qquad (4)$$

Thus, γ_{01} represents the effect of the proportion of girls in the school engaging in weight-loss behavior (*school weight-loss behavior*$_j$) on individual weight-loss behavior (*WL behavior*$_{ij}$). Theoretically, girls in schools with different values on the *school weight-loss behavior*$_j$ variable, on average, will experience different likelihoods of engaging in weight-loss behavior (*WL behavior*$_{ij}$) themselves. Recall that the school-level variable, *school weight-loss behavior*$_j$, is measured at wave 1 and the outcome, *WL behavior*$_{ij}$, is measured at wave 2; therefore, we are measuring the contextual effect of the school's culture one year prior to the measurement of the outcome (Raudenbush and Bryk 2002).

All models are estimated with the HLM6 software (Raudenbush et al. 2004). All individual-level variables are centered around the grand mean (individual values are converted into deviations from the overall sample mean). The intercepts in all models can thus be interpreted as the odds of engaging in weight-loss behavior for the hypothetical female who is average on all variables (Raudenbush and Bryk 2002). We include the wave 2 student-level weights normalized at the individual level. These weights compensate for Add Health's sampling design and for sample attrition, and they make the results more representative of the nation than in unweighted analyses. We report the Laplace estimates, as they provide more robust and accurate estimates for logistic regression models with HLM (Raudenbush, Yang, and Yosef 2000).

RESULTS

General Others: All Girls as Target for Social Comparison

Table 2 presents HLM models predicting trying to lose weight with the sample. Models 1 and 2 explore our first hypothesis that all girls serve as social comparison targets. Model 1 investigates the weight-loss behaviors of all girls in the school and reveals no significant association between the behavior of all girls in the school and an individual girl's likelihood of trying to lose weight. This suggests that the behavior of all girls is not relevant to individual girl's weight-loss behaviors. However, model 2 shows that girls in schools with a higher average female BMI are less likely to engage in weight-loss behavior. Model 3 tests whether the effects shown in models 1 and 2

change when the two level-two variables are included in the same model. Average female BMI remains largely unchanged and significantly associated with girls' attempts to lose weight after the proportion of girls trying to lose weight is included in the model. Though the proportion of girls in the school who are trying to lose weight remains insignificant (i.e., $p > .05$), the coefficient size increases by approximately 44 percent (while the standard errors of both coefficients remain stable, suggesting that there is not a problem with multicollinearity), and the coefficient approaches statistical significance ($p < .10$). Overall, this suggests that the physical characteristics of female schoolmates may be more important than their behaviors, but further investigation is warranted.

Models 4 and 5 further investigate the importance of general others and their physical characteristics (i.e., BMI) and behaviors. As with model 3, models 4 and 5 show that the behavior of general others does not have a significant association with the behavior of individual girls in the school; however, the physical characteristics—in model 4, the proportion of underweight girls, and in model 5, the proportion of overweight girls—are significantly and substantially associated with girls' individual likelihood of trying to lose weight. We find that, on average, the odds that an otherwise average girl reports trying to lose weight increase by 11.1 percent with a one standard deviation increase in the proportion of underweight girls in her school (net of all other school and individual variables; see model 4). Model 5 shows that, on average, the odds that a girl is trying to lose weight decrease by 10.4 percent with a one standard deviation increase in the proportion of overweight girls in her school. In summary, models 1–5 show mixed support for Hypothesis 1. The likelihood that girls are trying to lose weight appears to vary based on the physical characteristics of the average girl in her school, but not on the behaviors of the average girl in the school.

