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Weight Control, Self-Perception, and Self-Esteem in Adolescence: The Role of Schools and Social Comparison

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Weight Control, Self-Perception, and Self-Esteem in Adolescence: The Role of Schools and Social Comparison

by

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Dedication

To Julio

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Weight Control, Self-Perception, and Self-Esteem in Adolescence: The Role of Schools and Social Comparison

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Abstract: For adolescents, body weight can be a complicated and sometimes difficult issue. Though the majority of adolescents report being aware of normative gendered body ideals, how adolescents incorporate or reject these ideals into their own weight-control decisions or sense of self can vary dramatically, largely in reaction to their social experiences with body ideals in the local, immediate contexts of their daily lives. The role of one such local context - schools - has remained largely unexplored in existing literature. Using the National Longitudinal Study of Adolescent Health (Add Health) and multi-level modeling, I investigate the role high school weight cultures play in the development of adolescents' weight-loss behaviors, overweight self-perceptions, and self-esteem. I employ social comparison theories, specifically the idea of who may serve as a likely target for social comparison - general others, similar others, or high status others - to develop hypotheses about which aspects of the school context may be associated with various aspects of adolescents' body weight. Overall, my results indicate

that there is a strong relationship between adolescents' weight-loss behavior, self-perception and self-esteem and the weight-related culture in the school. For example, adolescent boys, on average, are significantly less likely to report perceiving themselves as overweight or engaging in weight-loss behaviors when they attend schools where there are many overweight boys in the student body. I also find that there is some variation within the school in terms of which peers are most salient to adolescents' behaviors and self-perceptions. Both boys and girls are particularly impacted by the values and behaviors of similar others, when similarity is defined by same-sex adolescents of a similar body size. For example, on average, overweight adolescent girls are significantly more likely to report engaging in weight-loss behaviors when a higher proportion of overweight girls in their school also are engaged in weight-loss behaviors. The same pattern is found among adolescent boys. Overall, these findings suggest that meso-level social contexts - like schools - may be particularly important to how individuals incorporate macro-level beliefs or values - like gendered body ideals - into their own behaviors and self-concepts.

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Chapter 1: Introduction

For adolescents, body weight can be a complicated and sometimes difficult issue. In the U.S., where anti-fat attitudes are emphasized and even rewarded, adolescents often experience pressure to conform to normative ideals that equate being thin and toned with ideal femininity and being muscular and athletic with ideal masculinity (Jones and Crawford 2006; Littleton and Ollendick 2003). As a result, an alarming number of adolescents report feeling dissatisfied with their bodies and engage in unnecessary or unhealthy weight-change behaviors (Lieberman, Gauvin, Bukowski, and White 2001). While exercise and a nutritious diet are a part of a healthy lifestyle, particularly given the increasing prevalence of adolescent obesity (Ogden, Flegal, Carroll, and Johnson 2006), when accompanied by feelings of intense dissatisfaction with oneself or when taken to an extreme, these behaviors can have harmful consequences for physical and emotional health, such as, the development of eating disorders, anxiety, or emotional distress (Ge, Elder, Regnerus, and Cox 2001; Lieberman et al. 2001; Littleton and Ollendick 2003; Stice and Whitenton 2002).

Though the majority of adolescents report being aware of normative body ideals (Milkie 1999; Nichter 2000), how adolescents incorporate or reject these ideals into their own weight-control decisions or sense of self can vary dramatically, largely in reaction to their social experiences with weight-control and body ideals in the local, immediate contexts of their daily lives (Christakis and Fowler 2007; Eisenberg et al. 2005; Milkie 1999; Nichter 2000; Paxton, Schutz, Wertheim, and Muir 1999; Pinhey, Rubenstein, and Colfax 1997). The role of one such local context - schools - has remained largely unexplored in existing literature, which is striking because, during adolescence, schools

serve as the primary context of adolescents' social and academic lives (Coleman 1961). Because schools draw together developmentally-similar adolescents for large amounts of time, they provide a social context that is ripe for observation, judgment and social comparison. The foods adolescents eat, the size of their bodies, the weight-control behaviors they verbally or visibly endorse, and their appearance can be observed and used to judge whether or not they fit in (Eder, Evans and Parker 1995; Jones 2001; Milkie 1999; Nichter 2000). Because physical appearance can play a powerful role in how adolescents experience life in schools (Crosnoe, Frank, and Mueller 2008; Crosnoe and Muller 2004; Eder, Evans and Parker 1995; Jones 2001; Milkie 1999; Nichter 2000; Paxton, Schutz, Wertheim, and Muir 1999), understanding how schools, as a bounded social institution, serve as a venue for the formation of weight-related cultures is crucial to promoting healthy behaviors among adolescents.

With this dissertation, I investigate the role high school weight cultures play in the development of adolescents' weight control behaviors, self-perceptions of weight, and self-esteem during adolescence. First, I examine who within the school context serves as a salient target for social comparison and how these comparisons shape weight-control behaviors and self-perception of weight. Second, I explore the emotional consequences of weight-related social comparisons in schools. To accomplish these research goals, I first discuss the existing literature on adolescent body image and social comparisons. In Chapter 2: Background, I discuss prior research on adolescent body weight focusing particularly on differences between boys and girls and on the importance of social comparisons. I also discuss why school contexts matter to adolescent health behaviors by reviewing a larger literature on school peer effects on health. Drawing from this literature, and incorporating research on adolescent development, I describe how it is that adolescent cultures in schools may affect adolescents' behaviors, values, and ideals. This

leads into a discussion of social comparison theories and how they provide a clear theoretical framework to employ when investigating the role of schools in adolescents' weight-control behaviors, self-perception of weight, and self esteem. Using social comparison theories, specifically the idea of who may serve as a likely target for social comparison – general others, similar others, or high status others - I develop hypotheses about which aspects of the school context may be associated with various aspects of adolescents' body weight.

Following Chapter 2, I devote a chapter to explaining my data and methodological approach (Chapter 3). My first analytic chapter, Chapter 4, discusses the findings that relate to weight-control behaviors for both boys and girls, while my second analytic chapter, Chapter 5, summarizes my findings that relate to adolescent self-perception of weight for boys and girls. Chapter 6, my final analytic chapter, presents my findings on the consequences of weight-related social comparisons in schools to adolescent self-esteem. I gather evidence from each analytic chapter to inform my conclusions, discussed in Chapter 7, regarding which groups of peers are the most salient targets for social comparison in the school context and how it is that the school context matters to adolescent health behaviors and emotional development. To investigate the role of schools in body weight, I use longitudinal data and a nationally-representative sample of adolescents in 78 public and private U.S. high schools from the National Longitudinal Study of Adolescent Health.

Specifically, my research aims are:

1. To examine the role of the school context in adolescents weight-control behaviors and self-perception of weight.
2. To determine the consequences of body weight social comparisons to schoolmates to adolescent self-esteem.

3. To inform which groups of adolescents are the most likely targets for social comparisons, namely, general others, similar others, or high status others.

Chapter 2: Background

Adolescent Body Weight

In the U.S., the body serves as a location where contradictory cultural norms play out. The American lifestyle frequently involves the consumption of high-caloric foods and being relatively sedentary (Christakis and Fowler 2007). This contradicts the powerful cultural norms in the U.S. that depict the ideal feminine body as slim and toned and the ideal male body as muscular and athletic (Jones and Crawford 2006; Littleton and Ollendick 2003). For adolescents, negotiating this potential contradiction can be a complicated and sometimes painful issue, especially if they perceive their body as deviating from normative body ideals. The prevalence of body image disturbance and inaccurate perceptions of weight suggest that many adolescents experience difficulty constructing a positive and healthy relationship with their bodies (Kilpatrick, Ohannessian, and Bartholomew 1999). Furthermore, the prevalence of overweight and obesity among adolescents is on the rise (Ogden, et al., 2002), though the pressure to be thin, athletic or muscular persists (Hargreaves and Tiggemann 2004; Humphries and Paxton 2004).

Gender, Race & Ethnicity, & Body Weight

When studying adolescence and body weight, gender differences in the social construction of the "ideal body" are extremely apparent in the reports of boys and girls across the U.S. For adolescent girls, being thin is generally considered ideal (Jones 2001; Jones 2004; Littleton and Ollendick 2003), while for adolescent boys, being muscular is generally highly valued (Cohane and Pope 2001; Humphreys and Paxton 2004; Jones 2004; Jones and Crawford 2006). Though boys' body concerns and weight control have received less attention in the academic literature than girls' (Cohane and Pope 2001;

Labre 2002; Ricciardelli and McCabe 2003), this trend is changing and recent research reports that boys experience body image disturbances that can have important consequences for their health and development (Labre 2002; Cohane and Pope 2001). A significant number of boys experience weight teasing and report body dissatisfaction (Jones and Crawford 2006; Ricciardelli and McCabe 2003).

Though muscularity is the most universal concern for boys, boys' body concerns also bifurcate based on boys' own weight status (Cohane and Pope 2001; Jones and Crawford 2006). Underweight boys or boys with low BMIs are more likely to want to improve their muscular build, whereas overweight boys are more likely to be concerned about dieting and losing weight (Jones and Crawford 2006). Having a low BMI or being underweight may be linked to pubertal status, where boys who are late maturers may be more driven to gain muscle to feel more in line with their more physically mature peers (Jones and Crawford 2005).

The diversity in boys' body concerns is interesting compared to the virtually singular focus of girls on losing weight and staying thin, regardless of girls' own BMI (Jones and Crawford 2005) or the timing of their pubertal development (Stice and Whitenton 2002). Low BMI or underweight girls almost never report wanting to gain weight, and though they are less likely than overweight girls to report wanting to lose weight, a significant number still report that desire (Jones and Crawford 2006; Stice and Whitenton 2002). This may be driven by the positive social rewards that girls receive for having a lower BMI (Jones 2001; Crosnoe, Frank and Mueller 2008). Similarly, underweight girls are the least likely to report body dissatisfaction, but some underweight girls still do report body dissatisfaction (Jones and Crawford 2006). Underweight boys, on the other hand, tend to experience negative social consequences for being

underweight, such as teasing, which can have painful emotional consequences (Jones and Crawford 2006).

Though there are these identifiable trends by gender in body ideals in the U.S., there are also important variations by race and ethnicity. African-American girls seem to have a more flexible definition of the ideal body than white girls (Milkie 1999; Nichter 2000). Additionally, African-American boys and girls are more likely to choose a heavier ideal body type for either gender (Lovejoy 2001; Nichter 2000). This flexibility means that African-American girls are more likely to be satisfied with their bodies (despite being heavier on average) (Ge et al. 2001; Milkie 1999; Nichter 2000; Nishina, Ammon, Bellmore and Graham 2006) and, even when African-American girls do perceive themselves as overweight, they are less likely to experience negative emotional consequences (Ge et al. 2001).

Though African-American adolescents generally experience protection against negative body images, this is not necessarily true for Asian-American or Latina girls (very little is known about Asian-American or Latino boys) (Neumark-Sztainer et al. 1999; Nishina, Ammon, Bellmore, and Graham 2006; Robinson et al. 1996). A large study of adolescent weight control found that approximately 40 percent of Asian-American and white girls were currently dieting, compared to 33 percent of Latina girls and 22 percent of African-American girls (Neumark-Sztainer et al. 1999). Though disordered eating was originally considered a white, middle-class problem, research now suggests that it is not an insignificant problem for girls of any race or ethnic group (Neumark-Sztainer et al. 1999). Further, there is some evidence that Latina and Asian-American girls may engage in disordered-eating and experience body dissatisfaction at the same rate as white girls (Neumark-Sztainer et al., 1999).

As the literature on race and ethnicity and adolescents body image stands now, very little is understood about how school contexts, which are sometimes racially integrated and sometimes very segregated, differentially impact adolescents' based on their own race or ethnicity. Though the data used in this dissertation includes a nationally-representative sample, it is beyond the scope of the dissertation to fully investigate how the school context differs for adolescents of different race and ethnic backgrounds based on their match with the context (primarily because too many schools have little race and ethnic variation despite the nationally-representative nature of the sample as a whole). That said, the data employed here provide a good opportunity to ensure that I can operationalize my hypotheses developed in the coming pages net of the effects of race and ethnicity at both the individual and school levels. I discuss this at greater length in Chapter 8: Conclusion.

Appearance Cultures, Social Comparisons & Body Weight

Though the gendered focus on being thin or muscular is almost universally visible on TVs, in magazines and movies, adolescents interpret these national messages in part through the body ideals they report perceiving in the contexts of their daily local lives (Milkie 1999; Jones and Crawford 2006). The perceived peer appearance culture that surrounds them in their schools can set the tone for building muscles or practicing weight control just as much as images prevalent in the media (Jones 2001; Jones, Vigfusdottir, and Lee 2004). While a strong peer appearance culture for girls generally has a singular focus on weight and being thin, for boys the focus can be two fold - on weight (avoiding overweight by losing weight) and/or muscularity (avoiding underweight by building muscle and gaining bulk) (Jones and Crawford 2006). Regardless of the focus of peers (on muscularity or weight), boys who perceive their peers as focused on general

appearance concerns are more worried about their own weight (than boys in more neutral contexts), and boys who talk with friends about building muscles are more likely to be concerned with muscularity and bulking up (Jones and Crawford 2006).

Because many adolescents, especially girls, report feeling frequently judged on their physical appearance, the pressure to conform to the appearance culture of their peer contexts can feel significant, particularly since conformity can earn them greater acceptance with their peers (Eder, Evans and Parker 1995; Jones 2001; Milkie 1999; Nichter 2000; Paxton, Schutz, Wertheim, and Muir 1999). Even though adolescent girls report comparing their bodies to the bodies of other girls more frequently than boys, comparisons to peers on weight attributes has been linked to both boys' and girls' body dissatisfaction (Jones 2001). In addition to providing feedback on individual's status, research has shown that adolescents use body comparisons to gather information on peer weight-related values, ideals, and behaviors (Jones and Crawford 2006; Paxton et al. 1999; Ricciardelli and McCabe 2003; Jones 2001; Jones et al. 2004).

Overall, the research on social comparison and adolescent body image has established that social comparisons are an important tool that adolescents use to determine how they feel about their bodies and that have serious consequences for body dissatisfaction. There are three limitations to the existing research. First, much of the important conclusions have been reached using small non-representative samples or qualitative methods. Though this has provided rich in-depth measures and insights from interviews with girls and boys about weight control and body image, very little work has examined the role of social comparisons using a nationally representative sample of adolescents and schools. Second, this research generally relies heavily on adolescents' reports of their peers' activities (thus, research measures the *perceived* peer appearance context). Third, past research has neglected to investigate whether schools as a whole

provide opportunities for social comparisons. Because adolescents' social worlds are so focused on schools and adolescence is a crucial time in the foundation of long term health behaviors, understanding how the school culture affects weight control, self-perception and well being is crucial to promoting healthy lives.

WHY MAY SCHOOLS MATTER?

With this dissertation, I extend previous research on social comparisons of adolescent's bodies by investigating how it plays out in the school context as a whole using nationally-representative data of students clustered within schools. But first, I turn to a discussion of why is it that the school context may matter to adolescents' weight control, self-perception and ultimately self-esteem.

