

BODY MASS INDEX AND SELF-PERCEIVED WEIGHT: ARE THEY ASSOCIATED
WITH SEXUAL AND RELATIONSHIP HEALTH?

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ABSTRACT

KHADIJA R. TURAY: Body Mass Index and Self-Perceived Weight: Are They Associated with Sexual and Relationship Health?
(Under the direction of Carolyn Tucker Halpern)

This dissertation explores associations between body mass index (BMI) and self-perceived weight during adolescence and two health outcomes during young adulthood:

1) testing positive for one or more of three sexually transmitted diseases (STD) (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) and 2) reporting intimate partner violence (IPV) victimization. Both papers use National Longitudinal Study of Adolescent Health (Add Health) data from Waves 1, 2, and 3.

In the first paper, logistic regression models examined associations between overweight BMI, self-perceived overweight, correct overweight perceptions, and misperceived overweight during adolescence and testing positive for one or more STDs (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) during young adulthood as determined by urine testing. In unadjusted and adjusted models, adolescent overweight BMI and self-perceived overweight were not associated with young adult STD status among either gender. Adolescent correctly perceived overweight was associated with young adult STD status among males when pooled by race, and among non-Hispanic Black males in unadjusted models. Associations were no longer statistically significant when sociodemographic variables were included in models. Correctly perceived overweight and misperceived overweight were not significantly associated with STD status among females. Future research should explore the

associations of interest in this paper with different adolescent body image measures and a wider variety of STD outcomes to determine if associations exist.

In the second paper, logistic regression models examined the effects of adolescent overweight BMI and self-perceived overweight on the odds of experiencing IPV victimization during young adulthood. Overweight BMI and self-perceived overweight during adolescence were not significantly associated with IPV victimization during young adulthood among males. Among females, when pooled by adolescent BMI and race, adolescent overweight BMI was associated with increased odds of IPV victimization in the fully adjusted model. When analyses were stratified by race and adolescent BMI, neither adolescent weight concept was significantly associated with IPV victimization among females. Consistent with previous research, longer relationship duration, cohabitation, non-Hispanic Black race, and child abuse were risk factors for young adulthood IPV victimization. Overall, this dissertation contributes to the literature by exploring the effects of adolescent BMI and body image on understudied outcomes.

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CHAPTER 1: Introduction

Young adults are disproportionately affected by sexually transmitted diseases (STDs) and intimate partner violence (IPV) when compared with other age groups. In 2011, the annual chlamydia rate among 20-24 year olds was 1,343.3 per 100,000 among males and 3,722.5 per 100,000 among females, compared to rates ranging between 689.7 and 44.8 per 100,000 among males and 1,343.6 and 35.8 per 100,000 among females ages 25 to 54 (1). Gonorrhea rates have similar age disparities. Intimate partner violence is also higher among young adults. Between 2001 and 2005, the average annual nonfatal IPV victimization rate was 11.3 per 1,000 persons for females and 1.8 per 1,000 persons for males ages 20-24, compared to 4.4 per 1,000 persons among females and 1.2 per 1,000 persons among males ages 35-49 (2).

STDs and IPV have many negative effects on well-being. Untreated STDs are associated with reproductive problems like infertility, poor birth outcomes, and pregnancy complications (3). Further, untreated STDs like trichomoniasis can increase the likelihood of acquiring HIV (4). IPV victimization has negative implications for physical, mental, and reproductive health. Men and women experiencing IPV victimization have increased odds of having ever had activity limitations related to poor physical, mental, or emotional health, exhibiting HIV risk factors like having ever used intravenous drugs, and increased risk for injury and depressive symptoms (5, 6). Among women, IPV is also associated with increased odds of negative cardiovascular outcomes like heart disease and stroke, and lower odds of using their preferred contraceptive method (5, 7). For some individuals, IPV during young adulthood may reflect that a cycle of violence is being continued during the lifespan, as individuals who experience

childhood abuse and adolescent dating violence have increased odds of experiencing IPV victimization during young adulthood (8).

More young adult women than men experience STDs and IPV victimization. For example, the 2011 chlamydia rate was higher among females ages 20-24 (3,722.5 per 100,000) than males (1,343.3 per 100,000) within the same age range (1). Gonorrhea rates had similar gender disparities. In Wave 3 of Add Health, the prevalence of trichomoniasis is 2.8% in females and 1.7% in males (9). Also, women are more likely to experience nonfatal IPV victimization and be killed by an intimate partner. Between 2001 and 2005, intimate partners committed 30% of all homicides among females, compared to 5% of all homicides among males (2). Further, in opposite sex couples, violence perpetration by a man is associated with a higher odds of injury (10).

Racial differences in STDs and IPV also exist among young adults. The Centers for Disease Control and Prevention estimate that in 2011 chlamydia rates in Black females (7,680 per 100,000) ages 20-24 were higher than among White females (1,595 per 100,000) of the same age (1). Gonorrhea rates had similar patterns (1). The lifetime prevalence of intimate partner rape, physical violence, and/or stalking victimization is higher among non-Hispanic Black than non-Hispanic White females (43.7% vs. 34.6%) and males (38.6% vs. 28.2%) (11).

It is important for the public health community to understand factors contributing to STD and IPV rates during young adulthood given their negative effects on health and existing gender and racial disparities. A better understanding of adolescent factors that predict STD infection and IPV victimization during young adulthood can help develop prevention programs and policies.

Extant longitudinal research examines how family and school level factors, individual level variables like religious importance and intelligence, and sexual behaviors during adolescence are associated with young adult STD status (12-15). When

adolescent physical appearance has been used to predict an STD diagnosis during young adulthood, usually self-perceived pubertal status has been examined rather than related indicators such as self-perceived weight (12). Research about young adulthood IPV victimization typically examines the predictive abilities of childhood mistreatment experiences (8, 16). Further, most existing research about violence and BMI has focused on associations between adolescent BMI and bullying or teasing (17, 18).

However, it is unknown if overweight, whether real or perceived, during adolescence could have a long-term effect on STD and IPV risk. Such an association is plausible because adolescence is a significant time in the life course when expectations about sexual and intimate relationships are first tested and established, pubertal changes prompt appearance comparisons, and appearance assumes a social meaning within the realm of romantic relationships (19). According to life course theory, collectively, these experiences could influence health later in life (20). Specifically, adolescent overweight may have lasting influences on health by creating power differentials in future sexual and intimate relationships. Research has found that weight and/or body image is associated with relationship dynamics throughout the life course (21, 22). However, to the author's knowledge, the potential long-term association between adolescent overweight, as indicated by BMI or self-perceptions, and young adult sexual and relationship health has not been explored empirically. The purpose of this dissertation is to fill these gaps in the current literature and explore how body mass index (a physical measure) and self-perceived weight (a cognitive weight concept) during adolescence influence two common health outcomes in young adulthood: 1) testing positive for a sexually transmitted disease and 2) experiencing intimate partner violence victimization.