Similarity: Same-Weight Status Girls as Targets for Social Comparison

Model 6 and 7 in Table 2 test our second hypothesis, that if similarity guides choices of social comparison targets, adolescent girls' behaviors will conform to the behaviors and characteristics of similar-weight girls in the school. In Table 2, model 6, we find that the characteristics of underweight schoolmates are most influential for individual girls of a similar-weight status (other

Table 2. Unstandardized Laplace Coefficients from Multi-Level Models Predicting Trying to Lose Weight among Adolescent Girls: Evaluating the Role of Social Comparison to General, Similar, and High-status Others

| | General | | | | | | | | | | Similar | | | | High-status | |
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | | Model 8 | |
School-level	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
1 Proportion of all girls trying to lose weight	.88	.80	—	—	1.27	.74 +	—	—	—	—	—	—	—	—	—	—
2 Average girls' BMI	—	—	−.09	.04 *	−.12	.04 **	—	—	—	—	2.13	.76 **	—	—	1.72	.74 *
3 Proportion of underweight girls	—	—	—	—	—	—	1.75	.75 *	—	—	.43	.54	—	—	.23	.55
4 Proportion of underweight girls trying to lose weight	—	—	—	—	—	—	.24	.53	—	—	—	—	—	—	—	—
5 Proportion of overweight girls	—	—	—	—	—	—	—	—	−1.10	.51 *	—	—	−1.00	.52 +	—	—
6 Proportion of overweight girls trying to lose weight	—	—	—	—	—	—	—	—	.40	.30	—	—	.57	.29 +	—	—
Cross-level Interactions																
Underweight girl by:																
7 Proportion of underweight girls	—	—	—	—	—	—	—	—	—	—	5.22	2.49 *	—	—	—	—
8 Proportion of underweight girls trying to lose weight	—	—	—	—	—	—	—	—	—	—	2.61	1.30 *	—	—	—	—
Overweight girl by:																
9 Proportion of overweight girls	—	—	—	—	—	—	—	—	—	—	—	—	−.20	1.09	—	—
10 Proportion of overweight girls trying to lose weight	—	—	—	—	—	—	—	—	—	—	—	—	1.90	.80 *	—	—
11 Proportion of underweight girls	—	—	—	—	—	—	—	—	—	—	—	—	—	—	−1.01	1.92
12 Proportion of underweight girls trying to lose weight	—	—	—	—	—	—	—	—	—	—	—	—	—	—	−.05	.74
Individual-level																
13 BMI ≥ 85th percentile (overweight)	1.79	.10 ***	1.82	.10 ***	1.82	.11 ***	1.81	.10 ***	1.82	.10 ***	1.80	.10 ***	1.79	.11 ***	1.79	.10 ***
14 75th ≤ BMI < 85th	1.02	.11 ***	1.03	.11 ***	1.03	.12 ***	1.02	.11 ***	1.02	.11 ***	1.02	.12 ***	1.02	.11 ***	1.02	.12 ***
15 25th < BMI < 75th (ref.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16 BMI ≤ 25th (underweight)	−1.35	.14 ***	−1.35	.14 ***	−1.34	.15 ***	−1.36	.14 ***	−1.35	.15 ***	−1.57	.16 ***	−1.35	.15 ***	−1.37	.14 ***
17 Intercept	−.15	.05 **	−.14	.05 *	−.15	.05 **	−.14	.05 *	−.15	.05 *	−.17	.06 **	−.15	.06 *	−.14	.05 *
School-level variance	.07 ***		.09 ***		.06 ***		.06 ***		.08 ***		.06 ***		.08 ***		.06 ***	
N (Individuals)	4,011		4,011		4,011		4,011		4,011		4,011		4,011		4,011	
N (Schools)	77		77		77		77		77		77		77		77	

Note: Model also includes controls for race-ethnicity, parents' education, age, GPA, romantic relationships, and pubertal development. Bold coefficients denote results discussed in the text specific to the study's research aims.

+$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

underweight girls) (see the cross-level interaction in model 6, rows 7 and 8). We find that, on average, the odds that an otherwise average underweight girl is engaging in (unnecessary) attempts to lose weight increase by 55 percent with a one standard deviation increase in the proportion of underweight girls in her school (net of all other school and individual variables). The odds that the same girl is trying to lose weight also increase by 40 percent with a one standard deviation increase in the proportion of underweight female schoolmates engaged in weight-loss behaviors. Though on average underweight girls are less likely to be attempting weight loss (see model 6, row 16), the probability that they are attempting weight loss is strongly associated with the characteristics and behavior of similar others in their school.