School Contexts and Health Behaviors

There is good reason to investigate the role of schools in encouraging adolescents' weight-control behaviors. Schools, as bounded social institutions that bring together students for large amounts 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's 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 2000; Eisenberg, and Forster 2003; Ellickson, Bird, Orlando, Klein, and McCaffrey 2003; Alexander, Piazza, Mekos, Valente 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 they are 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. 2000). 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. 2000). Bearman and Brückner (2001) found a similar pattern in their study of adolescent sexual behavior: 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 shaper of 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. 2000). 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 adolescents' weight control or self-perception 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 may influence adolescents' weight-control behaviors and self-perceptions 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" that provides important opportunities for adolescents to develop intimacies, experience social acceptance, 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; Ricciardelli & McCabe 2001; Stormer & Thompson 1996), 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 this audience is not necessarily characterized by intimacy, frequently involves a status hierarchy (such as popularity), and often provides information (sometimes unsolicited information, such as 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 as a whole more influential to adolescents' decisions to lose weight than their experiences in the potentially more supportive context of friends. Peers in the wider network may serve as a more salient target for social comparison as adolescents 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 high school.

Social Comparison Theory & High Schools

Social comparison theories emphasize that individuals gather information about the self from the characteristics of others and then judge themselves based on how they measure up to targets of comparisons (Festinger 1954). Social comparison refers to the process that occurs as an individual observes her social context, identifies comparison others within that context, and based in part on the choice of comparison others, decides how she measures up (Festinger 1954). Another important aspect of the social comparison process is that it generally results in emotions about the self (Cooley [1902] 1922; Rosenberg 1979). If the comparison is positive, it might evoke feelings of pride or happiness; alternately, a negative comparison, may cause feelings of shame or distress.

Given the characteristics of schools– the vast amount of time that adolescents spend in the social group, the bounded nature of the institution, the formal and informal judgments that are a frequent part of the institution, and the fact that schools cultivate a sense of identity in their students (through competitions with other schools or alumnae gatherings) (Akerlof and Kranton 2002) – and the characteristics of adolescence – the intense need for both social acceptance and independence from families (Giordano 2003) – it is reasonable to expect that the school context may amplify the importance of social comparison processes. As adolescents strive to fit in to the primary extrafamilial social context of their daily lives, social comparisons provide a useful and potentially powerful tool to obtain information on peer values and ideals.

There are several enduring questions suggested by social comparison theories that are relevant to investigating the role of schools in adolescents' body weights. With this dissertation I attempt to add to the existing literature that investigates the question: who within the social world of high schools serves as a salient target for social comparison? In general, social comparison theory suggests that adolescents 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). To develop more concrete hypotheses with regard to these questions I turn to specific tenets of social comparison theory that will serve as my theoretical framework throughout my analytic chapters.

General Others

Sharing a school often means sharing a culture and an identity for its students (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 same-sex peers because the different weight ideals for boys and girls suggests that same-sex peers are more likely comparison targets (Jones 2001)). This process of social comparison – to all other same-sex peers – 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, I anticipate that all schoolmates are not likely to provide a pathway for evaluating similarity or the role of proximity. Rather this pathway represents the most general social comparison process – to all general others in the shared space of the school. It helps me answer the question, do school contexts matter?

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 dissimilar (Festinger 1954). Later work has confirmed, at least when subjects are extremely familiar with the attribute under evaluation, as is likely the case with adolescents and body ideals, similarity is a strong driving force between subjects and their targets of comparison (Wheeler, et al. 1969). The centrality of weight to how adolescents feel about their bodies (Jones 2001; Neighors, Sobal, Liff and Amiraian 2008) suggests that it is likely that it is a significant visible marker of similarity within the school context. Thus, adolescents may determine similar others by identifying same-sex peers who are similar to them in terms of body weight - the trait they are aiming to evaluate (Wood and Taylor 1991). Thus, adolescents may be only responsive to the characteristics of others of a similar weight status.

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 adolescents use social comparison to determine what is culturally-valued and socially-rewarded within their school (Jones 2001). Because friendships are essentially the currency of adolescence, investigating whether or not popular adolescents serve as salient targets for social comparison may be informative. If adolescents are motivated by conforming to behaviors that may earn them social status, they may be more likely to conform to the behaviors of popular adolescents. If this is the case, I would expect to find

that adolescents' weight-control behaviors, self-perceptions and self-esteems are associated with the characteristics and behaviors of popular adolescents.

Linking Social Comparisons to Key Aspects of Adolescents' Body Concerns

In order to investigate who within the school context serves as a salient reference for social comparison, I investigate three key aspects of adolescents' body concerns: weight-loss behaviors, overweight self-perception, and self-esteem. Separately, these aspects of adolescent development are interesting and have important health implications. For example, accurate weight perception is necessary to making good weight-control decisions. Further, inaccurate weight perception can be a risk factor for emotional distress (Frisco, Houle, and Martin 2010). In the face of the rising epidemic of adolescent obesity, understanding when and how adolescents decide to practice weight control is of primary importance to public health. And finally, when adolescents feel bad about their bodies it sometimes spills over into feeling bad about their global self-worth (their self-esteem) (Ge et al. 2001; Swallen, Reither, Haas, and Meier 2005; Perrin, Boone-Heinonen, Field, Coyne-Beasley, and Gordon-Larsen 2010). So independently, these three dependent variables are interesting, but when analyzed together, because of the differences between them, they allow me to piece together a greater picture of why schools matter to adolescent health and how social comparison theory may inform when and how schools matter.

Weight-Loss Behaviors

My first analytic chapter, Chapter 4, investigates adolescents' weight-loss behaviors. From a public health perspective, understanding how adolescents learn to practice weight-control is essential. But from a sociological perspective, behavior is sometimes an interesting tool that individuals use to fit in to their social groups.

Behaviors, like weight-loss behaviors, are sometimes internalized into an indivdiual's belief system – such that they truly believe they need to lose weight and that losing weight is an important goal – but other times, adolescents may use weight-loss behaviors to conform to the values they perceive around them in their social groups. In other words, behavior is often public and observable – in the foods adolescents eat in the lunchroom or the activities they engage in. Because behavior is observable, there is an opportunity for it to be taken as a sign of conformity to the values of a social group which may result in positive rewards – or when behaviors deviate from those valued by the group, social sanctions may come into play (Coleman 1990). Because behaviors can be used to express conformity and avoid the consequences of standing out, there is also an opportunity for a mismatch between an individual's true feelings about ideal weight and the behaviors they engage in. The visible nature of behavior renders it malleable to social groups and an interesting aspect of adolescent life to study.

Self-Perception of Weight

My second analytic chatper, Chapter 5, investigates adolescents' overweight self-perceptions. An adolescents' self-perception of weight is be considered an important element of both body image and body dissatisfaction because of the centrality of weight in sociocultural representations of gendered body ideals (Neighors, et al. 2008). Psychologists argue that the evaluation of body weight – e.g. identifying one's body weight as overweight or underweight or a healthy weight – involves an adolescent referencing their knowledge of more objective, clinical definitions of overweight and their subjective feelings about the definition of ideal weight or overweight (Neighors et al. 2008). The result is that self-perception of weight can have consequences for how adolescents feel more generally about their self-worth and can influence whether or not

adolescents engage in weight-change behaviors (Neighbors, et al. 2008). The subjective aspect of weight self-perception renders it interesting because it suggests that self-perception taps a more private aspect of adolescent identity than adolescents' weight-control behaviors. It is not easily observable and thus, it may be less subject to change solely for the purpose of appearing to conform. As such, self-perception investigates how adolescents see themselves in relation to the social context surrounding them and therefore may be more likely to reflect an internalization of values regarding ideal weight than adolescents' weight-control behaviors.

Global Self-Esteem

My final analytic chapter, Chapter 6, investigates the link between adolescents' overweight self-perception and self-esteem and whether or not school contexts moderate the experience of overweight self-perception. Investigating the link between overweight self-perception and global self-esteem is of potentially great interest. Global self-esteem, is a measure of an adolescent's overall sense of self-worth, "or a generalized feeling of self-acceptance, goodness, worthiness, and self-respect" (Crocker and Major 1989: 609). It is widely recognized to be a key aspect of psychological functioning and is associated with other measures of quality of life, such as life satisfaction (Crocker and Major 1989). Self-esteem is not always linked to a self-evaluation of one specific trait such as self-perception of weight. Individuals are capable of feeling negatively about one aspect of their self without allowing it spill over into their global self-esteem (Crocker and Major 1989; Marsh 1986; Rosenberg 1979). Research has shown that overweight self-perception is sometimes, but not always, linked to lower self-esteem among adolescents (Ge et al. 2001; Swallen, Reither, Haas, and Meier 2005; Perrin, Boone-Heinonen, Field, Coyne-Beasley, and Gordon-Larsen 2010). An additional way to understand when

overweight self-perception affects global self-esteem may be to incorporate the values and body ideals present in the primary social context of daily life in adolescence into the analytic framework. In other words, do differences in the cultures of weight in schools help explain whether or not an adolescent experiences overweight self-perception as harmful to self-esteem? The circumstances under which the school context either protects or exacerbates the link between overweight self-perception and global self-esteem, may be highly indicative of salient sources of social comparison. With this analytic pathway, I investigate which peers within the school are associated with how an adolescent estimates their own sense of self worth. As we progress through the analytic chapters, we move deeper towards an internalization of the body ideals present in the school context, and as we take those analytic steps forward, we will learn more about social comparison theories as we go.

Ultimately, I do find that the school context matters for adolescents' weight-control, self-perception and self-esteem. To briefly summarize my findings relating to social comparison theories, I find a significant amount of support for the importance of similar others and general others in both adolescent boys and girls' lives when it comes to issues relating to their weight in the school context. I do not find much support that high status others, as defined by popularity, are particularly influential. Adolescent weight-control behaviors are the most associated with the school context, while self-esteem, the dependent variable that captures the most internalized aspect of adolescents' values – is the least. Interesting gender differences also emerge and are discussed fully in the coming chapters.

SUMMARY

In summary, to investigate the role of schools as a location for social comparison and its consequences to adolescent weight-control, self-perception and self-esteem in adolescence, I examine three types of potential social comparison processes: 1) comparisons to general others; 2) comparisons to similar others, defined by same-sex peers of similar weight statuses; and 3) comparisons to high-status others. To explore these pathways, I use longitudinal data and a nationally-representative sample of adolescent boys and girls in approximately 77 public and private U.S. high schools.

Chapter 3: 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 U.S., 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 7^{th} 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 I (n=20,745) slightly after the In-School Survey (in 1994-95); Wave II followed in 1996 and collected information from 14,738 of the participants from Wave I. 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 Harris et al. (2009).

SAMPLE SELECTION

I employ several selection filters to determine my final analytic sample. Because the complex sampling design of Add Health requires that weights be used in analyses, my first selection filter eliminates students who are not assigned a valid sample weight at Wave II. Additionally, because I conduct longitudinal analyses, I confine my analysis to

adolescents who participated in both Wave I and II in-home interviews (n=13,568). This excludes most students who were seniors at Wave I (as most seniors were no longer in school and were not followed up by Add Health at Wave II). I also limit my sample to high-school students so that I did not have students transitioning between schools (from middle to high school) between Waves I and II. This reduces my sample to 8,642. While these selection filters have the potential to bias our results, they allow me to explore critical aspects of body weight in schools.

To gauge any potential bias, Table 1 (below) presents the means on key variables for the original Wave I samples (presented by gender) and my analytic samples (by gender). Overall, my analytic samples do not vary dramatically from the original Wave I samples. Further, the excluded respondents' demographic characteristics (not shown in the table) are extremely similar to both the analytic sample and the Wave I samples (for both boys and girls). The only significant demographic differences between the samples are that adolescents who live with both biological parents, Asian-Americans and Latina/os were significantly less likely to be excluded than White Americans; though the difference in likelihood was quite small (these data are available from the author upon request).

Table 1: Weighted Descriptive Statistics for Key Variables for Add Health Wave I High School Sample and Analytic Sample by Gender

	Girls				Boys			
	Wave I Sample		Analytic Sample		Wave I Sample		Analytic Sample	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age, Wave I	16.36	0.93	16.36	0.91	16.55	0.97	16.55	12.99
Latina/o	0.12		0.12		0.13		0.13	
African American	0.17		0.16		0.16		0.15	
Asian American	0.04		0.04		0.05		0.05	
Other Race or Ethnicity	0.03		0.03		0.03		0.03	
White	0.65		0.65		0.64		0.64	
Lives with Two Biological Parents	0.53		0.54		0.54		0.56	
PVT	100.41	14.32	100.89	13.77	102.07	13.26	102.70	12.99
Parents' Average Education Level	2.80	1.19	2.81	1.19	2.83	1.15	2.85	1.15
BMI above the 85th Percentile, WI	0.23		0.23		0.28		0.28	
BMI below the 25th Percentile, WI	0.15		0.12		0.14		0.14	
Weight-Loss Behaviors, WI	0.48		0.49		0.19		0.20	
Weight-Loss Behaviors, WII	---		0.47		---		0.19	
Overweight Self-Perception, WI	0.42		0.42		0.21		0.22	
Overweight Self-Perception, WII	---		0.42		---		0.21	
Low Self-Esteem, WI	0.23		0.23		0.13		0.13	
Low Self-Esteem, WII	---		0.16		---		0.10	
N (Individuals)	5231		3984		5211		3819	
Source: The National Longitudinal Study of Adolescent Health								

MEASURES

Dependent Variables

Chapter 4: Dependent Variable

The dependent variable for my first analytic chapter (Chapter 4) captures adolescents' *Weight-Loss Behaviors* at Wave II is based on the adolescent's response 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 identifies girls who are likely to be practicing some form of weight control in order to lose weight.

Chapter 5: Dependent Variable

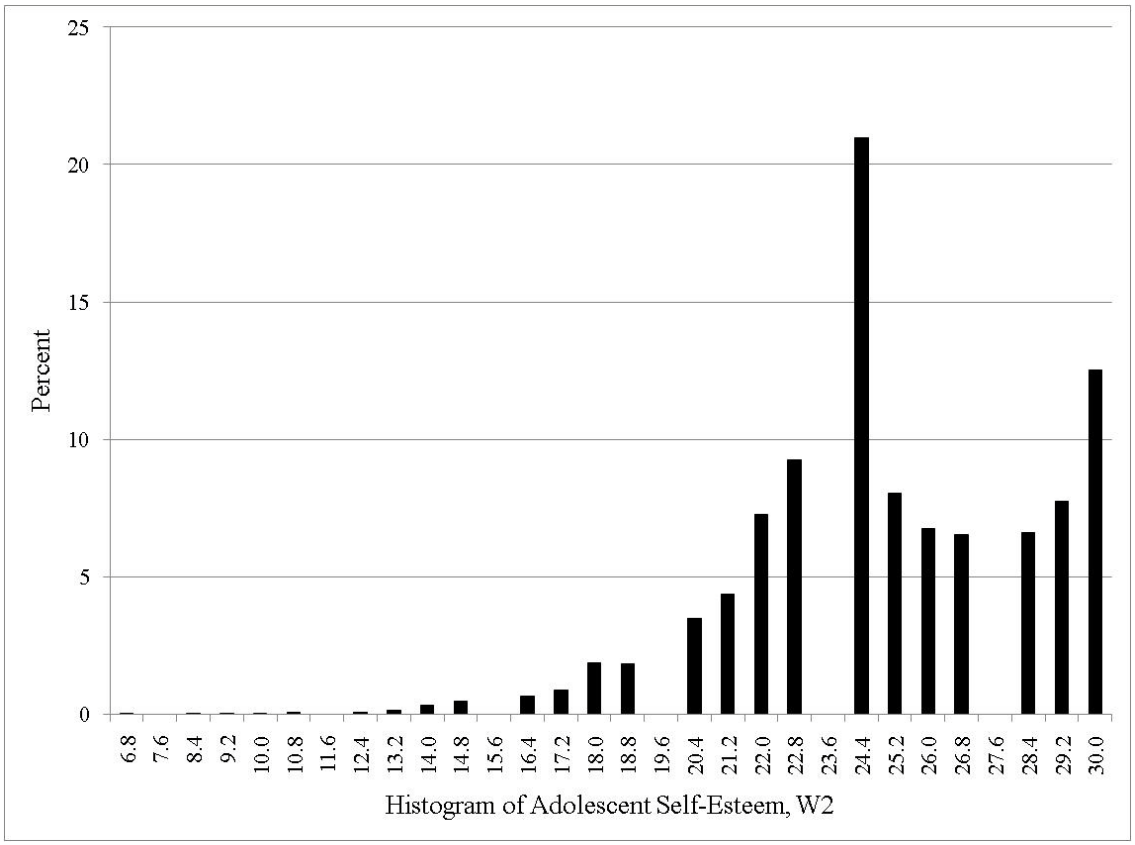
The dependent variable in my second analytic chapter (Chapter 5) is *Overweight Self-Perception* at Wave II and is based on adolescents' responses to the question "How do you think of yourself in terms of weight?" The answers ranged from 1 meaning "very underweight" to 3 meaning "about the right weight" and 5 meaning "very overweight." Adolescents who answer either "slightly overweight" or "very overweight" are coded as 1 for a dichotomous variable representing that the adolescent perceives themselves as overweight.