BMI, Body Image, and Sexually Transmitted Diseases

There has been some work examining associations among measured BMI, body image, and sexual health. However, findings are mixed, depending on age, gender, race, sampling, and type of risk-taking examined. Specifically, two studies using nationally representative adult samples found no relationship between BMI and select STD outcomes. Using a sample of men (mean age 34.43) and women (mean age 33.60) from the 1999-2000 National Health and Nutrition Examination Survey (NHANES), Nagelkerke et al. (2006) found in adjusted analyses that being classified as overweight or obese was not a statistically significant predictor of Herpes Simplex Virus type II serostatus among men or women (23). Another analysis using a sample of women ages 20-59 from the 1999-2004 NHANES also found in an adjusted analysis that BMI was not associated with testing positive for human papilloma virus (24). However, one study of 704 females (mean age 21.4 years) followed 12 months postpartum, found in adjusted analyses that women classified as overweight or obese had higher odds of incident chlamydia and gonorrhea when compared with women classified as normal weight (25).

In contrast to studies using adult samples, research with adolescent samples suggests that overweight BMI, self-perceived weight, and body satisfaction can be positively associated with sexual risk behaviors (21, 26, 27). In a cross-sectional study using a clinic-based sample of 522 Black females between the ages of 14 and 18, Wingood et al. (2002) found that when controlling for a variety of factors including measured BMI, those who were more dissatisfied with their bodies had greater odds of never using condoms in the last 30 days and reporting that they had unprotected vaginal sex during the last six months (21). In another cross-sectional analysis of a nationally representative sample of adolescent females, Akers et al. (2009) found in models adjusted for history of IPV, age, and race that those who perceived themselves as overweight had lower odds of using a condom at last sex than those who perceived

themselves as about the right weight (26). When stratified by race, weight perception accuracy, but not self-perceived weight, was a statistically significant predictor of sexual risk behaviors examined among Whites. Specifically, when compared with an accurate weight perception, weight overestimation was associated with lower odds of having used a condom at last sex (26). Among Blacks, the only statistically significant finding was that self-perceived overweight was associated with increased odds of having four or more lifetime partners. These findings suggest that patterns of associations may vary by race, body image measure, and type of risk behavior examined.

Other studies using samples of adolescents and college students have found a significant association between BMI and sexual risk behaviors. A study by Ratcliff et al. (2011) using the Youth Risk Behavior Survey found that in adjusted analyses adolescent females with a higher BMI (≥ 99 th percentile on the CDC growth charts) had higher odds of consuming alcohol or using drugs before their last sexual encounter than their peers with a lower BMI (those between the 5th-84th percentile) (27). This association was not observed among males. However, in the same study, girls with a higher BMI did not have increased odds of having sex before age 13, having four or more lifetime partners, or not using a condom during last sex than their peers with a lower BMI. Similarly, another study using a sample of adolescent girls (ages 16 or 17 in 2000 or in 2002) in the National Longitudinal Survey of Youth (NLSY) Young Adult Survey found that obese and non-obese 16 and 17 year olds did not differ in condom use, or in having three or more sexual partners in the last year (28). However, results varied between non-Hispanic Whites and non-Hispanic Blacks in the sample. When compared with Non-Hispanic obese Blacks, Non-Hispanic obese Whites had a greater likelihood of having older partners and not using condoms at most recent sex. Using a sample of college students, Eisenberg et al. (2005) found that females with an overweight or obese BMI had higher odds of being intoxicated at last intercourse and having a causal partner than

their counterparts with a normal BMI, but did not find an association between body image satisfaction and risky sexual behaviors like being intoxicated at last intercourse, not using a condom, or not using a method to prevent unintended pregnancy (29). No statistically significant relationships between BMI and sexual risk behaviors, or body satisfaction and sexual risk behaviors were found among males.

In summary, these studies show that statistically significant associations between BMI, body image, and sexual health vary when BMI (as indicated by self-reported or measured height and weight) or a body image measure is the independent variable of interest. The two studies using NHANES data did not find an association between BMI (as indicated by height and weight) and STD status (23, 24), but did not include a body image measure. Eisenberg et al. (2005) found statistically significant associations between overweight/obese BMI and being intoxicated at last intercourse, but not body image satisfaction and sexual risk behaviors (29). However, Wingood et al. (2002) and Akers et al. (2009) found associations between a body image measure and sexual risk behaviors (21, 26). These findings suggest that BMI and body image may influence sexual health differently, and signal a need for further empirical investigation that examines the influence of an overweight BMI measure and a body image measure separately in one analytic sample.

There are additional gaps in the literature. First, none of the research focusing on overweight BMI classification and adult STD outcomes considered the developmental significance of adolescence and its potential longitudinal influence on adult sexual risk behaviors. Yet, adolescence is important to consider in such an investigation because it is an impressionable time period in the life course when individuals' bodies change shape due to puberty and individuals are exposed to gendered social norms related to appearance. Adolescents may also experience weight stigma and bias in the form of social exclusion (30). The terms weight stigma and weight bias can be used

interchangeably (31). However, specifically, weight stigma refers to sharing a trait with a population that experiences prejudice, and weight bias refers to being judged based on appearance in ways that may lead to experiencing prejudice and maltreatment (31). Concurrently with physical changes and potential experiences of weight stigma or bias, adolescents form opinions and expectations about sexual and intimate relationships, establish identities, and experience fluctuations in self-esteem as they cognitively adjust to differences between their ideal and real appearances (32).

Secondly, past research utilizing samples of adolescents shows that there are associations between BMI, body image, and adolescent sexual risk behaviors. However, it is not known whether adolescent BMI and body image influence sexual health during young adulthood. Researchers who have found that BMI or body image influences adolescent sexual behaviors have called for longitudinal research that will help clarify the developmental significance of adolescent weight-related factors (26, 33). This dissertation's first paper will use a longitudinal dataset rather than a cross-sectional dataset to address these existing literature gaps.