To further pursue the investigation of the role of similar others in girls' weight-loss behaviors, we estimated model 7 in Table 2, which includes the proportion of overweight girls and the proportion of overweight girls trying to lose weight at the school level. Model 7 also includes a cross-level interaction (rows 9 and 10) to explore whether the characteristics of overweight girls are more salient for overweight girls. We found that the association between the proportion of overweight girls in the school and the likelihood that an individual girl is trying to lose weight does not vary between overweight and all other girls (model 7, row 9, the coefficient is insignificant). Rather, all girls, regardless of their BMI, are less likely to engage in weight-loss behaviors in schools with a higher proportion of overweight girls (see Table 2, row 5 in model 5). However, on average, overweight girls are significantly more likely than all other girls to engage in weight-loss when many overweight girls in their school are trying to lose weight (model 5, row 10). Though, on average, overweight girls are more likely than any other BMI group to be attempting to lose weight (see all models Table 2, row 13), the odds that they are engaged in weight-loss behaviors increase by 45 percent with a one standard deviation increase in the proportion of overweight girls trying to lose weight in the school (model 7). These findings lend further support to our hypothesis that similar others have a substantial influence on girls' weight-loss behaviors. It is also worth noting that similar others have a much more substantial and complex (not simply significant) association with individual girl's behaviors than the characteristics of general others.

Status: Underweight Girls as Targets for Social Comparison

Table 2, model 8 addresses our final hypothesis, that girls will be motivated to conform to the behaviors and characteristics of underweight girls because underweight is a culturally-rewarded weight status. This model analyzes whether the effect of the culturally-rewarded underweight BMI category is more influential than the culturally-discouraged overweight status. To test our third hypothesis, we estimated a cross-level interaction with overweight girls by the proportion of underweight girls and the proportion of underweight girls trying to lose weight in the school (see Table 2, model 8). If girls prefer to reference high-status others for comparisons (in this case, operationalized by underweight girls), then the proportion of underweight girls in the school should be important to overweight girls' behaviors, just as it was for underweight girls' behaviors in model 6. However, neither the proportion of underweight girls in the school nor the proportion of underweight girls trying to lose weight has any effect on the likelihood that overweight girls are engaged in weight-loss behavior (see the insignificant coefficients in model 8, rows 13 and 14).

Thus, overall, we do not find extensive support for our third hypothesis, that girls target girls with a high culturally-derived status for social comparison. Our only support for this hypothesis is that the proportion of thin girls in the school does seem to be very important (see models 4, 6, and 8, row 3), regardless of other school-level controls that are included. This evidence is comparatively weaker than the evidence we find in support of our second hypothesis—that girls compare to similar others.

DISCUSSION

The majority of adolescent girls report being aware of the gendered ideals that equate feminine beauty with being thin (Milkie 1999; Nichter 2000); however, how youth embrace or reject these ideals into their own weight-control decisions can vary dramatically based on their experiences with the weight-control behaviors and the physical characteristics of others in the local, immediate contexts of their daily lives (Christakis and Fowler 2007; Eisenberg et al. 2005; Nichter 2000; Paxton et al. 1999; Pinhey et al. 1997). With this study, we add to this growing literature, first, by analyzing how the school serves as an important context where girls

learn weight ideals, and second, by investigating the social comparison pathways that connect girls' individual behaviors to the characteristics and behaviors of their schoolmates. Specifically, we tested who within the school would serve as a salient target for social comparison, focusing on general others, similar others, and high-status others (where similar and high-status others were identified by their BMI status).