Chapter 6: Dependent Variable

The dependent variable in my third analytic chapter (Chapter 6) is, *Low Self-Esteem, Wave II*, and is measured by the sum of six items where a high score indicates high self-esteem (Cronbachs alpha=0.85). The items are taken from an abridged form of the Rosenberg Self-Esteem Inventory and represent a measure of global self-esteem (Rosenberg 1965). The items are: (1) You have a lot of good qualities; (3) You have a lot to be proud of; (4) You like yourself just the way you are; (5) You feel like you are doing everything just about right; (6) You feel socially accepted; (7) You feel loved and wanted. Figure 1 (below) presents a histogram depicting the distribution of the self-esteem scale at Wave II. As is evident in Figure 1, fifty percent of adolescents score at or above a 24 (out of 30) on this scale. Thus, the majority of adolescents report relatively high levels of self-esteem. What is also apparent from the histogram is that distribution of

self-esteem is positively-skewed, with adolescents clustered on the higher end of the self-esteem scale than the low end and that it is not normally distributed. To cope with the non-normal distribution, the scale was dichotomized. Respondents who scored one standard deviation below the mean for their same-sex group were coded as 1 on a

Figure 1: Histogram Presenting the Distribution of Adolescent Responses on the Self-Esteem Scale at Wave 2



dichotomous variable indicating *Low Self-Esteem*. Sixteen percent of girls and nine percent of boys in grades 9, 10, and 11 have low self-esteem according to this criterion (at Wave II). Perrin et al. (2010) and Shrier, Harris, Sternberg, and Beardslee (2001) used a similar method to analyze self-esteem although they used a less discriminating cut-off

point (2010). Both articles defined adolescents with low self-esteem as adolescents who were above the median (on a scale where a high value on the scale indicated *low* self-esteem) (Perrin et al. 2010; Shrier et al. 2001). Because the median value of self-esteem is still quite high (e.g., 24 out of a max value of 30 for female adolescents at Wave I), analyzing adolescents who scored one standard deviation below the mean may more accurately capture adolescents with low self-esteem. This method is similar to methods used to analyze emotional distress as a dependent variable. Like self-esteem, emotional distress has a highly skewed distribution, with the majority of adolescents reporting low levels of distress (Frisco, Houle, and Martin 2010; Langenkamp and Frisco 2008; Swallen et al. 2005). Importantly, supplementary analyses were run with other definitions of low self-esteem to ensure that the choice of one-standard deviation below the mean was not driving the results. The results remained stable regardless of how low self-esteem was defined.

Individual-Level Independent Variables

A consistent set of independent variables are used in all analyses across analytic chapters. The only exception is that in analytic Chapter 6, the models include overweight self-perception as a key independent variable, whereas this variable is excluded from models in Chapter 4 and 5.

In all analytic chapters, my primary individual-level independent variable is adolescents' body mass index. To calculate BMI, self-reported height and weight of adolescents at Wave I were used in the formula {[weight (pounds) / height (inches)^2] * 703}. Using the weight*age*gender tables provided by the Center for Disease Control (2000) for adolescents, I identify overweight adolescents (for their age-gender group) (those in the 85th percentile or above of BMI) and underweight adolescents (those in the

25th percentile or below of BMI). The threshold for overweight is set by the CDC (2000). I follow prior research and identify underweight adolescents as adolescents at or below the 25th percentile for their age (Jones and Crawford 2006; Mueller et al. 2010). Though the threshold for underweight is above the clinical definition of underweight, this study is not concerned as much with malnourished or dangerously thin adolescents. Instead, I am interested in identifying whether similarity, social status, or shared membership in a school motivates behavior, self-perception, and well being. In this spirit, capturing the low-end of the BMI distribution (the first quartile) in order to identify thin adolescents is more crucial to the theoretical argument than correctly identifying adolescents whose health is at risk because of being clinically underweight.

Because individual factors can either place adolescents at-risk or protect adolescents 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 me to better isolate the roles of schools. Cognitive skills may serve as a protective factor against body image problems (Littleton and Ollendick 2003). Therefore, I control for adolescents' score on the Peabody Picture Vocabulary Test (PVT) at Wave I. Sports participation may affect girls' body dissatisfactions (Smolak, Murnen, and Ruble 2000), likelihood of engaging in weight control, and the accuracy of BMI as a measure of their weight status; thus, I control on whether adolescents participated in sports during high school. Adolescents' pubertal development can put them at risk of body dissatisfaction, possibly particularly for adolescent boys; therefore, all models control on adolescents' self-reported pubertal status (Jones and Crawford 2005). All variables are taken from Wave I survey except participation in sports, which was obtained from the In-School Survey. All models include the adolescent's age at Wave I, race and ethnicity, parents' highest education level, and whether or not the adolescent was engaged in a romantic

relationship. Self-esteem was not used as a lagged control in models where self-esteem was the dependent variable; rather it was used as an independent variable only in models where weight-loss behaviors and overweight self-perception were the dependent variables.

Because African-American adolescents are less likely to feel pressure to lose weight, I control for race and ethnicity (Ge et al. 2001; Lovejoy 2001; Milkie 1999; Nichter 2000). Race and ethnicity is coded as five dichotomous variables: Latina, Black, Asian, and Other, with White as the reference category. Because social class may affect adolescents' desires to be thin and their likelihood of being overweight (Dornbusch et al. 1984; Mirowsky and Ross 2003), I control for whether or not the adolescent lives with both biological parents and for the adolescents' 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) less than high school graduation; (2) high school diploma or equivalent; (3) some college, but did not graduate; (4) graduated from a college or university; and (5) professional training beyond a four-year college or university. To additionally capture the role of families, I control for whether the respondents' parents perceive their child as overweight. This measure is parent reported.

Missing Data on Independent Variables

Two independent variables had a substantial amount of missing data: sports participation and parents' report of child's weight status. Because these data are not missing at random, it is not appropriate to use multiple imputation to recover the missing

data. Instead, students who were missing information on these variables were given the modal value and a flag was created indicating this had been done. The missing flag was included in all models, though it is not reported in the tables and none of the flags ever reached statistical significance. This substitution did not appear to affect estimates (models run using Sports Participation and Parents' Perception of Child's Weight with and without the modal substitution were similar, except for the sample size).

School-Level Independent Variables

A standard set of school-level variables was created using the same procedure to analyze the research questions for each analytic chapter (Chapter 4, 5 and 6). To create the school-level variables, individual scores are averaged at the school level to create a variable that represents the proportion or an average of a behavior or characteristic (like BMI) in the school. Add Health's entire Wave I sample is used to construct school-level measures. For all school-level variables, the average is weighted by the Wave I sample weight to account for each individual's probability of being sampled. Using this procedure (aggregating the Wave I student responses to the school level), I constructed the school-level variables: the *Proportion of Overweight Same-Sex Peers, Proportion of Same-Sex Peers Trying to Lose Weight*, *Proportion of Underweight Same-Sex Peers, the Proportion of Underweight Same-Sex Peers Trying to Lose Weight, the Proportion of Overweight Same-Sex Peers, and the Proportion of Overweight Peers Trying to Lose Weight*, *Average BMI of High Status Same-Sex Peers; Proportion of High Status Same-Sex Peers that are Trying to Lose Weight*. Virtually all variables are used in every analytic chapter, though Chapter 5, which explores adolescents' overweight self-perception, called for a few variables unique to the development of perception (particularly accuarate and inaccurate perception of overweight): *Proportion of Same-Sex*

Peers who Misperceive a Healthy Weight as Overweight; Proportion of Same-Sex Overweight Peers who Perceive Themselves as Overweight; Proportion of Same-Sex Underweight Peers who Perceive Themselves as Underweight.

Finally, because African-American adolescents often have different experiences regarding body weight and self esteem (Ge et al. 2001; Milkie 1999; Nichter 2000) and because a school with many African-American adolescents may have different body ideals, I include a control in all models for the proportion of African-American students in the school. Additionally, because the ability to observe peers is key to the theoretical perspective argued in this study, I control on school size with a dichotomous variable indicating *Large* S*chools*. In larger schools it may be more difficult to observe the student body surrounding an individual student. I explored whether other school controls were important; however, these two controls were the only two that impacted estimates. Therefore, in final models, the *Proportion of African American Same-Sex Peers* and *Large School* are the only additional school-level control in the model.

Linking School-Level Variables to the Research Questions

To test my first overarching hypothesis (the role of general others), I use the proportion of same-sex peers in the school that report trying to lose weight and the proportion of overweight same-sex peers in the school. These are broad measures that characterize all adolescents in the school, regardless of their weight status as underweight or overweight and thus are not likely to capture adolescents recognition of similar or high-status others. Further, I test the direct effect of these variables on adolescents' outcomes.

To test my second overarching hypothesis (the role of similar others), I use *Proportion of Underweight Same-Sex Peers, Proportion of Underweight Same-Sex Peers*

Trying to Lose Weight, and Proportion of Overweight Same-Sex Peers, and the Proportion of Overweight Same-Sex Peers Trying to Lose Weight. As I describe in more detail below in my analytic plan, I estimate cross-level interactions to see if the effect of same-weight status peers' characteristics are associated with an individual's behavior, self-perception and self-esteem, suggesting that similar others are in fact a more likely target for social comparison.

Finally, I use the same modeling strategy (cross-level interactions), but slightly different variables to explore the role of social status in social comparison. I use the proportion of high-status same-sex peers in the school that report trying to lose weight and average BMI of high status peers to investigate this research question. My goal is to determine whether or not the average BMI and behaviors of high-status peers is associated with individuals' behavior, self-perception and self-esteem.

Though ideally I would be able to test these theoretical pathways against each other in order to determine which set of potential comparison others matters the most within the school context, because the measures of the school context are to some extent correlated and my degrees of freedom at the school level are only 78 for boys and 77 for girls, it is not realistic to expect this out of the data. For example the correlation between the average BMI of all boys in the school and all popular boys in the school is highly statistically significant and r=0.50. The variables are not identical, but they are correlated substantially enough that we could expect problems with multicollinearity. With that caution in mind, I do find extremely interesting patterns in the link between adolescents' behaviors, self-perceptions and self-esteem that aline with social comparison theories.

ANALYTIC PLAN

In my three analytic chapters, I use a similar analytic strategy. To discuss this strategy, I use the dependent variable, Weight-Loss Behaviors (WLB_{ij}) from my first analytic chapter (Chapter 4) as an example. According to my conceptual model, I predict that WLB_{ij} are influenced by the weight-related culture of the same-sex peers in an individual's school. Because past research suggests that adolescents will be more likely to reference their same-sex peers than cross-gender peers, and because the relationships among weight-loss behaviors and BMI status may be different for boys and girls, all models will be estimated separately for boys and girls (Ge et al. 2001; Jones 2001).

To investigate my conceptual model, I estimate multi-level models predicting WLB_{ij} with individual and school-level variables.

As a first step, I estimate a two-level, unconditional model (Raudenbush and Bryk 2002) to explore whether there is significant variation between schools in WLB_{ij}. The equation for the formal unconditional model for student i in school j is:

$$Log\,[\,p(WLB_{ij}=1)/(1-p(WLB_{ij}=1))] = \beta_{0j} \qquad (1)$$

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 between schools (which is assumed to be normal with variance τ). The intercept (β_{0j}) has a subscript j which indicates that each school in my sample has a unique intercept. From this I estimate the amount of variation between schools on my dependent variable (WLB_{ij}) (Raudenbush and Bryk 2002). I find

significant variation in WLB_{ij} (and all other dependent variables for both boys and girls) between schools supporting my attempts to explain some of this variation with my school-level variables.

Next, I expand (1) to include individual-level variables (such as, BMI_{ij}):

$$Log\,[\,p(WLB_{ij}=1)/(1-p(WLB_{ij}=1))] = \beta_{0j} + \beta_{1j}\,BMI_{ij} \qquad (3)$$

I can also expand (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):

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\,School\ Proportion\ of\ Overweight\ Adolescents_j + u_{0j} \qquad (4)$$

γ_{01} represents the effect of the proportion of overweight girls in the school ($School\ Proportion\ of\ Overweight\ Same\text{-}Sex\ Peers_j$) on individual weight-loss behavior (WLB_{ij}). Theoretically, individuals in schools with different values of the $School\ Proportion\ of\ Overweight\ Same\text{-}Sex\ Peers_j$ variable, on average, will experience different likelihoods of engaging in weight-loss behaviors (WLB_{ij}) themselves.

Key to the theoretical framework developed in this study - particularly to evaluate the role of similar others - is estimating whether or not the school-level variables moderate the effect of individual-level variables on the dependent variable. To do this, I estimate cross-level interactions between individual independent variables (e.g., BMI_{ij}) and the school-level independent variables. This allows me to examine whether the school culture moderates the relationship between independent and dependent variables (Raudenbush and Bryk 2002).

All models are estimated with the HLM6 software (Raudenbush, Bryk, Cheong, and Congdon 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 probability of engaging in weight-loss behaviors (or having an overweight self-perception or low self-esteem) for the hypothetical adolescent who is average on all variables (Raudenbush and Bryk 2002). I include the Wave II student-level weights normalized at the individual level. These weights compensate for Add Health's sampling design and for sample attrition and make the results more representative of the nation than in unweighted analyses. I report the Laplace estimates as they provide more robust and accurate estimates for logistic regression models with HLM (Raudenbush, Yang, and Yosef 2000).

ADD HEALTH'S STRENGTHS AND LIMITATIONS

To my knowledge, the Add Health data is the only data source that provides an opportunity to answer the research questions outlined in this dissertation. The large within-school samples allow researchers to gauge the adolescent culture of the school, while the nationally-representative sample of both students and schools ensure that to some extent my findings are representative of the experience of adolescents in the U.S. in the 1990s. However, there are also limitations to the data. The first limitation is perhaps the most important: The Add Health dataset is over ten years old; however, it remains the only nationally-representative dataset, to my knowledge, where it is possible to assess the role of school context on adolescents' body weight and health behaviors. A second limitation is related to the survey design. Interviewer-reported weight and height were not available until Wave II. However, self-reported weight and height is highly-correlated with interviewer-reported measures, and in most analyses, in order to ensure accurate

time order, I relied on adolescents' self-reports of their weights and heights. In an ideal study, weight and height would be objectively measured; however, 96% of adolescents in Add Health are correctly classified as overweight using self-reported height and weight (Goodman, Hinden and Khandelwal 2000). In general, my substantive conclusions do not change if I relinquish a longitudinal framework and conduct a cross-sectional analysis using interviewer-reported height and weight.