BMI, Body Image, and Intimate Partner Violence

Research has established that as a form of interpersonal violence, weight-based teasing can negatively affect well-being (34-36). Despite known vulnerabilities to mistreatment among those with higher BMIs in interpersonal contexts, conclusions are not consistent or clearly established about the role of weight bias in intimate relationships (37). Extant literature about associations between overweight and intimate relationships during adolescence often focuses on sexual risk behaviors or the likelihood of sexual relationships (21, 26, 33, 38). Studies with samples of adults often focus on how higher BMI influences entering intimate partnerships, but not on violence within the partnerships (39, 40).

Little is known about how overweight BMI and/or self-perceived overweight may contribute to IPV victimization, although most existing studies of adults have not identified statistically significant associations. For example, a cross-sectional study using 2005 Behavioral Risk Factor Surveillance System data found that men and women over age 18 who have ever experienced any type of IPV in their lifetime do not have higher odds of having a current BMI greater than 25 (overweight) when compared with those who have never experienced IPV. However, findings for women just missed significance at the 0.05 level (AOR: 1.1, CI: 1.0-1.2) (41). Another population-based sample of 13,978 Australian women (average age 47.7) found in a univariate analysis that women with a BMI classified as underweight, overweight, or obese did not differ from those with a BMI classified as normal in their odds of having a history of domestic violence (42). In bivariate analyses, a study of 382 women's medical charts found that BMI did not significantly differ between IPV victims of emotional abuse, victims of physical/and or sexual abuse, and nonvictims (43). However, in a bivariate analysis using a sample from a large Health Maintenance Organization, Bonomi et al. (2006) found that women who reported any IPV victimization during adulthood had a higher mean BMI than those who did not (44).

Also, evidence suggests that there is not an association between how one feels about their appearance and relationship violence. In bivariate analyses, Raiford et al. (2007) found that among a sample of 522 Black adolescent females, negative body image was significantly associated with experiencing an initial episode of dating violence during a one year follow up period, but in multivariate analyses, body image was not a significant predictor (45). Similarly, a study of male and female adolescents by Brooks-Russell et al. (2012) found that in adjusted models, body satisfaction/image did not distinguish between those who experienced higher and lower levels of dating violence victimization (46).

Despite the lack of associations noted above, a body of literature has identified associations between weight and non-physical conflict in couples. However, the conflict is not operationalized in terms of verbal abuse. A study by Eisenberg et al. (2011) found that adolescent experiences with weight-teasing are associated with higher odds of receiving hurtful weight-related comments from a significant other in young adulthood among females, but not males in adjusted models (47). Other studies have found that weight is associated with discord in romantic relationships. Falkner et al. (1999) found that among the heaviest male and female participants, spouses were a common source of weight related mistreatment among a sample of adults enrolled in a weight gain prevention intervention (48). Other studies have found that perceived weight evaluation by a husband is associated with body dissatisfaction among wives, and that mixed weight couples (combination of overweight and healthy weight individuals) have more conflict than matched weight couples (22, 49). Yet, in multivariate analyses, another study found no association between BMI and quality of a person's relationship with their spouse as characterized by factors like perceived understanding of feelings, reliability, and believing that the other person cares (50).

In a sample of college students, Sheets and Ajmere (2005) found that over half of the women who had been told by a significant other that they should lose weight had a BMI above the sample mean (51). The authors found that these comments were not associated with self-esteem, but did not measure if the respondents perceived the comments as hurtful or abusive. However, some studies have found that IPV perpetrators have called victims fat or ugly during instances of abuse (52, 53). Researchers have recognized this form of psychological abuse by including the item "called my partner fat or ugly" as a measure of psychological aggression on the Conflict Tactics 2 scale (54).

It is important to understand the association between overweight, as indicated by BMI or self-perceptions, and IPV for several reasons. First, weight stigma and IPV are associated with negative mental health outcomes. Studies have found that consequences of experiencing weight stigma in its various forms include lower self-esteem and depressive symptoms throughout the life course (34, 55). Secondly, research has given attention to associations between overweight and stigma in healthcare and workplace settings during adulthood (37), but it is important to explore other interpersonal situations in which overweight BMI, or history of overweight BMI, may be a risk factor for maltreatment. It has been suggested that overweight individuals may unreasonably perceive that they deserve mistreatment or feel peer pressure to have a partner in young adulthood even if the partner treats them poorly (47). Other research has found that overweight women attribute rejection in relationships to their weight (56). Third, history of overweight and IPV victimization can decrease access to social support. Overweight youth experience decreased emotional support from family during adulthood as their BMI increases (50). Simultaneously, IPV victimization experiences can decrease access to support from friends and family (57).

Research Aims

This dissertation examines whether measured overweight BMI and self-perceived overweight during adolescence are associated with two outcomes in young adulthood 1) diagnosis with an STD (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) as indicated by a urine test administered at Wave 3 of Add Health and 2) reporting IPV victimization during the last 12 months at Wave 3. Throughout the dissertation measured overweight BMI indicates being greater than or equal to the 85th percentile on the Centers for Disease Control/National Center for Health Statistics 2000 reference curves (58). Also, the term self-perceived weight refers to the following Wave 2 National Longitudinal Study of Adolescent Health question: “How

do you think of yourself in terms of weight?” Respondents could answer very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight. The implications for overweight BMI and self-perceived overweight for sexual debut and health can differ between sexes and races. For cultural reasons, measured overweight BMI and self-perceived overweight are likely to have a differential influence on outcomes for males and females. Although males are the target of cultural messages about an unrealistic appearance, for females, traditionally a greater emphasis has been placed on thinness (59, 60). There are also racial disparities in both of the outcomes of interest. Therefore, in both dissertation papers, analyses will be stratified by gender and race.

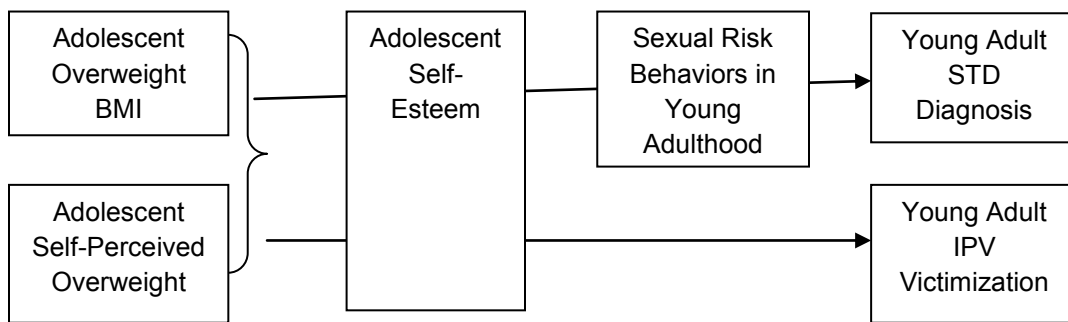
The dissertation consists of two papers and a conclusions section. Both papers are guided by objectification and life course theories.