Our most important finding was that similar others are the most influential group within the school context for girls because both their physical BMI status and their behaviors matter to individual girls of a similar weight status. The weight-loss behavior of overweight girls is most associated with the prevalence of weight-loss behavior among overweight girls in the school. The same is true for underweight girls. The more underweight girls there are who are trying to lose weight, the more likely it is that an individual underweight girl in that school is trying to lose weight. We also find evidence that all girls in the school matter, in that girls (net of their own BMI) are less likely to try to lose weight in schools where there are many overweight girls or where the average female BMI is high, and more likely to try to lose weight in schools where there are many underweight girls; however, the behaviors of *similar* others have the most substantial association with individual behavior. Future research should examine whether this pattern is found when girls are similar in terms of other attributes. For example, prior literature shows that there is important variation in body image and body weight by race and ethnicity (Jones and Crawford 2006; Lovejoy 2001; Milkie 1999; Nichter 2000; Neumark-Sztainer et al. 1999; Robinson et al. 1996). Thus, it is possible that adolescents reference their peers of a similar race or ethnicity when deciding on weight-control behavior. It was beyond the scope of this article to include such an investigation here, but the analysis would no doubt be informative.

What these findings suggest is that comparisons with similar others (in this case, female schoolmates of a similar body size) appear to be the most powerful in terms of influencing behavior (in this case, individual girl's weight-loss behaviors). We did not find the behavior of high status adolescents to be associated with the behavior of any adolescents other than other high status adolescents. This suggests that engaging comparisons to girls with potentially "idealized" bodies (underweight) may not be how body ideals are communicated in high schools as a whole; however, future

research should investigate other forms of status, as a potential limitation to this finding is how we operationalized status using the physical trait of BMI (Crosnoe et al. 2008). For example, operationalizing status in terms of social ties or popularity within the school may provide more evidence about the role of status as a motivation for choosing targets for social comparison of body weights.

In addition to our main conclusions from our formal hypotheses, there are other aspects of our findings that are worth noting. For example, underweight girls' weight-loss behavior is the most strongly and significantly associated with various aspects of the school context. This may be because underweight girls are the group that is least likely to try to lose weight, unless they encounter contexts that emphasize being underweight and losing weight. Thus, the measures of school context may have more of an opportunity to be associated with underweight girls' weight control than overweight girls who, on average, are the most likely to be trying to lose weight, regardless of school context.

Additionally, BMI is significantly associated with individual girl's likelihood of trying to lose weight, whereas the less obvious prevalence of weight-loss behaviors is less uniformly associated with individual girl's behaviors. This suggests that visibility plays an important role in how norms and ideals are communicated in an indirect fashion in relationships characterized by a shared space (the school) but not necessarily direct interaction or intimate relationships.

While we provide findings from a nationally-representative and diverse sample of adolescent girls and schools, the measures of weight control that we are able to employ are more limited than the elaborate measures often used in more specialized surveys. Because we find strong evidence that school cultures affect girls' weight control, future research should examine how school cultures influence other aspects of girls' body images and weight-loss behaviors. In addition, our study has focused on girls' weight-related behaviors, but recent research suggests that adolescent boys are increasingly experiencing problems with body image and weight control (Littleton and Ollendick 2003; Ricciardelli and McCabe 2003). However, because standards of attractiveness for boys emphasize strength and muscular build, and to a lesser extent thinness (Jones 2004; Ricciardelli and McCabe 2003), our measures of weight loss behavior are ill-suited for a study of boys' experiences of body concerns in schools. This is an important and relatively unexplored area of study that deserves attention in future research.

This study provides important contributions to sociology, health research, and social-psychological theories. Specifically, our findings point to how important social comparison theory may be in terms of understanding other health behaviors, particularly when linking individuals to the larger contexts in which their lives unfold. Our study further suggests that future work should examine similar others, particularly in contexts that share the bounded social characteristics of schools, as motivators for other health behaviors or ideals. Important next steps will be to identify if and how these social comparison processes work for boys' weight-control behaviors, and if other aspects of similarity or status also guide the choices of references for social comparison. Essentially, this framework may provide a more nuanced way to understand health behavior in context.

CONCLUSION

Overall, our findings suggest that social contexts in schools play an important role in shaping girls' decisions to practice weight control. How widespread social ideals that equate attractiveness with thinness affect girls depends in part on the weight-related culture they experience in the primary social context of their daily lives—their schools. While the educational opportunities that schools provide are important, research and policy makers should not neglect the institutionalized role of schools as a social location where adolescents cultivate social relationships and form a sense of self.