Ultimately, the strengths of Add Health outweigh the potential limitations. The large within-school samples provide an almost unprecedented opportunity to complete a quantitative analysis of social-psychological processes in adolescence. School contexts matter to a variety of aspects of adolescent development. With this dissertation, I am able to examine whether patterns exist across schools and adolescents that may help us understand social-psychology, the interaction of individuals and groups, and how adolescents' behaviors and global self-esteems are shaped by their schools.

Chapter 4: Social Comparisons, the School Context, and Weight-Control Behaviors

A substantial number of adolescents engage in unnecessary weight-control behaviors, such as trying to lose weight when they are not overweight. Research has shown that unnecessary weight-control behaviors can put adolescents at risk for a variety of health and mental health problems. At the same time, in light of the current obesity epidemic among adolescents (and adults), promoting and understanding adolescent weight control is important for the health of the U.S. in the long run. With this chapter, I investigate the school context as one location where adolescents learn weight-control behaviors.

General Others

Table 2 (Models 1 and 2) explore my first hypothesis that all same-sex peers are relevant as social comparison targets that shape adolescents weight-loss behaviors within the school context. Model 1 investigates this process among adolescent girls, while Model 2 investigates an equivalent model for adolescent boys. The findings are strikingly similar. Both adolescent boys' and girls' weight-loss behaviors are associated with the characteristics of their same-sex schoolmates. Specifically, as the proportion of overweight girls or boys in the school increases, the likelihood that an individual boy or girl in that school is trying to lose weight decreases. Predicted probabilities are often a useful way to interpret logistic regression coefficients. All predicted probabilities in this dissertation are calculated using the formula $\pi(x) = \exp(\alpha + \beta x)/[1+ \exp(\alpha + \beta x)]$. In Table 2, Model 1, adolescent girls have a predicted probability of 0.46 of trying to lose weight, net of all other variables, when they attend schools where 23% of the female student body is overweight (the mean level in my sample). This probability decreases to

0.42 for girls who attend schools with an above average proportion of overweight girls in the student body (specifically, when 33% of the female student body is overweight – one standard deviation above the mean) (Table 2, Model 1, Row 1). For girls in schools with a below average proportion of overweight girls (13% or one standard deviation below the mean in my sample), the predicted probability of a girl trying to lose weight is significantly higher (0.50). For adolescent boys, the predicted probability that a boy will report trying to lose weight, net of all other variables, on average, decreases from 0.13 to 0.11 as the proportion of overweight boys in the school increases from the mean (0.28) to one standard deviation above the mean (0.35) (Table 2, Model 2, Row 1).

Among girls, there is a marginally-significant association between the proportion of girls in the school who are trying to lose weight and an individual girls' weight-loss behaviors, net of all other variables (and the effect is positive, such that the more girls in the school who are trying to lose weight, the greater the likelihood that an individual girl in the school is trying to lose weight herself). This effect is statistically significant among adolescent boys. Holding all other variables constant, boys have a 0.13 predicted probability of trying to lose weight in a school where 19% of the male student body is trying to lose weight (the mean level for my sample). In schools where the percent of boys in the school is one standard deviation above the mean (or where 25% of boys are trying to lose weight), boys have a higher probability of trying to lose weight (0.18). In schools where only 13% of the male student body is trying to lose weight (one standard deviation below the mean), boys have an even lower predicted probability of trying to lose weight (0.10).

Table 2: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Weight-Loss Behaviors, WII: Investigating the Role of General Others in the School Context

		Girls			Boys		
		Model 1			Model 2		
Row	School-Level Variables	B	SE		B	SE	
1	Proportion of Overweight Same-Sex Peers	-1.637	0.565	**	-3.305	1.303	*
2	Proportion of Same-Sex Peers Trying to Lose Weight	1.423	0.731	+	5.658	1.561	**
3	Proportion of Same-Sex African-American Peers	0.186	0.286		0.597	0.351	+
4	Large School	-0.005	0.101		-0.057	0.141	
	Individual-Level Variables						
5	Overweight BMI, WI	1.432	0.121	***	1.954	0.098	***
6	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---	
7	Underweight BMI, WI	-1.555	0.153	***	-1.547	0.377	***
8	Low Self-Esteem, WI	-0.149	0.055	**	0.388	0.218	+
9	Parents' Perceive Adolescent as Overweight	0.952	0.271	**	1.266	0.262	***
10	Missing Parents' Perception of Overweight	-0.001	0.128		0.295	0.198	
11	Abridged Picture Vocabulary Test Score (PVT)	-0.005	0.003		-0.006	0.005	
12	Age	0.070	0.048		0.080	0.054	
13	Sports Participation	0.272	0.109	*	-0.244	0.167	
14	Missing Sports Participation	0.062	0.128		-0.252	0.199	
15	Latina/o	0.149	0.153		0.207	0.244	
16	African American	-0.279	0.201		-0.695	0.230	**
17	Asian American	0.128	0.263		0.203	0.269	
18	Other Race/Ethnicity	-0.426	0.229	+	-0.442	0.404	
19	White (Reference Group)	---	---		---	---	
20	Lives with Both Biological Parents	-0.070	0.101		-0.034	0.151	
21	Parents' Education Level	0.020	0.039		-0.024	0.058	
22	Ever Had Romantic Relationship	0.076	0.101		-0.221	0.126	+
23	Pubertal Development Slower than Peers	-0.116	0.153		-0.062	0.222	
24	Pubertal Development Faster than Peers	0.527	0.111	***	0.012	0.140	
25	Intercept	-0.149	0.055	**	-1.864	0.078	***
	School Level Variance (Tau)	0.060 ***			0.111 ***		
	N (Individuals)	3887			3793		
	N (Schools)	77			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

The findings from Table 2 (above) suggest that all students in the school serve as a salient reference group or target for social comparison that is associated with both boys' and girls' behaviors. Thus, in terms of weight-loss behaviors, I find support for my first hypothesis, that general others matter for adolescents' weight-loss behaviors.

Similar Others

Turning next to my hypothesis regarding similar others, I investigate the role of adolescents of a similar weight status, a highly visible characteristic, on adolescents' weight-loss behaviors. Table 3 (below) presents unstandardized Laplace coefficients from multi-level models predicting the effect of similar others on individual adolescents' weight-loss behaviors. To test my second hypothesis, I estimate cross-level interactions in order to determine whether or not adolescents' behaviors conform to the behaviors and characteristics of similar-weight same-sex peers in the school. The area highlighted in grey in Table 3 depicts the coefficients relevant to answering this hypothesis.

Once again the models reveal a startling similarity between adolescent boys and girls. Their weight-loss behaviors are both significantly associated with the behaviors and physical characteristics of similar-others. In order to understand the magnitude of the effects shown in Table 3, I calculated predicted probabilities of an adolescent trying to lose weight by their overweight status while varying the school context variables. Figure 1 (below) depicts these predicted probabilities for both boys and girls.

Table 3: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Weight-Loss Behaviors, WII: Investigating the Role of Similar Others in the School Context

		Girls						Boys					
		Model 1			Model 2			Model 3			Model 4		
Row	School-Level Variables	B	SE		B	SE		B	SE		B	SE	
1	Proportion of Overweight Same-Sex Peers	-1.061	0.535	+	---	---		-1.795	1.240		---	---	
2	Prop of Overweight Same-Sex Peers Trying to Lose Weight	0.594	0.309	+	---	---		0.780	0.491		---	---	
3	Prop of Underweight Same-Sex Peers	---	---		2.278	0.855	*	---	---		0.684	1.679	
4	Prop of Underweight Same-Sex Peers Trying to Lose Weight	---	---		0.389	0.594		---	---		4.393	1.555	**
5	Prop of Same-Sex African-American Peers	0.015	0.294		-0.088	0.269		0.418	0.336		0.207	0.359	
6	Large School	-0.010	0.110		-0.012	0.110		0.004	0.144		0.047	0.154	
	Cross-Level Interactions												
	Overweight BMI by												
7	Prop of Overweight Same-Sex Peers	-0.217	1.358		---	---		2.394	2.066		---	---	
8	Prop of Overweight Same-Sex Peers Trying to Lose Weight	2.068	0.866	*	---	---		1.679	0.842	*	---	---	
	Underweight BMI by												
9	Prop of Underweight Same-Sex Peers	---	---		5.728	2.840	*	---	---		6.261	5.104	
10	Prop of Underweight Same-Sex Peers Trying to Lose Weight	---	---		2.847	1.820		---	---		4.638	7.253	
	Individual-Level Variables												
11	Overweight BMI	1.403	0.121	***	1.406	0.124	***	1.868	0.122	***	1.930	0.104	***
12	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---		---	---		---	---	
13	Underweight BMI	-1.550	0.156	***	-1.795	0.173	***	-1.558	0.405	***	-1.687	0.449	***
14	Low Self-Esteem	0.568	0.122	***	0.577	0.122	***	0.392	0.229	+	0.395	0.232	+
15	Parents' Perceive Adolescent as Overweight	0.961	0.270	**	0.956	0.278	**	1.244	0.266	***	1.256	0.263	***
16	Missing Parents' Perception of Overweight	0.007	0.136		0.015	0.135		0.296	0.220		0.286	0.219	
17	Abridged Picture Vocabulary Test Score (PVT)	-0.005	0.004		-0.004	0.004		-0.006	0.006		-0.006	0.005	
18	Age	0.075	0.047		0.067	0.046		0.085	0.061		0.073	0.058	
19	Sports Participation	0.271	0.112	*	0.280	0.115	*	-0.250	0.166		-0.246	0.155	
20	Missing Sports Participation	0.081	0.133		0.056	0.132		-0.299	0.194		-0.261	0.183	
21	Latina/o	0.151	0.157		0.197	0.174		0.264	0.207		0.281	0.212	
22	African American	-0.276	0.209		-0.268	0.198		-0.664	0.228	**	-0.677	0.235	**
23	Asian American	0.129	0.264		0.168	0.277		0.203	0.307		0.198	0.313	
24	Other Race/Ethnicity	-0.395	0.228	+	-0.418	0.240	+	-0.449	0.418		-0.401	0.377	
25	White (Reference Group)	---	---		---	---		---	---		---	---	
26	Lives with Both Biological Parents	-0.065	0.103		-0.060	0.102		-0.041	0.161		-0.037	0.163	
27	Parents' Education Level	0.023	0.039		0.027	0.039		-0.033	0.059		-0.023	0.058	
28	Ever Had Romantic Relationship	0.076	0.102		0.079	0.106		-0.218	0.126	+	-0.216	0.135	
29	Pubertal Development Slower than Peers	-0.114	0.155		-0.122	0.170		-0.036	0.223		-0.040	0.226	
30	Pubertal Development Faster than Peers	0.531	0.113	***	0.526	0.116	***	0.030	0.146		0.016	0.154	
	Intercept	-0.133	0.057	*	-0.155	0.060	*	-1.831	0.081	***	-1.867	0.088	***
	School Level Variance (Tau)	0.085 ***			0.069 ***			0.161 ***			0.161 ***		
	N (Individuals)	3887			3887			3793			3793		
	N (Schools)	77			77			78			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Figure 2: Predicted Probabilities of Trying to Lose Weight for Adolescents Based on the Proportion of their Same-Sex Overweight Schoolmates that are Engaged in Weight-Loss Behaviors (Based on Table 3, Models 1 & 3)

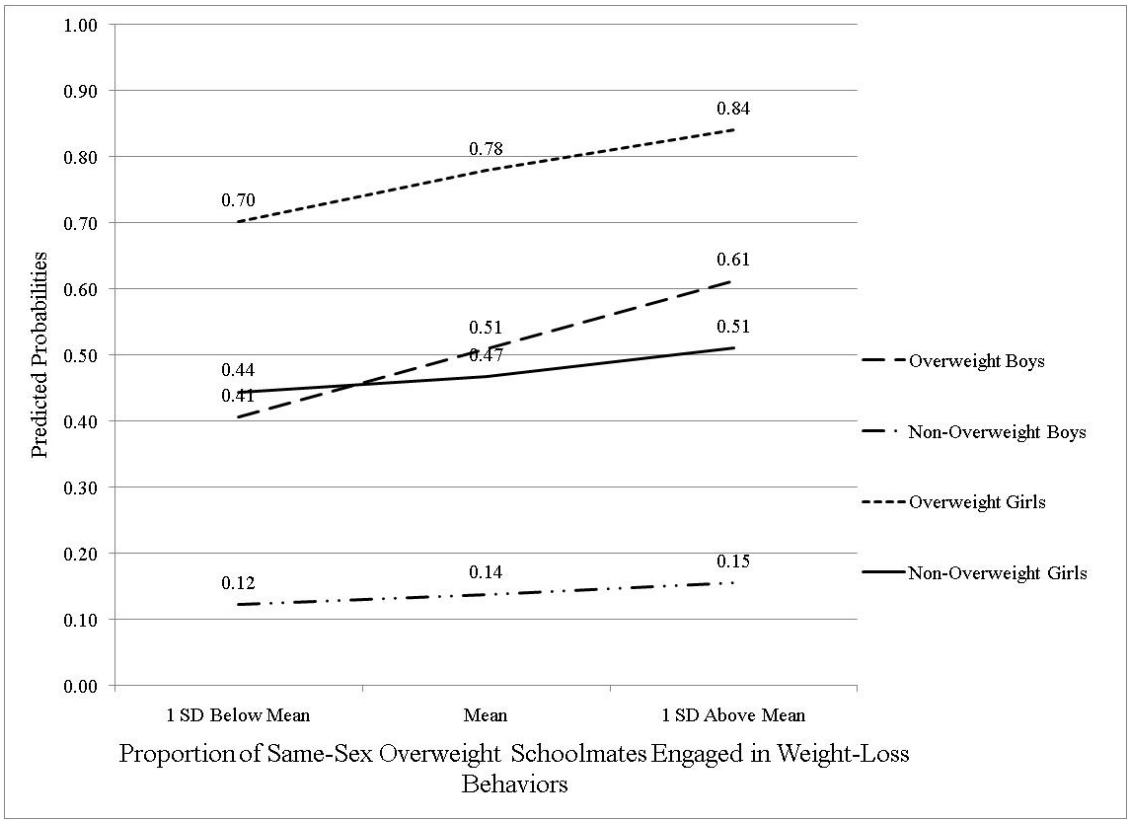


Figure 1 makes several patterns dramatically clear. First of all, overweight girls, regardless of the attributes of the school context, are significantly more likely to report trying to lose weight than girls who are not overweight. The probability that they report engaging in weight-loss behaviors is significantly increased when they attend schools where many overweight girls are trying to lose weight. Specifically, the predicted probability increased by six percentage points with a one standard deviation increase in the proportion of overweight girls who are trying to lose weight in the school. Overweight boys are also more likely than non-overweight boys to report trying to lose weight and, like girls, they are significantly more likely to report trying to lose weight when they attend a school where overweight boys are engaged in weight-loss behaviors.

Specifically, the predicted probability increased by ten percentage points with a one standard deviation increase in the proportion of overweight boys who are trying to lose weight in the school. It is also interesting to note that girls who are not overweight have, on average, a relatively high probability of trying to lose weight, regardless of the school context (in an average school, for an otherwise average non-overweight girl, the predicted probability is 0.47). This is consistent with prior research about the prevalence of unnecessary weight-loss behaviors among adolescent girls. The predicted probability that a non-overweight adolescent boy is trying to lose weight is much lower (in an average school, for an otherwise average boy, the predicted probability is 0.14). This is also consistent with prior research on boys' weight-control behaviors.