- **Paper 1** of this dissertation examines associations between measured overweight BMI and self-perceived overweight during adolescence and having a positive urine test for one or more of three STDs (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) in young adulthood.
- **Paper 2** examines if measured overweight BMI and self-perceived overweight during adolescence are associated with reporting IPV victimization during the last 12 months in young adulthood.
- **The conclusions section** summarizes findings and provides recommendations for public health practice and future research.

The conceptual model below (Figure 1) shows hypothesized theoretical pathways linking adolescent measured overweight BMI and self-perceived overweight to young adult STD diagnosis and IPV victimization. The conceptual model also shows how adolescent self-esteem and sexual risk-taking in young adulthood are hypothesized to mediate the association between measured BMI and self-perceived weight during adolescence and

young adult health outcomes. Although not shown in the conceptual model, various factors may act as confounders (e.g., race, young adult measured BMI, parent education, child physical/sexual abuse, self-perceived pubertal timing, respondent age at Wave 2, respondent intimate relationship characteristics at Wave 3, parent's highest level of education, family structure during adolescence, and the Add Health Peabody Vocabulary Test Score (a proxy for verbal intelligence)). These factors will be controlled for statistically in analyses.

FIGURE 1: Dissertation conceptual model



It is possible that associations between adolescent measured BMI or self-perceived weight and adolescent self-esteem in the conceptual model are bi-directional. However, the theoretical basis of the study (explained in Chapter 2) suggests that during adolescence, appearance influences self-esteem, not the reverse. Also, given the social context of adolescence, in part defined by appearance comparisons and the commonality of weight-teasing, it is possible that measured overweight BMI and self-perceived overweight contribute to lowered self-esteem. This pattern is most closely reflected in research showing that weight-teasing during adolescence predicts negative outcomes like lowered self-esteem (35). Exploring the mediating role of self-esteem in the associations of interest in both papers of this dissertation is important because efforts can be implemented to change self-esteem in ways that are protective against negative sexual and relationship health outcomes. Understanding the role of self-esteem

in the associations of interest is also important because it can improve the public health community's understanding of how measured overweight BMI and self-perceived overweight during adolescence influence well-being.

Data will be stratified by adolescent measured BMI (normal BMI as indicated by greater than or equal to the 5th percentile and less than the 85th percentile on the CDC growth curves and overweight/obese BMI as indicated by greater than or equal to the 85th percentile on the CDC growth curves) to assess associations between correctly perceived and misperceived overweight during adolescence and young adult health. In models among those who had a normal measured adolescent BMI, a dichotomous adolescent self-perceived weight variable indicating “about the right weight” perception or “slightly/very overweight” perception will indicate *misperceived overweight*. In models among those who had an adolescent measured overweight/obese BMI, a dichotomous self-perceived weight variable indicating “about the right weight” perception or “slightly/very overweight” perception will indicate *correct overweight perception*.

Practice Implications

Research has often explored linkages between adolescent overweight BMI (based on measured or self-reported height and weight) and eating behaviors (61, 62) as well as adolescent body image and eating behaviors (63, 64). However, it is important to understand how overweight BMI and perceived overweight during adolescence influence other aspects of well-being like sexual health and intimate relationships, both of which are a normative part of development. Further, it is important to learn more about the sexual and relationship health trajectories of adolescents with an overweight BMI given recent increases in the prevalence of adolescent overweight (65, 66).

It is conceivable that population-wide increases in the prevalence of obesity could decrease stigma experienced by those who are overweight. However, between 1999 and 2004, secular changes in weight-related teasing among adolescents did not

change among overweight females, but declined among overweight males (67). Among adults between the ages of 35 and 65, weight/height (body size) discrimination rates increased between survey periods in 1995-1996 and 2004-2006 (68). Therefore, even if overweight has become normative across the lifespan, it is still a visual cue that carries stigma in America.

International and national recommendations for sexuality education already suggest that youth should understand what influences how they feel about their bodies. The Guidelines for Comprehensive Sexuality Education published by the Sexuality Information and Education Council of the United States suggest that human development education efforts that target adolescents discuss body image and its ability to influence behavior (69). Guidelines for sexuality education published by the United Nations Educational, Scientific, and Cultural Organization recommend that adolescents learn skills and concepts related to body image and bodily integrity like “a person’s value is not determined by their appearance (p.24);” “one’s body image can affect self-esteem, decision making, and behavior (p.24);” and “men’s and women’s bodies are treated differently and double standards of sexual behavior may impact upon social and sexual interactions (p.25)” (70).

If the hypothesized associations of interest are statistically significant in this dissertation, findings can be used to advocate for improved curricula for adolescents about associations between body image, intimate relationships, and sexuality. Few, if any, STD prevention programs address the potential implications of body image for sexual behavior and attitudes about sexual relationships (21, 25). Further, the public health community has been unable to identify very many modifiable adolescent factors that predict young adult STD risk. To date, factors like earlier age at first sex (71) and parent/family connectedness (72) have been associated with sexual behaviors during adolescence but not with STD status in young adulthood (14), which decreases their

promise to serve as intervention points for long term health. If this dissertation identifies self-perceived overweight as a predictor of sexual risk, it will offer additional intervention options. Also, given the recent increase in adolescent obesity, it is important to understand normative aspects of development like sexual and intimate relationship health among this population.

In 2013, the United States government reauthorized the Violence Against Women Act to improve community services and legal frameworks related to IPV. However, more IPV research is needed to inform prevention programming. The field of IPV public health research has only gained momentum during the last 40 years, making it a relatively new field when compared with other public health matters (73). Findings from the second paper of this dissertation could help identify points for IPV prevention related to appearance stereotypes and intimate relationships, and effective communication within relationships about appearance. Some adolescent IPV prevention curricula like Safe Dates already address the role of gender stereotypes in dating relationships. However, understanding factors that are influenced by gender stereotypes could offer other points for intervention and integrated programming. Results from the second paper could help determine if self-perceived overweight is an attitude adolescent IPV prevention efforts should address.

CHAPTER 2: Theoretical Overview

This dissertation uses two theoretical perspectives to examine how adolescent measured BMI and self-perceived weight may be associated with young adult health: life course theory and objectification theory. The life course theory concept of “sensitive periods” informs the longitudinal nature of both papers. A sensitive period is a time in the life course “when an exposure has a stronger effect on development and subsequent disease risk than it would at other times” (p. 781) (74). In this dissertation, I conceptualize adolescence as a sensitive period due to the unique social and physical changes that happen during that time. Objectification theory offers hypotheses about how measured overweight BMI and self-perceived overweight may be associated with sexual and relationship health, as well as the mediating properties of adolescent self-esteem.