Because weight can be such a difficult issue for girls, it is not surprising that girls appear to be extremely sensitive to the school as a source of norms regarding ideal weight, and that girls, especially similar girls, within the school serve as salient targets for social comparisons that have meaningful consequences for girls' weight control. The body size of schoolmates matters regardless of similarity, but it is only the weight control behaviors of *similar* others that matters to girls' attempts to lose weight. This suggests that weight loss is motivated not simply by normative standards of beauty, but by the embodied ideals and behaviors of those most similar to an individual. The normative ideal in the United States that equates beauty with being thin seems to become particularly salient to girls' own desire to lose weight, particularly when it is a value that is reinforced in the more local context of their daily lives (their school).

This has implications for how researchers and policy makers think about how individuals develop health behaviors. Local contexts and people that individuals have decided are relevant to their self-concept (i.e., as a target for social comparison), or as a member of a shared social space, are significant sources of potentially health-changing values and behaviors. For girls' body image, this suggests that it may be important when designing programs to address girls' body image issues in a way that helps girls curtail the desire to socially compare with other schoolmates. Encouraging girls to rely on their own skills to critique the thin ideal wherever they encounter it, and to develop their own healthy habits, is key to helping them cope in the often difficult developmental stage of adolescence. Several psychologists have designed such programs (see, for example, Reflections: Body Image Program[1] or The Body Project[2]) that are based on years of research and experience and have the advantage of having undergone scientific evaluation studies published in peer-reviewed journals (Becker et al. 2008; Becker, Smith, and Ciao 2006; Stice et al. 2008). Programs that instill in girls a sense of similarity with other group members and shared ideals that de-emphasize the normative thin ideal may be key to empowering girls to lead healthy lives.

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NOTES

1. Reflections: Body Image Program, which specifically focuses on disrupting fat talk, at http://www.bodyimage program.org/.

2. The Body Project: Promoting Body Acceptance and Preventing Eating Disorders http://www.ori.org/thebodyproject/.

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Bios

Anna S. Mueller is a doctoral candidate and an NSF graduate research fellow in the Department of Sociology at the University of Texas at Austin. She is also a graduate student trainee at the Population Research Center. Her research focuses on education, health, and gender using a social-psychological framework. Her current projects

include an investigation into the role of social contexts in schools on adolescent weight-change behavior and BMI, and an examination of gender equity in salary and work experiences among faculty and graduate students. Her substantive interests are also often linked to her methodological interest in multi-level modeling and social network analysis.

Jennifer Pearson is an assistant professor of sociology at Wichita State University. Her primary research interests are in the areas of gender, sexuality, and education. Her current work explores the role of school and family contexts in shaping the well-being of sexual minority youth.

Chandra Muller is Professor of Sociology and Faculty Research Associate at the Population Research Center at the University of Texas at Austin. Her research focuses on the role of schools and education in adolescents' transition to adulthood. Her current projects include a study of the effects of schools on immigrant students' voting behavior in early adulthood, as well as several studies about the academic factors that contribute to success in science and math, with an emphasis on gender, race, and ethnicity.

Kenneth Frank is currently a professor in counseling, educational psychology, and special education, as well as in fisheries and wildlife at Michigan State University. His substantive interests include the study of schools as organizations, social structures of students and teachers and school decision-making, and social capital. His substantive areas are linked to several methodological interests: social network analysis, causal inference, and multi-level models. His publications are on topics including quantitative methods for representing relations among actors in a social network, robustness indices for inferences, and the effects of social capital in schools and other social contexts.

Alyn Turner is a graduate student of sociology at the University of Wisconsin–Madison. Her interests focus on health and educational inequalities among children and adolescents. Her research examines how early child health inequalities affect processes of social stratification and the intergenerational transmission of status. She also investigates how to assess and maintain children's health from policy and theoretical perspectives.