Because a fair number of underweight girls report trying to lose weight, I also estimated the effect of similar others for underweight girls. Though underweight girls are much less likely to report trying to lose weight than average weight or overweight girls, this changes when they are in contexts where being thin is very common among female schoolmates. Holding all other variables constant, underweight girls have a 0.12 predicted probability of trying to lose weight when they attend schools where 12% of their underweight female schoolmates are trying to lose weight (the mean in my sample). When the proportion of underweight female schoolmates who are trying to lose weight increases to 23% (one standard deviation above the mean), underweight girls have a 0.19 predicted probability of reporting trying to lose weight, holding all other variables constant. Fifteen schools (nearly 20% of my nationally-representative sample of schools) fall into this category (where 23% or more of the underweight student body is trying to lose weight). In these schools, we can expect that nearly one in five underweight adolescent girls will be unnecessarily trying to lose weight. Model 4 estimated the role of underweight similar others on underweight boys' weight-loss behaviors and found no

significant effects. This is likely because underweight adolescent boys almost never report trying to lose weight.

The findings from Table 3 (above) suggest that similar others, when similarity is based on the easily-observable attribute of body size, serve as a salient reference group or target for social comparison that is associated with both boys' and girls' weight-loss behaviors. This is consistent with prior research on similar others and girls' weight-loss behaviors (Mueller et al. 2010). Thus, in terms of weight-loss behaviors, I find support for my second hypothesis, that similar others matter for adolescents' weight-loss behaviors.

High Status Others

Next I turn to my final hypothesis related to adolescents' weight-loss behaviors. Given that social status is central to adolescent social life and social comparisons often are used to determine what traits or behaviors are valued in a social setting, I now investigate whether or not adolescents of a high social status serve as a salient target for social comparison for weight-loss behaviors. Table 4 presents unstandardized Laplace coefficients from multi-level models predicting the effect of high status others on individual adolescents' weight-loss behaviors. These models present evidence regarding my hypothesis that if social status guides adolescents' choices of social comparison targets, adolescents' behaviors will conform to the behaviors and characteristics of high-status same-sex peers in the school.

Table 4: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Weight-Loss Behaviors, WII: Investigating the Role of High Status Others in the School Context

		Girls						Boys					
		Model 1			Model 2			Model 3			Model 4		
Row	School-Level Variables	B	SE		B	SE		B	SE		B	SE	
1	Average BMI of High-Status Same-Sex Peers	-0.083	0.047	+	-0.113	0.044	*	-0.096	0.066		-0.088	0.070	
2	Prop of High-Status Same-Sex Peers Trying to Lose Weight	0.881	0.513	+	0.938	0.541		0.715	0.638		0.103	0.679	
3	Prop of Same-Sex African-American Peers	0.064	0.270		0.020	0.295		0.253	0.408		0.241	0.410	
4	Large School	0.064	0.114		0.048	0.102		0.094	0.149		0.093	0.148	
	Cross-Level Interactions												
	Overweight BMI by												
5	Average BMI of High-Status Same-Sex Peers	0.030	0.099		---	---		0.053	0.086		---	---	
6	Prop of High-Status Same-Sex Peers Trying to Lose Weight	-0.360	0.837		---	---		-1.002	1.146		---	---	
	Underweight BMI by												
7	Average BMI of High-Status Same-Sex	---	---		-0.303	0.232		---	---		-0.067	0.333	
8	Prop of High-Status Same-Sex Peers Trying to Lose Weight	---	---		0.537	1.965		---	---		-3.517	3.831	
	Individual-Level Variables												
9	Overweight BMI	1.402	0.123	***	1.392	0.123	***	1.952	0.097	***	1.945	0.094	***
10	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---					---	---	
11	Underweight BMI	-1.552	0.155	***	-1.632	0.182	***	-1.485	0.332	***	-1.525	0.355	***
12	Low Self-Esteem	0.628	0.100	***	0.566	0.122	***	0.395	0.222	+	0.387	0.218	+
13	Parents' Perceive Adolescent as Overweight	0.929	0.285	**	0.936	0.290	**	1.280	0.276	***	1.286	0.268	***
14	Missing Parents' Perception of Overweight	0.020	0.191		0.021	0.142		0.293	0.206		0.296	0.205	
15	Abridged Picture Vocabulary Test Score (PVT)	-0.005	0.004		-0.004	0.004		-0.006	0.005		-0.006	0.005	
16	Age	0.056	0.054		0.075	0.048		0.067	0.054		0.067	0.054	
17	Sports Participation	0.144	0.114		0.281	0.110	*	-0.258	0.153	+	-0.257	0.156	+
18	Missing Sports Participation	-0.053	0.123		0.063	0.129		-0.242	0.187		-0.243	0.191	
19	Latina/o	0.007	0.178		0.135	0.162		0.293	0.208		0.292	0.200	
20	African American	-0.302	0.138	*	-0.278	0.201		-0.653	0.257	*	-0.651	0.254	*
21	Asian American	0.038	0.236		0.088	0.286		0.244	0.312		0.243	0.303	
22	Other Race/Ethnicity	-0.198	0.329		-0.448	0.238	+	-0.363	0.377		-0.376	0.387	
23	White (Reference Group)	---	---		---	---		---	---		---	---	
24	Lives with Both Biological Parents	-0.031	0.094		-0.070	0.106		-0.023	0.164		-0.023	0.162	
25	Parents' Education Level	0.010	0.054		0.030	0.040		-0.032	0.058		-0.032	0.056	
26	Pubertal Development Slower than Peers	-0.141	0.114		-0.114	0.153		-0.002	0.214		-0.001	0.207	
27	Pubertal Development Faster than Peers	0.486	0.087	***	0.542	0.119	***	0.002	0.150		0.002	0.148	
28	Intercept	-0.140	0.058	*	-0.154	0.062	*	-1.830	0.078	***	-1.834	0.080	***
	School Level Variance (Tau)	0.073 ***			0.072 ***			0.216 ***			0.218 ***		
	N (Individuals)	3890			3890			3806			3806		
	N (Schools)	77			77			78			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Interestingly, as is evident in Table 4 (above), Models 1-4, for both boys and girls, adolescents do not appear to reference either the behaviors or physical appearance of high status same-sex peers when engaging in social comparisons in the school context in order to determine whether to engage in weight-loss behaviors. These findings suggest that high-status others do not serve as a salient reference group or target for social comparison. There is no significant association between the behaviors or average BMI of high-status same-sex peers and the likelihood that an individual adolescent (boy or girl) will engage in weight-loss behaviors. This pattern holds whether the adolescent is underweight or overweight. Thus, in terms of weight-loss behaviors, I do not find support for my third hypothesis, that high status others matter for adolescents' weight-loss behaviors.

DISCUSSION

The majority of adolescents report being aware of gendered body ideals (Milkie 1999; Nichter 2000); however, how youth incorporate 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 chapter, I add to this growing literature, first, by analyzing how the school serves as an important context where adolescents learn weight-loss behaviors, and second, by investigating the social comparison pathways that connect adolescents' individual behaviors to the characteristics and behaviors of their schoolmates. Specifically, I tested who within the school would serve as a salient target for social comparison focusing on general others, similar others, and high-status others.

My most important findings were that both general and similar others are influential reference groups within the school context for both boys and girls. The weight-loss behaviors of overweight boys and girls are most associated with the prevalence of weight-loss behavior among overweight same-sex peers in their schools. The same is true for underweight girls. The more underweight girls there are that are trying to lose weight the more likely it is that an individual underweight girl in that school is to be trying to lose weight.

What these findings suggest is that comparisons with similar others (in this case, same-sex schoolmates of a similar body size) appear to be powerful in terms of influencing behavior (in this case, individual adolescents' weight-loss behaviors). I did not find the behavior of high status adolescents to be associated with individuals' behaviors. This suggests that similarity and exposure to general others may be the mechanisms through which body ideals are communicated in high schools as a whole.

In addition to my main conclusions from my formal hypotheses, there are other aspects of my 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.

Overall, my findings suggest that social contexts in schools play an important role in shaping adolescents' decisions to practice weight control. How widespread gendered body ideals affect adolescents depends in part on the weight-related culture they experience in the primary social context of their daily lives: their schools.

Chapter 5: Social Comparisons, the School Context, and Self-Perception of Weight

Having established that the school context is associated with adolescents' weight-loss behaviors, and that general and similar others are effective pathways through which adolescents appear to learn the body ideals present in their school, I now examine the role of schools and social comparison in adolescents' self-perception of weight. Self-perception of weight is known to be a construct that is partially based on objective knowledge of overweight, but it is also influenced by adolescents' subjective experiences of what is overweight. In other words, individuals differ in their experience of, and definitions of, overweight. This is particularly evident in the percent of adolescents, particularly girls, who misperceive their weights. With this chapter, I investigate whether the school context and the social relationships with peers that occur there serves as a location for the social construction of "overweight". As with my previous analytic chapter, I analyze the role of general others, similar others and high status others, as I investigate the circumstances associated with adolescents perceiving their bodies as overweight.

General Others

Table 5 (below) presents Laplace coefficients from multi-level models predicting overweight self-perception among adolescent boys and girls. It investigates my hypothesis concerning the role of general others. Interestingly, boys and girls are not as similar in terms of the role the school context plays in the construction of their overweight self-perception as they were with weight-loss behaviors. For adolescent girls, there is no significant association between the proportion of overweight girls in the school and the likelihood that they will perceive their bodies as overweight (Table 5,

Model 1, Row 1). The same is true of the prevalence of weight-loss behavior in the school; the proportion of girls in the school engaged in trying to lose weight is not associated with individual girls' likelihood of seeing their weight as overweight (Table 5, Model 1, Row 2). Even when entered one at a time into the model, these results remain insignificant and the coefficients do not change in magnitude. There is, however, a positive association between the proportion of girls in the school who misperceive their healthy weight as overweight and the likelihood that an individual girl in that school perceives herself as overweight, net of all other variables (Table 5, Model 2, Row 3). Specifically, holding all other variables constant, girls have a 0.39 predicted probability of perceiving themselves as overweight when they attend schools where 24% of the female student body misperceives their weight as overweight (the mean value in my sample). With a one standard deviation increase in the proportion of girls in the school who misperceive a healthy weight as overweight (to 29%), girls have a 0.43 predicted probability of perceiving themselves as overweight, net of their actual weight and all other variables. In schools where misperception is less common (specifically, one standard deviation below the mean or 19%), girls have a 0.35 predicted probability of perceiving themselves as overweight, holding all other variables constant.

Table 5: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Overweight Self-Perception, WII: Investigating the Role of General Others in the School Context

		Girls						Boys					
		Model 1			Model 2			Model 3			Model 4		
Row	School-Level Variables	B	SE		B	SE		B	SE		B	SE	
1	Proportion of Overweight Same-Sex Peers	-0.959	0.841		---	---		-3.019	1.120	**	---	---	
2	Proportion of Same-Sex Peers Trying to Lose Weight	0.569	0.761		---	---		4.661	1.757	*	---	---	
3	Proportion of Same-Sex Peers who Misperceive a Healthy Weight as Overweight	---	---		2.189	0.961	*	---	---		1.355	1.111	
4	Prop of Same-Sex African-American Peers	0.139	0.306		0.251	0.302		0.024	0.394		-0.255	0.411	
5	Large School	-0.196	0.103	+	-0.167	0.106		-0.060	0.148		0.064	0.175	
	Individual-Level Variables												
6	Overweight BMI	2.069	0.128	***	2.073	0.130	***	2.646	0.140	***	2.636	0.137	***
7	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---		---	---		---	---	
8	Underweight BMI	-2.180	0.258	***	-2.183	0.258	***	-2.208	0.548	***	-2.211	0.538	***
9	Low Self-Esteem	0.682	0.123	***	0.674	0.122	***	0.710	0.244	**	0.707	0.251	**
10	Parents' Perceive Adolescent as Overweight	1.997	0.441	***	1.986	0.443	***	2.291	0.320	***	2.282	0.323	***
11	Missing Parents' Perception of Overweight	0.182	0.187		0.175	0.177		0.144	0.261		0.133	0.254	
12	Abridged Picture Vocabulary Test Score (PVT)	0.004	0.004		0.004	0.004		0.008	0.005	+	0.009	0.005	+
13	Age	0.156	0.053	**	0.155	0.049	**	0.082	0.070		0.087	0.072	
14	Sports Participation	-0.099	0.142		-0.108	0.137		-0.575	0.191	**	-0.572	0.198	**
15	Missing Sports Participation	0.080	0.148		0.095	0.144		-0.437	0.203	*	-0.429	0.205	*
16	Latina/o	0.145	0.164		0.190	0.163		-0.021	0.239		0.010	0.256	
17	African American	-0.320	0.177	+	-0.303	0.173	+	-0.756	0.264	**	-0.747	0.256	**
18	Asian American	0.318	0.304		0.341	0.280		0.366	0.242		0.322	0.269	
19	Other Race/Ethnicity	0.085	0.254		0.079	0.260		-0.525	0.486		-0.510	0.499	
20	White (Reference Group)	---	---		---	---		---	---		---	---	
21	Lives with Both Biological Parents	-0.086	0.097		-0.085	0.099		-0.058	0.138		-0.051	0.143	
22	Parents' Education Level	0.006	0.047		0.007	0.046		0.011	0.055		0.002	0.053	
23	Ever Had Romantic Relationship	-0.037	0.131		-0.038	0.134		-0.366	0.131	**	-0.372	0.132	**
24	Pubertal Development Slower than Peers	0.005	0.212		0.010	0.214		0.141	0.202		0.141	0.206	
25	Pubertal Development Faster than Peers	0.677	0.138	***	0.680	0.131	***	0.103	0.151		0.101	0.155	
	Intercept	-0.442	0.063	***	-0.450	0.062	***	-1.997	0.125	***	-2.009	0.127	***
	School Level Variance (Tau)	0.109 ***			0.094 ***			0.172 ***			0.251 ***		
	N (Individuals)	3886			3886			3793			3793		
	N (Schools)	77			77			78			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Boys' overweight self-perception appears to be associated with more aspects of the school context than girls' self-perception. Boys' overweight self-perception is associated with the proportion of overweight boys in the school: with a one standard deviation increase in the proportion of overweight boys in the school, an individual boy, on average, experiences a 2 percentage point decrease in the predicted probability of perceiving his weight is overweight, net of his BMI status and all other variables (Table 5, Model 3, Row 1). Specifically, the predicted probability decreases from 0.14 (in schools with below average proportions of overweight boys – 0.21), to 0.12 (in schools with average proportions of overweight boys – 0.28), to 0.10 (in schools with above average proportions of overweight boys – 0.35). On the other hand, if many of a boy's male peers are trying to lose weight, an otherwise average adolescent boy is significantly more likely to report his weight is overweight. Specifically, with a one standard deviation increase in the proportion of adolescent boys trying to lose weight in the school, an individual boy, on average, experiences a 3 percentage point increase in the predicted probability that he reports his weight as overweight, net of all other variables (Table 5, Model 3, Row 2). Boys who attend schools with an average percent of same-sex peers who are trying to lose weight (19%) have a 0.12 predicted probability of perceiving their weight as overweight. Interestingly, unlike girls, boys' overweight self-perception is not associated with the prevalence of overweight *misperception* among boys in the school.

Overall, these findings do suggest that the definition of overweight is negotiated in the school context, perhaps particularly for adolescent boys. They also suggest that exposure to general others within the school context shape adolescents' weight perception, once again, particularly for adolescent boys.