Objectification Theory and Adolescent Development

Traditionally, outcomes like the internalization of the thin ideal, eating disorders, and body satisfaction have been explored using objectification theory (75, 76). The theory posits that women are socialized to view themselves as objects whose value is derived from aesthetic appeal to others (77). Also, as a result of intensified objectification, individuals may begin to internalize and view their bodies in ways that they believe others view their bodies (77). The process of internalizing feelings about one’s appearance could be driven by social learning, whereas individuals receive feedback about their appearance from others, or identification whereas an individual adopts the views of influential others like peers or romantic partners (78). Research has found that among adolescents, the association between conversations with friends about

appearance and body dissatisfaction is mediated by the internalization of appearance ideals (79). According to objectification theory, when individuals assume the viewpoint of others they begin to engage in “spectatoring,” or self-objectification. Spectatoring is a cognitive process that involves closely monitoring one’s physical appearance to the point where concerns about appearance may manifest (77, 80, 81).

Objectification theory can be applied to the developmental context of adolescence. Specifically, developmental processes occurring in adolescence can be conceptualized as catalysts for objectification and spectatoring. For example, appearance awareness may be increased by differences in pubertal timing that prompt social comparisons and peers may unjustly base social acceptance on appearance. Perception of, or increased awareness of, a socially stigmatized appearance like overweight, is also likely to occur during adolescence because of physical and social changes during that time. Feminist perspectives have suggested that understanding interactions between physical changes related to puberty and a society that supports physical objectification is a critical developmental task during adolescence (82, 83). Further, Lerner (1985) posits that demands on an adolescent to cognitively reconcile their changing appearance with social values makes adolescence an ideal “natural laboratory” for examining interactions between biological changes and psychosocial functioning (84).

Life Course Theory and Potential Long-Term Consequences of Measured Overweight BMI and Self-Perceived Overweight During Adolescence

During adolescence, individuals likely receive feedback about appearance from actual or potential intimate partners for the first time. Such situations and feedback potentially received during those situations have been hypothesized to influence how an adolescent views their own appearance (19). For example, among a sample of adolescent females, Halpern et al. (2005) found that being in a relationship without

sexual intercourse was associated with an increased likelihood of dieting (33). The authors hypothesized that girls were dieting to keep the interest of the partner with whom they had not had sex.

Overall, research concludes that overweight BMI is inversely associated with the likelihood of dating and sexual activity (33, 38, 85, 86). These findings suggest that overweight BMI is stigmatized within the context of intimate relationships during adolescence, especially among females. Given that adolescence is a context when appearance concern is heightened, higher BMI is stigmatized in intimate relationships, expectations about partner behaviors begin to develop, and sexual negotiation skills are learned, life course theory would predict that these events would have a long-term effect on young adult health. Specifically, life course theory would suggest that socialization related to appearance and intimate relationships during adolescence would establish a precedent for future sexual health and intimate relationship outcomes (20). Stigma associated with overweight, measured or self-perceived, could theoretically contribute to power differentials within relationships throughout the life course. Overweight/obese teens rarely transition to a healthy weight during young adulthood (87). Therefore, it is likely that weight stigma, either self-imposed or from others, can persist from adolescence to young adulthood. Simultaneously, it is likely that experiences with weight bias within the context of intimate relationships during adolescence can also occur during young adulthood. Studies with college students have shown that young adult men and women rank obese individuals as being less desirable sexual partners than those with a mental illness, and that obese individuals are rated as less sexually attractive and desirable than their normal weight counterparts (88, 89).

Measured overweight BMI and self-perceived overweight during adolescence may influence young adult health through adolescent self-esteem. Given that during adolescence, particularly early adolescence, self-consciousness is heightened (90), a

person's self-esteem may be reduced if they have or perceive themselves to have a stigmatized appearance like overweight. Cross-sectional research, where directionally cannot be determined, has shown that correctly perceived overweight can be predicted by lower self-esteem during adolescence, specifically among females (91).

The influence of a stigmatized appearance, real or perceived, during adolescence on self-esteem may increase the likelihood that individuals will engage in risky sexual behaviors because they believe doing so will avoid adverse relationship events (21), or they may enter relationships with power differentials associated with IPV victimization in order to feel accepted or perhaps to avoid social exclusion during the life course (47).

Extensions of objectification theory have suggested that associations between appearance and sexual behaviors may occur when an individual assumes that their appearance is the reason a potential or current partner is not interested in them (92). Particularly during adolescence, individuals may be encouraged to objectify their appearance and view their bodies in ways that they believe potential or actual partners view their bodies (19). Wingood et al. (2002) found that Black female adolescents who were more dissatisfied with their body image had a higher odds of engaging in sexual risk behaviors, perceiving that they had limited control in their sexual relationships, and fewer options for sexual partners (21). However, existing literature about how self-esteem is associated with sexual health is mixed. Literature about self-esteem and sexual health is often restricted to adolescence, and therefore, not generalizable to young adulthood. Ethier et al. (2006) found that lower self-esteem predicted an increased likelihood of unprotected sex among a sample of sexually active Black adolescent females at the six-month follow-up (93). Also using a sample of sexually active Black adolescent females, Salazar et al. (2005) did not find a statistically significant association between self-esteem and current STD status, but found that when

compared with lower self-esteem, higher self-esteem significantly predicted protective behaviors like greater confidence in using condoms (94). The authors of these studies state that the analyses could not explain causal mechanisms between self-esteem and sexual risk behaviors due to the temporality of data collection.

Other research suggests that there is an inverse association between self-esteem and risk of mistreatment in intimate relationships. Foshee et al. (2004) found in bivariate analyses that lower self-esteem predicted physical partner violence victimization among adolescent males and sexual dating violence among adolescent females (95). However, in multivariate analyses, self-esteem was a statistically significant predictor only among males. Another study found that self-esteem played a role in relationship investment among a sample of college aged females who reported abuse in their current relationship (96). The authors found that higher self-esteem was associated with women's perceptions that they have higher quality alternative partners, which in turn was associated with a lower level of relationship commitment, and subsequent higher likelihood of a terminated relationship at the end of the 10 week follow-up period.