SIMILAR OTHERS

Next I return to investigating the role that similar others play in adolescents' overweight self-perception. Following my hypothesis regarding similar others, I investigate the role of adolescents of a similar weight status, a highly visible characteristic, on adolescents' overweight self-perception. Table 6 (below) presents unstandardized Laplace coefficients from multi-level models predicting the effect of similar others on adolescents' overweight self-perception. To test this hypothesis, I estimate cross-level interactions in order to determine whether or not adolescents' self-perception conforms to the perceptions and characteristics of similar-weight same-sex peers in the school. The area highlighted in grey in Table 6 (below) depicts the coefficients relevant to answering this hypothesis.

As is apparent in Models 1 and 2, Rows 7-10, the perceptions and weight attributes of similar others are not associated with the self-perceptions of adolescent girls; however, the story is quite different for adolescent boys. The self-perception of overweight of adolescent boys is associated with the attributes of their same-weight status same-sex schoolmates (Model 3). Figure 2 (below) depicts the relationship between the proportion of overweight boys in the school for overweight and non-overweight boys. As was apparent in Table 5, boys who are not overweight are not likely to perceive their bodies as overweight. Interestingly, in a school where overweight is more common among boys, they are even less likely to do so. On average, with a one standard deviation increase in the proportion of overweight boys in the school, the predicted probability that a non-overweight boy in that school sees himself as overweight decreases by almost 2 percentage points. Though the magnitude of this difference is not substantial, it is statistically significant.

Table 6: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Overweight Self-Perception, WII: Investigating the Role of Similar Others in the School Context

		Girls						Boys					
		Model 1			Model 2			Model 3			Model 4		
Row	School-Level Variables	B	SE		B	SE		B	SE		B	SE	
1	Proportion of Overweight Same-Sex Peers	-0.726	0.808		---	---		-2.207	1.022	*	---	---	
2	Prop of Overweight Same-Sex Peers Who Perceive Themselves as Overweight	0.167	0.462		---	---		0.493	0.732		---	---	
3	Prop of Underweight Same-Sex Peers	---	---		0.654	1.017		---	---		2.232	2.076	
4	Prop of Underweight Same-Sex Peers Who Perceive Themselves as Overweight	---	---		0.846	1.151		---	---		-2.366	39.529	
5	Prop of Same-Sex African-American Peers	0.110	0.308		-0.020	0.276		0.148	0.441		-0.279	0.411	
6	Large School	-0.192	0.105	+	-0.187	0.102		0.096	0.162		0.071	0.193	
	Cross-Level Interactions												
	Overweight BMI by												
7	Prop of Overweight Same-Sex Peers	-0.608	1.648		---	---		4.625	2.272	*	---	---	
8	Prop of Overweight Same-Sex Peers Who Perceive Themselves as Overweight	1.589	1.040		---	---		2.321	1.040	*	---	---	
	Underweight BMI by												
9	Prop of Underweight Same-Sex Peers	---	---		3.071	6.277		---	---		7.451	6.854	
10	Prop of Underweight Same-Sex Peers Who Perceive Themselves as Overweight	---	---		4.460	3.306		---	---		-17.589	298.04	
	Key Individual-Level Variables												
11	Overweight BMI	2.138	0.155	***	2.052	0.137	***	2.584	0.170	***	2.638	0.146	***
12	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---		---	---		---	---	
13	Underweight BMI	-2.178	0.266	***	-2.309	0.283	***	-2.225	0.569	***	-2.540	3.595	
14	Low Self-Esteem	0.678	0.118	***	0.681	0.122	***	0.699	0.249	**	0.705	0.279	*
15	Parents' Perceive Adolescent as Overweight	1.990	0.433	***	2.004	0.456	***	2.297	0.325	***	2.285	0.325	***
16	Missing Parents' Perception of Overweight	0.182	0.187		0.187	0.177		0.122	0.261		0.140	0.264	
17	Abridged Picture Vocabulary Test Score (PVT)	0.003	0.004		0.005	0.004		0.008	0.005		0.009	0.006	
18	Age	0.157	0.052	**	0.155	0.052	**	0.080	0.072		0.087	0.072	
19	Sports Participation	-0.102	0.145		-0.095	0.131		-0.569	0.201	**	-0.571	0.203	**
20	Missing Sports Participation	0.082	0.141		0.091	0.143		-0.437	0.219	*	-0.434	0.213	*
21	Latina/o	0.153	0.166		0.166	0.164		0.061	0.234		0.064	0.231	
22	African American	-0.328	0.178	+	-0.310	0.175	+	-0.721	0.274	**	-0.724	0.262	**
23	Asian American	0.326	0.327		0.334	0.314		0.397	0.252		0.360	0.287	
24	Other Race/Ethnicity	0.090	0.256		0.080	0.267		-0.514	0.525		-0.480	0.508	
25	White (Reference Group)	---	---		---	---		---	---		---	---	
26	Lives with Both Biological Parents	-0.080	0.097		-0.080	0.099		-0.068	0.149		-0.050	0.146	
27	Parents' Education Level	0.007	0.047		0.015	0.047		-0.006	0.056		0.008	0.062	
28	Ever Had Romantic Relationship	-0.031	0.143		-0.036	0.135		-0.362	0.136	**	-0.368	0.137	**
29	Pubertal Development Slower than Peers	0.010	0.222		0.000	0.207		0.159	0.201		0.147	0.200	
30	Pubertal Development Faster than Peers	0.687	0.139	***	0.678	0.143	***	0.103	0.153		0.100	0.153	
	Intercept	-0.419	0.074	***	-0.453	0.069	***	-1.985	0.120	***	-2.029	0.494	***
	School Level Variance (Tau)	0.112 ***			0.110 ***			0.183 ***			0.252 ***		
	N (Individuals)	3886			3886			3793			3793		
	N (Schools)	77			77			78			78		

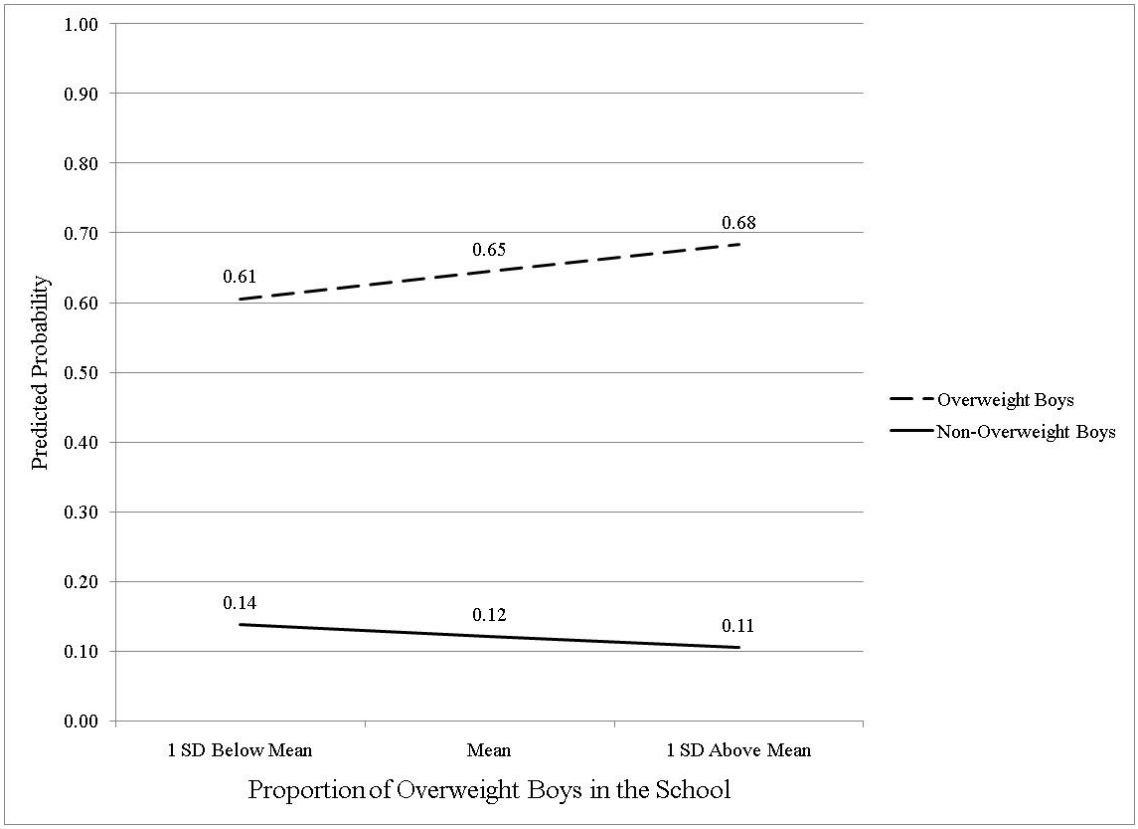
*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Overweight boys show the opposite pattern (also depicted in Figure 2, below). On average, overweight boys are more likely to perceive their overweight status as overweight when they attend schools with more overweight boys, net of all other

variables. Specifically, the predicted probability that an overweight boy perceives his overweight status accurately increases by approximately four percentage points with a one standard deviation increase in the proportion of overweight boys in the school. This is interesting. Instead of the increasing prevalence of overweight boys also increasing the local definition of what is an overweight body, boys may become more aware of overweight when surrounded by other overweight boys. This may be because these are the conditions under which a culture of weight loss forms in male adolescent society.

Figure 3: Predicted Probabilities of Overweight Self-Perception for Adolescent Boys Based on the Proportion of Overweight Boys in the School (Based on Table 6, Model 3)



Model 3, Row 6 helps me evaluate if it is also the values that overweight boys bring into the school context that affect overweight adolescent boys' likelihood of accurate overweight self-perception. I find evidence to support this idea. The proportion of overweight boys that perceive themselves as overweight has no direct impact on all boys in the school (Model 3, Row 2, the coefficient is not statistically significant), but it does increase the likelihood that overweight boys in that school will perceive their overweight status accurately. On average, with a one standard deviation increase in the proportion of overweight boys who perceive their weight as overweight in the school, the predicted probability that an individual overweight boy in that school increases by approximately 8 percentage points. In other words, the more overweight boys who perceive their weight accurately in a school, the more likely it is that an individual overweight boy in that school also has an accurate weight perception.

As was found in previous models, there is no significant association between the characteristics of underweight boys and the likelihood that an underweight boy will misperceive his weight as underweight (Table 6, Model 4). This is likely due to how rare it is for an underweight boy to perceive his low BMI as overweight.

High Status Others

Next I turn to my final hypothesis related to adolescents' self-perception of overweight: whether or not adolescents of a high social status serve as a salient target for social comparison for weight. Table 7 presents unstandardized Laplace coefficients from multi-level models predicting the effect of high status others on individual adolescents' self-perception of weight. These models test whether social status guides adolescents' choices of social comparison targets.

Table 7: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Overweight Self-Perception, WII: Investigating the Role of High Status Others in the School Context

		Girls						Boys					
		Model 1			Model 2			Model 3			Model 4		
Row	School-Level Variables	B	SE		B	SE		B	SE		B	SE	
1	Average BMI of High-Status Same-Sex Peers	-0.016	0.065		0.002	0.050		-0.132	0.080		-0.093	0.173	
2	Prop of High-Status Same-Sex Peers Who Perceive Themselves as Overweight	0.735	0.505		0.855	0.499	+	1.234	0.928		1.116	1.273	
3	Prop of Same-Sex African-American Peers	-0.097	0.346		-0.302	0.346		-0.172	0.415		-0.155	0.430	
4	Large School	-0.162	0.109		-0.119	0.131		0.059	0.176		0.051	0.182	
	Cross-Level Interactions												
	Overweight BMI by												
5	Average BMI of High-Status Same-Sex Peers	0.060	0.123		---	---		0.122	0.121		---	---	
6	Prop of High-Status Same-Sex Peers Who Perceive Themselves as Overweight	-1.936	1.362		---	---		-1.380	1.415		---	---	
	Underweight BMI by												
7	Average BMI of High-Status Same-Sex Peers	---	---		-0.051	0.167		---	---		-0.034	1.445	
8	Prop of High-Status Same-Sex Peers Who Perceive Themselves as Overweight	---	---		-0.278	1.779		---	---		2.826	13.207	
	Individual-Level Variables												
9	Overweight BMI	2.050	0.130	***	2.219	0.187	***	2.656	0.141	***	2.633	0.146	***
10	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---		---	---		---	---	
11	Underweight BMI	-2.186	0.261	***	-2.075	0.240	***	-2.225	0.537	***	-2.335	1.097	*
12	Low Self-Esteem	0.679	0.127	***	0.673	0.128	***	0.717	0.252	**	0.709	0.279	*
13	Parents' Perceive Adolescent as Overweight	1.993	0.450	***	2.298	0.336	***	2.281	0.322	***	2.288	0.328	***
14	Missing Parents' Perception of Overweight	0.202	0.182		0.237	0.160		0.138	0.259		0.140	0.261	
15	Abridged Picture Vocabulary Test Score (PVT)	0.005	0.005		0.001	0.003		0.008	0.005		0.008	0.005	
16	Age	0.155	0.050	**	0.118	0.057	*	0.088	0.073		0.088	0.075	
17	Sports Participation	-0.094	0.138		-0.130	0.123		-0.569	0.201	**	-0.567	0.203	**
18	Missing Sports Participation	0.088	0.144		0.042	0.172		-0.426	0.212	*	-0.428	0.213	*
19	Latina/o	0.172	0.163		0.024	0.193		0.014	0.246		0.021	0.243	
20	African American	-0.297	0.191		-0.224	0.234		-0.748	0.266	**	-0.748	0.269	**
21	Asian American	0.331	0.294		0.428	0.258	+	0.287	0.301		0.304	0.306	
22	Other Race/Ethnicity	0.070	0.259		0.236	0.352		-0.496	0.508		-0.491	0.493	
23	White (Reference Group)	---	---		---	---		---	---		---	---	
24	Lives with Both Biological Parents	-0.073	0.100		0.032	0.130		-0.055	0.143		-0.053	0.144	
25	Parents' Education Level	0.019	0.048		-0.023	0.045		0.002	0.054		0.002	0.061	
26	Ever Had Romantic Relationship	-0.042	0.136		-0.132	0.133		-0.371	0.132	**	-0.367	0.132	**
27	Pubertal Development Slower than Peers	0.010	0.218		-0.141	0.118		0.143	0.209		0.148	0.213	
28	Pubertal Development Faster than Peers	0.682	0.136	***	0.709	0.086	***	0.104	0.159		0.104	0.156	
	Intercept	-0.432	0.063	***	-0.369	0.076	***	-2.015	0.127	***	-2.013	0.179	***
	School Level Variance (Tau)	0.107 ***			0.100 ***			0.214 ***			0.213 ***		
	N (Individuals)	3886			3886			3793			3793		
	N (Schools)	77			77			78			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Interestingly, as is evident in Models 1 & 2 (above), for both boys and girls, adolescents once again do not appear to reference high status same-sex peers when engaging in social comparisons in the school context in order to determine how to perceive their weight.

Discussion

This analytic chapter provides further evidence that the school context matters to adolescents' body weight. How adolescents perceive their bodies is in part dependent on the peers that surround them in the primary context of their daily life: their school. Interestingly, this appears to be particularly true for adolescent boys. This may be because adolescent girls face more macro-level forces emphasizing being thin or that girls' self-perceptions are determined in the family or earlier in the life course. Boys' self-perception may be more prone to interpretation over their development based on values encountered in social contexts as they move through adolescence. The duality in the macro-level body ideals of boys – avoiding being overweight but also avoiding being too thin, both in favor of muscular athletic bodies – may render them more susceptible to local ideals.

What is interesting about my findings from this chapter is that they provide further support for my conclusions drawn in Chapter 5. Similar others appear to matter to adolescents' decisions about acceptable weight and what defines overweight. General others, representing the school's weight culture as a whole, also appear to affect adolescents' experiences with their bodies during adolescence. The primary difference is that girls' self-perception does not seem to be as shaped by the school context as their weight-control behaviors are. Perhaps this is because self-perception is a more intimate, internalized aspect of self, while behaviors are sometimes used as a tool to fit in. Boys'

self-perception, on the other hand, shows a different pattern. Like boys' weight-control behaviors, their self-perception is associated with the weight cultures encountered in the school context.

Chapter 6: Social Comparisons, the School Context, & Global Self-Esteem

Having established in Chapters 4 and 5 that the school context does play a role for both boys and girls in their weight-loss behaviors and overweight self-perception, I now turn to examining whether or not these experiences have consequences for adolescents' global self-esteem, an important aspect of their psychological functioning (Crocker and Major 1989; Wylie 1979). Research has shown that being overweight or having an overweight self-perception is sometimes, but not always, linked to lower self-esteem among adolescents (Ge et al. 2001; Swallen, Reither, Haas, and Meier 2005; Perrin, Boone-Heinonen, Field, Coyne-Beasley, and Gordon-Larsen 2010). With this chapter, I investigate the role of the school as a social context that can exacerbate or protect adolescents from macro-level values that stigmatize overweight or emphasize thinness norms. First, I explore whether exposure to the values and attributes of general others – in other words the culture of weight in the school – has a direct effect on adolescents global self-esteem. Second, I investigate the role of similar others; however, this time, I allow adolescents to self-define similarity by basing similarity on adolescents' self-perception of overweight (instead of their actual overweight status). Third, I investigate the culture of weight in the school as it is defined by high-status peers in the school.

General Others

Table 8 (below) presents unstandardized Laplace coefficients from multi-level models predicting low self-esteem among adolescent boys and girls. Unlike the effect of the behaviors and attributes of general others that I found in Chapters 4 and 5, I find no significant effect of the physical attributes (the proportion of overweight same-sex peers) or the weight-control behaviors of general others (Table 8, Models 1 and 2 below).

Table 8: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Low Self-Esteem, WII: Investigating the Role of General Others in the School Context

		Girls			Boys		
		Model 1			Model 2		
Row	School-Level Variables	B	SE		B	SE	
1	Proportion of Overweight Same-Sex Peers	0.690	0.895		-0.677	1.550	
2	Proportion of Same-Sex Peers Trying to Lose Weight	-0.768	1.157		1.497	1.920	
3	Prop of Same-Sex African-American Peers	-1.248	0.457	**	-0.237	0.436	
4	Large School	-0.042	0.172		0.014	0.191	
	Individual-Level Variables						
5	Overweight BMI	-0.204	0.155		-0.398	0.215	+
6	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---	
7	Underweight BMI	0.185	0.172		0.269	0.186	
8	Overweight Self-Perception	0.818	0.106	***	0.799	0.225	**
9	Parents' Perceive Adolescent as Overweight	0.308	0.252		0.324	0.348	
10	Missing Parents' Perception of Overweight	0.283	0.193		0.292	0.230	
11	Abridged Picture Vocabulary Test Score (PVT)	-0.009	0.004	*	0.010	0.005	*
12	Age	-0.154	0.063	*	0.131	0.068	+
13	Sports Participation	-0.365	0.142	*	-0.397	0.219	+
14	Missing Sports Participation	0.016	0.172		-0.184	0.186	
15	Latina/o	0.256	0.193		0.498	0.236	*
16	African American	-0.316	0.225		-0.110	0.266	
17	Asian American	0.382	0.239		0.686	0.338	*
18	Other Race/Ethnicity	0.484	0.264	+	0.237	0.397	
19	White (Reference Group)						
20	Lives with Both Biological Parents	-0.249	0.139	+	-0.131	0.159	
21	Parents' Education Level	-0.056	0.064		-0.053	0.065	
22	Ever Had Romantic Relationship	0.171	0.135		-0.130	0.140	
23	Pubertal Development Slower than Peers	0.064	0.153		0.245	0.182	
24	Pubertal Development Faster than Peers	-0.113	0.145		-0.075	0.178	
	Intercept	-1.687	0.069	***	-2.259	0.095	***
	School Level Variance (Tau)	0.070 **			0.055 *		
	N (Individuals)	3894			3792		
	N (Schools)	77			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

This pattern held for both boys and girls. This suggests that the overall weight-related culture of the school is not inherently related to an individual's self-esteem. Next, I examine whether there are circumstances under which the behaviors or attributes of schoolmates are salient to adolescent self-esteem.

SIMILAR OTHERS

Table 9 (below) presents unstandardized Laplace coefficients investigating the impact of similar others on adolescents' global self-esteem. For adolescent girls, a definite pattern appears (Table 9, Model 1, Row 5). First, it is worth noting that adolescent girls who perceive themselves as overweight are significantly more likely, on average, to report low self-esteem at Wave II than their counterparts who do not perceive themselves as overweight, net of all other variables (Table 9, Model 1, Row 10). Interestingly, being overweight is not significantly associated with low self-esteem, net of self-perception of overweight (Row 7). The negative association between overweight self-perception and low self-esteem is attenuated when girls attend schools where there is a higher proportion of overweight girls in the student body (Table 9, Model 1, Row 5). Figure 3 (below) depicts this relationship. First, it is important to note that the proportion of overweight girls in the school has no significant effect on girls' likelihood of experiencing low self-esteem if they do not have an overweight self-perception (Table 9, Model 1, Row 1). Though there is a slight upward trend depicted in Figure 3, it is not statistically significant. For girls who perceive their weight as overweight, the effect of the school is significant. Holding all other variables constant, girls have a 0.30 predicted probability of low self-esteem in a school where 23% of the female student body is overweight (the mean value). The predicted probability of low self-esteem decreases as the proportion of overweight girls in the school increases. Specifically, net of all other

variables, girls have a 0.26 predicted probability of low self-esteem in schools where 33% of the female student body is overweight (one standard deviation above the mean). Similarly, the predicted probability of low self-esteem increases for girls in schools with below average percentages of overweight girls. Girls have a 0.34 predicted probability of low self-esteem when they attend a school where only 13% of the female student body is overweight (one standard deviation below the sample mean). Interestingly, the same pattern is not found among adolescent boys, though it is also worth noting that adolescent boys with overweight self-perception are at significantly higher risk for low self-esteem than boys who do not perceive their bodies as overweight.

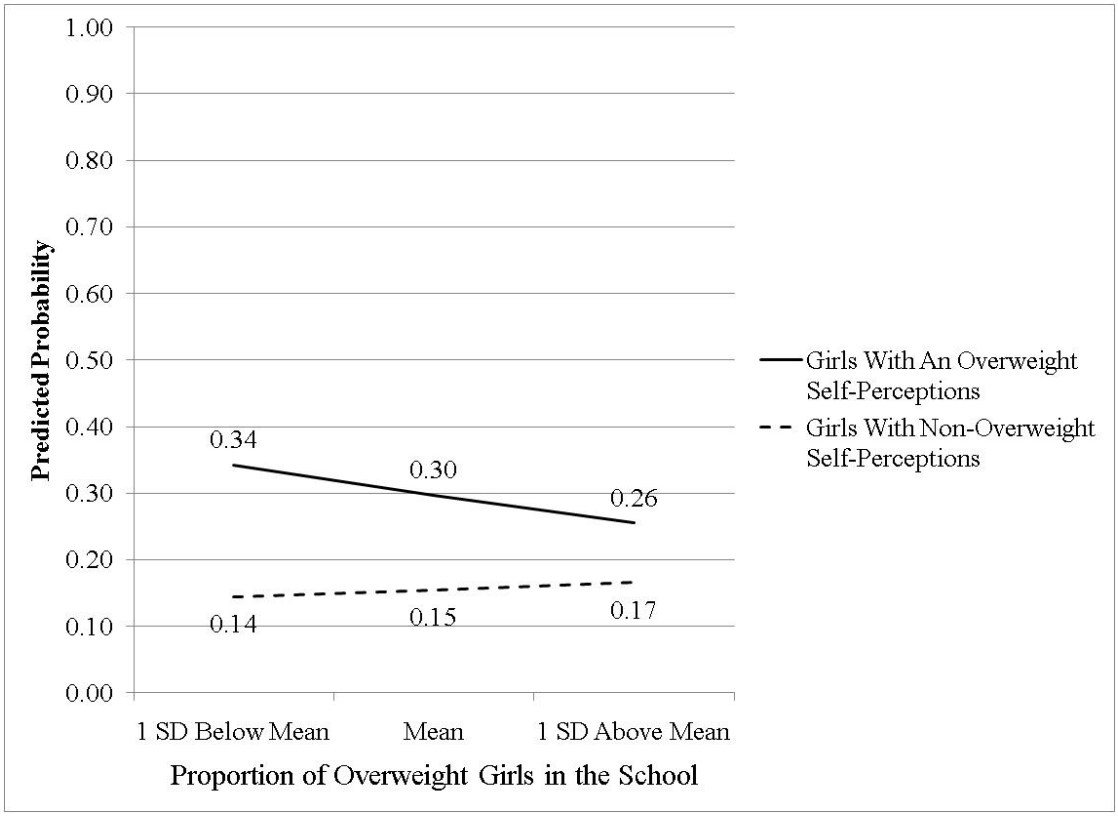
Table 9: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Low Self-Esteem, WII: Investigating the Role of Similar Others in the School Context

		Girls			Boys		
		Model 1			Model 2		
Row	School-Level Variables	B	SE		B	SE	
1	Proportion of Overweight Same-Sex Peers	0.799	0.945		-0.218	1.622	
2	Prop of Overweight Same-Sex Peers Trying to Lose Weight	-0.718	0.509		0.584	0.646	
3	Prop of Same-Sex African-American Peers	-1.213	0.414	**	-0.240	0.427	
4	Large School	-0.027	0.187		-0.007	0.193	
	Cross-Level Interactions						
	Overweight Self-Perception by						
5	Prop of Overweight Same-Sex Peers	-2.899	1.172	*	0.882	2.561	
6	Prop of Overweight Same-Sex Peers Trying to Lose Weight	1.141	0.818		0.368	1.049	
	Individual-Level Variables						
7	Overweight BMI	-0.174	0.155		-0.407	0.219	+
8	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---	
9	Underweight BMI	0.200	0.170		0.269	0.193	
10	Overweight Self-Perception	0.781	0.116	***	0.785	0.223	**
11	Parents' Perceive Adolescent as Overweight	0.313	0.267		0.306	0.361	
12	Missing Parents' Perception of Overweight	0.274	0.200		0.299	0.245	
13	Abridged Picture Vocabulary Test Score (PVT)	-0.009	0.004	*	0.011	0.005	*
14	Age	-0.157	0.065	*	0.132	0.068	+
15	Sports Participation	-0.363	0.147	*	-0.402	0.222	+
16	Missing Sports Participation	0.022	0.173		-0.208	0.198	
17	Latina/o	0.260	0.190		0.513	0.242	*
18	African American	-0.319	0.213		-0.100	0.274	
19	Asian American	0.399	0.247		0.693	0.324	*
20	Other Race/Ethnicity	0.500	0.283	+	0.226	0.399	
21	White (Reference Group)	---	---		---	---	
22	Lives with Both Biological Parents	-0.239	0.143	+	-0.133	0.168	
23	Parents' Education Level	-0.056	0.064		-0.053	0.067	
24	Ever Had Romantic Relationship	0.187	0.136		-0.130	0.143	
25	Pubertal Development Slower than Peers	0.059	0.159		0.246	0.190	
26	Pubertal Development Faster than Peers	-0.113	0.151		-0.076	0.179	
	Intercept	-1.687	0.075	***	-2.258	0.099	***
	School Level Variance (Tau)	0.078 **			0.059 **		
	N (Individuals)	3894			3792		
	N (Schools)	77			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Figure 4: Predicted Probabilities of Low Self-Esteem for Adolescent Girls Based on the Proportion of Overweight Girls in the School (Based on Table 9, Model 1)



HIGH STATUS OTHERS

As a final step, I consider whether the BMI of high status same-sex peers affects the self-esteem of adolescents. Interestingly, I once again find no effect of high status peers on adolescents (see Table 10 below). Though I fail to find direct effects on self-esteem of the behaviors and attributes of high status and general others, would I find an impact of general others and high status others if I investigated their impact on a group of adolescent girls who are already vulnerable for low self-esteem and the values present in the school context based on their evaluation of their own weight? In other words, do girls with an overweight self-perception respond to general others and high status others, in addition to similar others? To investigate this, I turn to the models presented in Table 11.

Table 10: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Low Self-Esteem, WII: Investigating the Role of High Status Others in the School Context

		Girls			Boys		
		Model 1			Model 2		
Row	School-Level Variables	B	SE		B	SE	
1	Average BMI of High Status Same-Sex Peers	0.101	0.080		-0.004	0.057	
2	Prop of Same-Sex African-American Peers	-1.376	0.451	**	-0.324	0.420	
3	Large School	-0.029	0.166		0.055	0.188	
	Individual-Level Variables						
4	Overweight BMI	-0.209	0.149		-0.400	0.215	+
5	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---	
6	Underweight BMI	0.188	0.160		0.267	0.180	
7	Overweight Self-Perception	0.817	0.098	***	0.805	0.215	***
8	Parents' Perceive Adolescent as Overweight	0.310	0.251		0.322	0.340	
9	Missing Parents' Perception of Overweight	0.277	0.191		0.291	0.225	
10	Abridged Picture Vocabulary Test Score (PVT)	-0.009	0.004	*	0.010	0.005	*
11	Age	-0.153	0.062	*	0.133	0.065	*
12	Sports Participation	-0.358	0.138	*	-0.394	0.218	+
13	Missing Sports Participation	0.008	0.168		-0.184	0.184	
14	Latina/o	0.244	0.188		0.533	0.215	*
15	African American	-0.326	0.217		-0.097	0.265	
16	Asian American	0.368	0.234		0.690	0.331	*
17	Other Race/Ethnicity	0.482	0.261	+	0.259	0.393	
18	White (Reference Group)	---	---		---	---	
19	Lives with Both Biological Parents	-0.248	0.138	+	-0.131	0.158	
20	Parents' Education Level	-0.052	0.060		-0.057	0.063	
21	Ever Had Romantic Relationship	0.161	0.135		-0.127	0.138	
22	Pubertal Development Slower than Peers	0.064	0.151		0.250	0.180	
23	Pubertal Development Faster than Peers	-0.116	0.144		-0.077	0.175	
	Intercept	-1.700	0.064	***	-2.253	0.094	***
	School Level Variance (Tau)	0.073 **			0.064 *		
	N (Individuals)	3895			3792		
	N (Schools)	77			78		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Interestingly, in Table 11 (below), I do find evidence that girls' self-esteem and overweight self-perception is moderated by the weight attributes of general others and high status others. On average, girls have a 0.28 predicted probability of low self-esteem when they perceive themselves as overweight and attend a school where the average BMI of all girls is 22.97 (the mean) (Model 1, Row 7). The predicted probability decreases to 0.23 when girls attend a school with a higher average female BMI (23.86, or one standard deviation above the mean). The magnitude of the effect of the average BMI of high-status peers is similar and indicates that, on average, as the average BMI of high-status girls in the school increases, girls with overweight self-perceptions experience a decrease in the probability that they will report low self-esteem, net of all other variables (Model 2, Row 9). These findings provide further evidence that, at least for girls who may already be vulnerable to potentially harmful body ideals due to their overweight self-perceptions, the school context can serve as a mediating location where the local appearance culture can help prevent overweight self-perception from translating into a lowered assessment of global self worth.