In this dissertation it is hypothesized that, given the stigma associated with overweight BMI, imposed from others or self-imposed, and heightened appearance concern during adolescence, a sensitive period in the life course, those with a measured overweight BMI and those who perceive themselves to be overweight during adolescence may be susceptible to experiencing lower self-esteem and ultimately experience negative young adult health outcomes. Stated differently, in Paper 1, it is hypothesized that measured overweight BMI and self-perceived overweight will be associated with elevated odds of testing positive for one or more of the three STDs included in the Add Health urine test, and that such associations would be due to lowered adolescent self-esteem and a subsequent increase in sexual risk taking during

young adulthood. In Paper 2, measured overweight BMI and self-perceived overweight will be associated with increased odds of reporting IPV victimization due to lowered adolescent self-esteem. Specifically, it is the experiences related to overweight as a condition, either measured or self-perceived, and its subsequent effect on self-esteem during adolescence that are hypothesized to influence young adult health. Therefore, the hypothesized pathway should not be conceptualized as blaming the victim, but rather as an exploration of the life experiences of populations that research has found to be disproportionately vulnerable to stigma and negative health outcomes, and for whom weight stigma may be exacerbated by the social context of adolescence.

CHAPTER 3: Adolescent Overweight Body Mass Index and Self-Perceived Overweight: Do They Predict Sexually Transmitted Disease Status During Young Adulthood?

Introduction

Research has not explored how overweight BMI or self-perceived overweight during adolescence influence young adult sexual health. However, it is important to fill this literature gap because adolescence is a period in the life course when appearance is salient and plays a role in intimate partnering. During an important developmental time like adolescence, these characteristics and perceptions could have long-term effects on sexual health.

Nevertheless, research focusing on weight-related factors and adult STD outcomes has not considered the developmental significance of adolescence and its potential long-term influence on adult sexual health (23, 24). Other research has considered the influence of youth factors like age at first intercourse, partner age during adolescence, and adolescent family structure on young adult sexual health (12-14). Some research suggests that there is an association between BMI, self-perceived weight, and sexual health. However, findings vary depending on sampling and type of risk-taking examined. Two studies using the Youth Risk Behavior Surveillance System (YRBS) have found associations between BMI and sexual risk behaviors during adolescence. One YRBS study using only females, found that among Blacks, those who perceived themselves as overweight rather than about the right weight had higher odds of having four or more lifetime partners (26). In the same study, Whites who overestimated their weight, rather than correctly perceiving their weight, had lower odds of using a condom at last sex. Although BMI estimates become unstable at greater than

the 99th percentile of the growth charts, thus rendering the findings subject to criticism, the other study using YRBS data found that adolescent females with a BMI greater than or equal to the 99th percentile have higher odds of having used alcohol or drugs before last intercourse when compared to those with a BMI between the 5th and 84th percentile (27). Another small sample study by Wingood et al. (2002) found that girls between the ages of 14 and 18 with low levels of body satisfaction had higher odds of having unprotected vaginal sex in the last six months and never using condoms in the last 30 days (21).

Findings among adults are mixed. A study of college students found that women with an overweight or obese BMI had higher odds of being intoxicated at last intercourse than their counterparts with a normal BMI, but did not find an association between body image satisfaction and high-risk sexual behaviors (29). One study using a nationally representative sample of adult females (24), and another using an adult sample containing both sexes (23), did not find a relationship between BMI and STD outcomes. However, a small sample study of post-partum women (ages 14-25) found an inverse association between BMI and STD status (25).

These studies show that associations between BMI, body image, and STDs vary with sampling and the outcome of interest. The studies also reveal several literature gaps. First, most research focusing on weight-related factors and adult STD outcomes has not considered the developmental significance of adolescence and its potential longitudinal influence on adult sexual risk behaviors. Yet, adolescence is a developmentally significant time period to consider in such an investigation. Additionally, most existing research about the association between BMI or body image, broadly defined, and sexual health restricts samples to females. However, it is important to investigate outcomes in males, because they also experience weight stigma in the form of teasing during adolescence and receive cultural messages conveying an unrealistic

appearance (17, 59). The current study seeks to fill gaps in the current literature and answer the following research questions: First, are measured overweight BMI and self-perceived overweight during adolescence associated with testing positive for one or more of three STDs (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) in young adulthood? Second, are misperceived overweight and correctly perceived overweight during adolescence associated with testing positive for one or more of three STDs (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) in young adulthood? In addition, are these associations different for males and females, and non-Hispanic Whites and non-Hispanic Blacks? This study also explores whether adolescent self-esteem mediates the association between adolescent overweight, as indicated by BMI or self-perceptions, and sexual risk behaviors in young adulthood, and whether young adult sexual risk behaviors mediate the association between adolescent self-esteem and STD status in young adulthood. A subset of respondents enrolled in the National Longitudinal Study of Adolescent Health is used to explore these associations.

Methods

Data and Sample

Data are from the National Longitudinal Study of Adolescent Health (Add Health) Waves 1, 2, and 3 contractual data sets. Add Health is a population-based prospective cohort study; with a sample representative of adolescents who were enrolled in the 7th-12th grades in the 1994-1995 school year. Wave 1 data were collected in 1994 and 1995 (response rate=79.0%). Approximately 90,000 students in grades 7-12 completed questionnaires in schools. Additionally, 20,745 of students listed on the schools' rosters were selected for in-home interviews. Wave 2 interviews were conducted in 1996 with all individuals interviewed at Wave 1 except those who were in the 12th grade at Wave 1 and were not in the genetic sample (response rate=88.6%). The 14,738 individuals who

completed Wave 2 in-home questionnaires were in grades 8-12. In 2001 and 2002, Wave 3 interviews were conducted with 15,197 respondents who were between the ages of 18 and 26 at the time (response rate=77.4%). At all waves, questions about sensitive information like sexual activity were self-administered using computer-assisted self-interviewing (CASI) technology. Other information about the design of Add Health is documented elsewhere (97).

The present analytical sample consists of 3,047 respondents (1,278 males and 1,769 females). A number of eligibility criteria were applied (see Appendix 1 for detailed information about the construction of the analytic sample). First, because combining individuals within the underweight and normal BMI range during adolescence would not create a meaningful referent group for the analyses assessing misperceived overweight; individuals with an underweight BMI at Wave 2 were excluded from the sample. To create a meaningful referent group, those who perceived themselves as very or slightly underweight at Wave 2 are also excluded.

Individuals with zero vaginal intercourse partners in the past 12 months were also excluded from the analytic sample. By questionnaire design, in Wave 3, respondents who had no vaginal sex partners in the last 12 months were not asked about condom use and partner STD history. Further, respondents were excluded from the analytic sample if they did not have a valid Wave 3 cross-sectional weight, were pregnant at Wave 2 or Wave 3, were virgins at Wave 3, were in a same-sex relationship at Wave 3, were missing information on relationship type (marriage, cohabiting, dating) at Wave 3, or were missing values on any of the covariates of interest.

In Wave 3 of Add Health, urine samples were requested from all respondents. The samples were analyzed for the presence of *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*. Of those followed from Wave 1, six percent

refused to provide a urine sample and 19% could not be located to participate (98).

Overall, test results were available for 87.6% of Wave 3 participants (98).

Because the analyses were stratified by gender, race within gender, and measured BMI at Wave 2 within gender and race, small cell sizes only allowed for the inclusion of Non-Hispanic Whites and Non-Hispanic Blacks. Overall, there was a substantial loss of the sample because individuals who were seniors in high school at Wave 1 were not interviewed at Wave 2, but were interviewed at Wave 3. These individuals were missing on measured height and weight at Wave 2 and excluded from the analytical sample. Although self-reported height and weight at Wave 1 can be used to calculate BMI and classify individuals as having an obese BMI in Add Health data (99), Wave 2 measured height and weight were used for additional accuracy.

Measures

Dependent Variable

The outcome of interest in this study is a positive test for one or more of three STDs included in the Wave 3 Add Health urine test. In this study, a respondent was coded as 1 (yes) if they tested positive for one or more of the STDs of interest even if they were missing a value on a test. A respondent was only coded as 0 (no) if they had a negative test for all three diseases.

Independent Variables

The independent variables of interest were measured overweight/obese BMI (hereafter overweight) at Wave 2 and self-perceived overweight at Wave 2. A BMI measure was created from Wave 2 height and weight measurements and then classified as overweight according to BMI percentile categories from the Centers for Disease Control and Prevention/National Center for Health Statistics 2000 reference curves (58). The final variable was dichotomous, coded as 0 if a respondent had a normal BMI (greater than or equal to the 5th percentile and less than the 85th percentile), or 1 if a

respondent was overweight/obese (greater than or equal to the 85th percentile). At Wave 2 respondents were asked: “How do you think of yourself in terms of weight?”

Categorical response choices were: very underweight, slightly underweight, about the right weight, slightly overweight, very overweight. Responses were dichotomized with 0 indicating self-perceived “about the right weight” and 1 indicating self-perceived slightly/very overweight.

Socioeconomic and Demographic Characteristics

Demographic characteristics from Waves 1, 2, and 3 were included as control variables. A continuous variable for respondent age at Wave 2 was constructed by subtracting date of birth reported at Wave 2 from the Wave 2 interview date. The respondent’s race was classified as Non-Hispanic White or Non-Hispanic Black based on Wave 1 self-reported race and ethnicity. Cognitive ability has been associated with adolescent sexual behaviors, so statistical models include a continuous variable based on the Wave 1 Add Health Picture Vocabulary Test Score (PVT Score), a measure of oral vocabulary based on a modified Peabody Picture Vocabulary Test (100).

A dichotomous variable was constructed indicating the respondent’s family structure as reported at Wave 1. Any two-parent household was coded as 1 and all others were coded as 0. The non-two parent group included those raised in single parent households. Respondents’ parents’ highest level of education reported at Wave 1 was used as a proxy for socioeconomic status. Some college/vocational school or high school degree or higher was coded as 1, and less than a high school degree was coded as 0. The variable was based on the parents’ self-reported education level. If a parent’s response was missing, then the adolescent’s report of their parents’ education level was used. If a respondent lived with both parents, the highest level of education in the household was used.

A dichotomous variable indicating overweight/obese BMI at Wave 3 was included to control for appearance during young adulthood. Young adulthood measured BMI was calculated with the following formula: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$. Those with a BMI less than 25 were coded as 0 indicating normal/underweight during young adulthood, and those with a BMI greater than or equal to 25 were coded as 1 to indicate overweight/obese. Using the respondents' relationship history reported at Wave 3, respondents were coded as 0 indicating currently in an intimate relationship of any type (dating, cohabitation, or marriage) or 1 indicating not currently in any relationship of these types.

Potential Mediator: Adolescent Self-Esteem

A continuous self-esteem variable was created by summing responses to the six Rosenberg Self-Esteem scale questions that were asked at Wave 2. Higher scores indicate higher self-esteem levels because responses were reverse coded.

Potential Mediators: Sexual Risk Behaviors during Young Adulthood

The mediating properties of the following sexual risk behaviors measured at Wave 3 were of interest: the proportion of the time the respondent used condoms out of all the times that he/she had sexual intercourse in the last 12 months (none, some, half, most of the time or all of the time); if he/she had four or more partners in the last 12 months (yes/no); and if he/she had intercourse with a partner who had a history of STDs in the last 12 months (yes/no).

Analysis

All models were stratified by gender and race within gender because 1) associations between overweight BMI, self-perceived overweight, and well-being outcomes are likely to vary by race and gender and 2) there are racial disparities in STD status between Non-Hispanic Whites and Non-Hispanic Blacks. We used a series of

logistic regression models to examine the relationship between measured adolescent BMI, adolescent self-perceived weight, and young adulthood STD status.

The main hypotheses will be addressed in two ways because BMI and self-perceived weight are correlated. First, **Model 1** examines the unadjusted relationship between measured adolescent BMI and young adulthood STD status. Then, in **Model 2**, demographic and socioeconomic proxy controls (adolescent family structure, age at Wave 2, BMI at Wave 2, intimate relationship status at Wave 3, parent education level at Wave 1, and Add Health PVT Score at Wave 2) are added to the model that contains measured adolescent BMI. **Model 3** examines the relationship between adolescent self-perceived overweight and young adulthood STD status while controlling for measured adolescent BMI. Measured BMI is controlled for in the assessment of self-perceived weight to represent potential social vulnerability to weight stigma and provide an objective assessment of what informs self-perceptions and the perceptions of others during adolescence. **Model 4** contains measured adolescent BMI and self-perceived weight, as well as socioeconomic proxy and demographic controls. Bivariate models examining the association between self-perceived weight and STD status, as well as a fully adjusted model with self-perceived weight as the main variable of interest were run when the analytic sample was stratified by measured adolescent BMI (normal and overweight/obese) to assess the effects of correctly perceived overweight and misperceived overweight at Wave 2 on young adult STD status. These models were also stratified by gender and race within gender.

Steps suggested by Barron and Kenny (1986) were used to assess mediation (101). The most conservative version of this approach requires the association between the primary predictor of interest and the primary dependent variable of interest to be statistically significant for mediation to be explored. Two potential mediated pathways were of interest: 1) the ability of adolescent self-esteem to mediate the association

between measured BMI or self-perceived weight during adolescence and each of the young adulthood sexual risk behaviors and 2) the ability of each young adulthood sexual risk behavior to mediate the association between adolescent self-esteem and STD status during young adulthood.