Though I ran similar models for adolescent boys, there were no significant findings (the models are available by request from the author). Taken as a whole, the analyses suggest that the school context cannot buffer adolescent boys' emotional experiences of overweight self-perception.

Table 11: Unstandardized Laplace Coefficients from Multi-Level Models Predicting Low Self-Esteem, WII: Does Internalization Moderate the Impact of the School?

		Girls					
		Model 1			Model 2		
Row	School-Level Variables	B	SE		B	SE	
1	Average BMI of All Same-Sex Peers	0.127	0.104		---	---	
2	Proportion of Same-Sex Peers Trying to Lose Weight	-1.279	1.441		---	---	
3	Average BMI of High Status Same-Sex Peers	---	---		0.116	0.111	
4	Proportion of High Status Same-Sex Peers Trying to Lose Weight	---	---		-0.023	0.721	
5	Prop of Same-Sex African-American Peers	-1.393	0.516	**	-1.445	0.532	**
6	Large School	-0.047	0.192		-0.011	0.168	
	Cross-Level Interactions						
	Overweight Self-Perception by						
7	Average BMI of All Same-Sex Peers	-0.364	0.146	*	---	---	
8	Proportion of Same-Sex Peers Trying to Lose Weight	2.835	1.763		---	---	
9	Average BMI of High Status Same-Sex Peers	---	---		-0.305	0.117	**
10	Proportion of High Status Same-Sex Peers Trying to Lose Weight	---	---		2.076	1.317	
	Individual-Level Variables						
11	Overweight BMI	-0.172	0.173		-0.191	0.173	
12	BMI between the 25th and 85th Percentile (Reference Group)	---	---		---	---	
13	Underweight BMI	0.211	0.174		0.208	0.159	
14	Overweight Self-Perception	0.763	0.113	***	0.771	0.108	***
15	Parents' Perceive Adolescent as Overweight	0.318	0.256		0.317	0.246	
16	Missing Parents' Perception of Overweight	0.279	0.196		0.271	0.206	
17	Abridged Picture Vocabulary Test Score (PVT)	-0.009	0.004	*	-0.010	0.004	*
18	Age	-0.157	0.064	*	-0.156	0.062	*
19	Sports Participation	-0.356	0.150	*	-0.355	0.152	*
20	Missing Sports Participation	0.027	0.180		0.009	0.169	
21	Latina/o	0.248	0.198		0.238	0.189	
22	African American	-0.324	0.228		-0.322	0.270	
23	Asian American	0.392	0.246		0.368	0.241	
24	Other Race/Ethnicity	0.489	0.288	+	0.491	0.286	+
25	White (Reference Group)	---	---		---	---	
26	Lives with Both Biological Parents	-0.237	0.143	+	-0.245	0.146	+
27	Parents' Education Level	-0.052	0.061		-0.047	0.059	
28	Ever Had Romantic Relationship	0.183	0.139		0.167	0.147	
29	Pubertal Development Slower than Peers	0.061	0.178		0.064	0.153	
30	Pubertal Development Faster than Peers	-0.112	0.146		-0.120	0.151	
	Intercept	-1.697	0.072	***	-1.716	0.075	***
	School Level Variance (Tau)	0.070 **			0.078 **		
	N (Individuals)	3894			3894		
	N (Schools)	77			77		

*** p < .001; ** p < .01; * p < .05; + p < .10.

Source: The National Longitudinal Study of Adolescent Health

Discussion

In this chapter, I find a clear difference between adolescent boys and girls. For girls, the school context sometimes shapes their self-esteem, whereas for boys, I found no significant relationships. Though overweight self-perception is linked to low self-esteem for both adolescent boys and girls, this link is moderated by the school context only for adolescent girls. When girls do perceive their bodies as overweight, I find evidence that general others, similar others, and high status others matter. Girls are less likely to allow their overweight self-perception to affect their global self-esteem when there are more overweight girls around them – whether those girls are similar to them, high-status girls, or just general others in the school context. What these findings suggest is how powerful the school context is in conditioning how distressing body ideals are for adolescent girls when they perceive their bodies as not measuring up to macro-level U.S. normative standards.

Chapter 7: Conclusion

The majority of adolescents report being aware of the macro-level gendered body ideals present in U.S. society that equate feminine beauty with being thin and masculine attractiveness with being muscular (Milkie 1999; Nichter 2000); however, how youth incorporate or reject these ideals into their own weight-control decisions, self-perception of weight, and self-esteem varies dramatically based on adolescents' experiences with the local, immediate contexts of their daily lives: their school. When adolescents – both boys and girls – encounter school cultures that reinforce macro-level body ideals, they are even more likely to conform with their own weight-loss behaviors, self-perceptions and self-esteems than if they attend schools with cultures that contradict macro-level ideals. There is also variation within the school. Both boys and girls are particularly impacted by the values and behaviors endorsed by similar others, when similarity is defined by same-sex adolescents of a similar body size.

These findings suggest that meso-level social contexts may be particularly important to how individuals incorporate macro-level beliefs or values into their own behaviors and self-concepts. A substantial body of research on the U.S. has investigated the prevalence of a drive for thinness (particularly among girls and adult white, middle-class women) and the stigma associated with being overweight. Without a doubt, these macro-level values exist and affect individuals' lives. Yet a preponderance of research has shown that not all overweight people feel negatively about their weight (Crocker 1999) and not all girls' internalize pressure to be thin (Milkie 1999; Nichter 2000). In fact, both adults and adolescents can be quite resilient when it comes to coping with possessing a stigmatized identity (Crocker 1999; Link and Phelan 2007). What this dissertation adds to the existing literature is another way of considering how individuals

cope with body ideals (by comparing to similar others) and another way of identifying circumstances under which individuals may be more likely to conform to macro-level body ideals (when local contexts reinforce those norms).

Though schools are an ideal (and convenient) social context to investigate this social phenomenon because of their bounded nature, their link to adolescent identity, and because of how many hours a day adolescents spend within their walls, individuals move through meso-level social contexts throughout the life course. Some research has already identified the importance of social norms within meso-level contexts (defined by extensive friendship networks) to adults' health (e.g. Christakis and Fowler 2007). This research, in conjunction with the research presented in this dissertation, suggests that identifying bounded social groups where individuals spend a significant amount of their time and where the opinions of others in the context matter may be crucial to identifying locations where health interventions may be most effective.

In adulthood, the workplace may be one such context to focus on. Adults spend the vast majority of their waking hours within the workplace and it may be important for future research to assess whether similar patterns of social comparison on characteristics related to body weight occur within work settings. Does judgment move from the lunchroom to the break room? Do the values, physical appearances, and dieting and exercise behaviors of colleagues or fellow workers matter as much to an individual as they appear to matter to adolescents?

In terms of meso-level contexts that are amenable to policy interventions, it is worth acknowledging how comparatively easy it is to enact policy within schools compared to other meso-level social contexts. Adolescence is also a stage in the life course when youth are making important decisions that affect and in many ways determine their future health trajectories. Adolescents are also particularly peer-oriented

(Giordano 2003), a trait that appears in the evidence presented in this dissertation and that policy-makers can use to their advantage. Researchers have had some success helping adolescent girls combat the drive for thinness through peer-led interventions in meso-level, small groups. Interestingly, researchers leverage the ability of small groups and peer leaders to reinforce the norms presented in the intervention to improve the success of the intervention (Becker et al. 2008; Becker, Smith, and Ciao 2006; Stice et al. 2008). Key to the programs is instilling in girls a sense of similarity with other group members and shared ideals that de-emphasize the normative thin ideal. It is near to impossible to change macro-level values presented in social media or advertising in the U.S.; however, it is more feasible to implement programs in meso-level groups that help individuals cope with macro-level values that may be harmful to self-concept. The research presented in this dissertation demonstrates how important the body ideals present in schools are, suggesting that school contexts may be an important location for interventions.

Gender & Body Weight

The research on prior interventions and its focus on adolescent girls points to another interesting set of conclusions that develops out of this dissertation. As a society and even as researchers, we tend to focus more on the weight issues related to adolescent girls, but the results presented here show that boys negotiate their weight control and self-perception in social settings, sometimes to a greater extent than adolescent girls (at least at this stage in the life course). It is fascinating how similar boys and girls are in terms of how important the school context is to how they perceive their weight and decide to practice weight control. Both boys and girls' weight-loss behaviors were associated with how prevalent overweight same-sex peers were in the school. When the school had more overweight same-sex adolescents, individuals in that school were less likely to report

engaging in weight-loss behaviors, regardless of whether or not they were a boy or a girl. Overweight boys and girls' weight-loss behaviors were particularly associated with the weight-loss behaviors of other overweight schoolmates (as opposed to non-overweight or popular adolescents' weight-loss behaviors). In other words, the behaviors of similar others particularly mattered to overweight boys and girls.

Two significant and interesting differences between boys and girls did appear in the analyses presented in this dissertation. First, adolescent boys' overweight self-perception was linked to the school context in more ways than it was for adolescent girls. Boys perception was associated with the characteristics of general others and similar others, whereas girls were only affected by the prevalence of misperception of overweight among general others. This suggests that adolescent girls may not use the school as a whole to construct their self-perception – at least not to the same extent as adolescent boys. Because these analyses focus on high schools and late adolescence, it may be that adolescent girls establish a stable self-perception of weight earlier in their life course than adolescent boys. This suggests that future research should focus on the role of schools and the weight-related cultures housed within at earlier stages in the life course with an emphasis on adolescent girls' self-perception and body image.

The second interesting gender difference to appear was that the link between boys' self-perception of weight and self-esteem was not moderated by the school context, whereas it was for girls. Boys' self-esteem is impacted by overweight self-perception – boys tend to report lower self-esteem when they perceive themselves as overweight. This suggests that it is not simply that boys do not experience overweight as harmful to their sense of self. Why do girls find certain school contexts protective to their sense of self-worth when boys do not? This is an interesting and complex question that warrants further investigation that is perhaps beyond the scope of the Add Health data.

Despite these differences in how schools impact adolescent boys and girls, there were important similarities between boys and girls in terms of individual risk factors. For example, both boys and girls were at higher risk of reporting low self-esteem when they perceived their body as overweight. In other words, boys are not immune to the anti-fat attitudes that are prevalent in U.S. society. When boys perceive themselves as overweight, they also tend to negatively evaluate their self-worth. Another similarity between boys and girls concerned the role of parental perception of adolescents' overweight status. Both boys and girls whose parents perceive them as overweight are more likely to be engaged in weight-loss behaviors and are more likely to see themselves as overweight, regardless of their actual weight. Interestingly, parents' report of the adolescents' overweight status is not significantly related to having low self-esteem for either gender. Could this be a way to help adolescents learn to accurately identify their weight without promoting low self-esteem? Further research should investigate this phenomenon.

Overall, it is notable that adolescent boys and girls are *both* impacted by the school context. This suggests that the body weight ideals found in meso-level contexts where daily life is lived, help both boys and girls interpret normative macro-level body ideals found in U.S. society. When the school context reinforces macro-level ideals, both boys and girls are more likely to have behaviors and self-perceptions that conform to those ideals; on the other hand, when the school context offers a protective alternative to macro-level ideals, adolescents of both genders may be less likely to conform to macro-level gendered body ideals.

LIMITATIONS

While I have provided findings from a nationally-representative and diverse sample of adolescents and schools, on the role of schools in adolescents' weight-loss behavior, self-perception, and self-esteem, there are some limitations to this study that are worth mentioning. First, at this point in time, the Add Health data is over ten years old; however, it remains the only nationally-representative dataset, to my knowledge, where it is possible to assess the role of school context on adolescents' self-perception and weight-control behaviors. Second, though self-reported weight is highly-correlated with interviewer-reported measures, in order to ensure accurate time order, I had to rely on adolescents' self-report of their weights. In an ideal study, weight and height would be objectively measured; however, 96% of adolescents in Add Health are correctly classified as overweight using self-reported height and weight (Goodman, Hinden and Khandelwal 2000). To further ensure that this limitation did not affect the substantive findings of this study, cross-sectional models were run using Wave II interviewer-reported height and weight. Generally, there was no substantive change in the conclusions presented here, and therefore, I decided to maintain the use of Wave I and II data. Third, no measures of experiences with weight-related teasing or discrimination are available in Add Health, though they would certainly add to the richness of this study. Though Add Health does provide information on adolescent boys' weight-gain behaviors and underweight self-perceptions, it was beyond the scope of this dissertation to investigate the role of school contexts and social comparisons in those aspects of body weight. Given how important the school context is to boys' weight-loss behaviors and overweight self-perception, future research should investigate boys' weight-gain behaviors and underweight self-perception.

The final limitation of this research concerns variation in body ideals among adolescents of different race and ethnic backgrounds. Though I control for the proportion of African Americans in the school and individual adolescents' race and ethnicity, the story is certainly more complicated. Prior research has found that African-American girls often differ significantly from white adolescent girls in terms of their weight perceptions and body image (Martin, Frisco and May 2009; Milkie 1999; Nichter 2000). For example, African-American girls are often less likely to allow overweight self-perception to influence their self-esteem or body dissatisfaction (Ge et al. 2001) and are more likely to perceive an objectively heavier weight as "about the right weight" (as opposed to overweight or underweight) (Martin, May, and Frisco 2010). At the same time, some studies have found that the protective effect African-American girls experience is in part determined by the racial composition of their friendship group (Abrams and Stormer 2002). African-American girls with ethnically-heterogeneous friendship groups were more likely to have internalized thinness norms than their counterparts with homogeneous friend groups. Expanding this question to the school context would be extremely interesting for future research. For example, in the Add Health high school sample (of 9th, 10th and 11th graders), 20% of African American girls are unnecessarily trying to lose weight (compared to approximately 33% of white girls). 13% of African-American girls misperceive a healthy weight as overweight (compared to 24% of white girls). What role does school context play in these girls developing unnecessary weight-loss behaviors and misperceptions of overweight and do they have the same consequences to health and well being that they have for white girls? These are important questions to have answered and it may be possible to answer them using a subset of Add Health schools that have within-school racial variation.

SCHOOLS, SOCIAL COMPARISONS, & BODY WEIGHT

Despite the limitations of this research, this dissertation provides substantial evidence that schools play an important role in shaping adolescents' decisions to practice to weight control, overweight self-perception, and how these processes affect their self-esteem. How widespread body ideals affect adolescents depends in part on the weight-related culture they experience in their schools. Because weight can be such a difficult issue for adolescents, it is not surprising that adolescents appear to be extremely sensitive to the school as a source of information used to interpret their own weight. What is interesting is how discriminating adolescents appear to be in their choice of targets for social comparison. Popular peers are generally not who adolescents turn to when trying to decide whether or not they are overweight or need to lose weight. Instead, adolescents appear to compare their bodies to similar others found in the every day settings of their lives. Research on social comparisons has shown that when individuals compare to similar others as opposed to high-status or general others, individuals are usually motivated by a desire to obtain an accurate self-evaluation of, in this case, body weight. It is important to note that this was the dominant social comparison pathway that links adolescents to their schoolmates. In the absence of direct relationships such as friendships, but in the shared space of the school, adolescents appear to prefer comparisons to similar others as opposed to popular others, perhaps to preserve their sense of self. Importantly, these patterns appear for both boys and girls in a nationally-representative sample and net of a substantial amount of controls for individual and school factors that may be associated with body weight. As researchers investigate other meso-level social contexts where values and ideals that impact individuals' lives may operate, they should keep in mind how important similar others may be to motivating individuals' behaviors and self-perceptions.

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