As cell sizes allowed, potential mediators were assessed when data were stratified by gender, race within gender, measured adolescent BMI within gender, and measured adolescent BMI within each race for each gender. All analyses were conducted with Stata 12. Survey commands were used to accommodate the complex survey design of Add Health, and sampling weights were applied. A significance level of $p < 0.05$ was applied for all analyses.

Results

Descriptive Analyses

Over half of males (64.77%) and females (74.25%) had a measured adolescent BMI within the normal range (Table 1). More females (41.71%) perceived themselves as overweight/obese during adolescence than males (26.44%). Similar percentages of males (5.20%) and females (7.07%) tested positive for one or more of the three STDs of interest during young adulthood. Regarding young adult sexual risk behaviors in the last year: 10.46% of females and 4.94% of males had sex with a partner with a history of STDs; 81.23% of females and 74.60% of males used condoms inconsistently or never; and 8.15% of females and 14.77% of males reported having four or more partners. At Wave 3 over half of male and female respondents in the analysis sample were currently in an intimate relationship. At Wave 2, the average level of self-esteem for males was 26.1 (range: 6-30) and for females it was 24.9 (range: 8-30). Over half of males and females lived in households with two parents at Wave 1. At Wave 2, the average age was approximately 16 years old for males (16.6) and females (16.5). The average Wave 2 PVT score was 103.6 for males (range: 14-133) and 102.7 for females (range: 17-

138). The PVT scores are standardized (mean= 100 and standard deviation=15).

Analysis Stratified by Sex

Among males, in bivariate analyses there was not a statistically significant association between measured overweight BMI at Wave 2 and testing positive for one or more of the three STDs of interest during young adulthood (Table 2). When controlling for measured overweight BMI, there was not a statistically significant association between self-perceived overweight at Wave 2 and testing positive for one or more of the STDs. Measured BMI and self-perceived overweight during adolescence did not achieve statistical significance when the socioeconomic proxy and demographic factors were added (Table 2). In adjusted models, being non-Hispanic Black and older at Wave 2 were associated with a statistically significant higher odds of testing positive for an STD. However, the confidence interval for the race variable is wide, requiring careful interpretation of the odds ratio. Not being in a current intimate relationship (i.e., not in a current marriage, current cohabitation, or current dating relationship) at Wave 3 was associated with a statistically significant lower odds of testing positive for one or more of the STDs examined in the Wave 3 urine test.

Among females, in bivariate analyses, there was not a statistically significant association between measured overweight BMI and STD status during young adulthood (Table 3). There was also not a statistically significant association between adolescent self-perceived overweight and young adulthood STD status when controlling for adolescent measured overweight BMI. After the addition of a socioeconomic proxy and demographic controls, measured overweight BMI and self-perceived overweight during adolescence remained statistically insignificant. In Models 2 and 4, being non-Hispanic Black was associated with a statistically significant higher odds, and having a parent with a high school education or higher with a statistically significant lower odds of testing positive for an STD at Wave 3. However, the confidence interval for the race variable

was wide, requiring careful interpretation of the odds ratio.

Analysis Stratified by Race and Sex Simultaneously

Among non-Hispanic White (Table 4) and non-Hispanic Black (Table 5) males, there was not a statistically significant association between measured overweight BMI during adolescence and the STD outcome in unadjusted models. In addition, within both groups, self-perceived overweight during adolescence was not associated with the STD outcome when controlling for measured overweight BMI at Wave 2. Neither measured BMI nor self-perceived weight was significantly associated with STD status in young adulthood in fully adjusted models in either racial group. Among non-Hispanic White males, age at Wave 2 was associated with higher odds of testing positive for an STD during young adulthood, and not being in a current intimate relationship at Wave 3 was associated with decreased odds of testing positive for an STD during young adulthood in adjusted models. Overweight BMI at Wave 3 was associated with lower odds of testing positive among non-Hispanic Black males in adjusted Models 2 and 4.

Among non-Hispanic White (Table 6) and non-Hispanic Black (Table 7) females, measured overweight BMI was not associated with testing positive for an STD. In all models, among non-Hispanic White and non-Hispanic Black females, self-perceived overweight was not significantly associated with the STD outcome. For both races, when controls were added, neither measured BMI nor self-perceived weight was associated with the STD outcome. Not currently being in any type of intimate relationship at Wave 3 increased the odds of testing positive for one or more of the three STDs of interest among non-Hispanic White females in adjusted models (Table 6: Odds Ratio [OR]=2.28, CI:1.12-4.64) and (Table 6: OR:2.27, CI:1.11-4.63). None of the control variables significantly predicted a positive STD test among non-Hispanic Black females.

*Association With Correct Overweight Perceptions and Misperceived Overweight
at Wave 2*

Among males, correct overweight perception during adolescence was associated with lower odds of testing positive for an STD during young adulthood in the unadjusted model (Table 8: OR=0.22, CI: 0.05-0.96). However, the association was not statistically significant in the adjusted model. Misperceived overweight was not associated with STD status in unadjusted or adjusted models. Being non-Hispanic Black was associated with higher odds of having a positive STD test among males who had a normal or overweight measured BMI during adolescence. However, the confidence interval for the race estimate was wide, indicating a need for careful interpretation.

When stratified by race, correct overweight perception was associated with lower odds of an STD diagnosis at Wave 3 among non-Hispanic Black males in the unadjusted model (OR=0.11, CI: 0.01-0.91), but not in the adjusted model (Table 10). Misperceived overweight did not achieve statistical significance in adjusted or unadjusted models. Due to the small number of non-Hispanic White Males with an STD, adjusted models estimating the association between self-perceived weight and STD status do not have a meaningful interpretation (Table 9).

When females were pooled by race, there was not a statistically significant association between correct overweight perception and weight overestimation during adolescence with the STD outcome in the unadjusted and adjusted models (Table 11). Among females who had a measured overweight BMI at Wave 2, not being in an intimate relationship at Wave 3 was associated with higher odds, and being overweight at Wave 3 was associated with lower odds of testing positive for an STD of interest during young adulthood. Among overweight non-Hispanic White (Table 12) and non-Hispanic Black females (Table 13) correct overweight perception and weight overestimation were not significantly associated with the STD outcome. Among non-

Hispanic Black females who had an overweight BMI at Wave 2, age was significantly and inversely associated with testing positive for an STD. The small number of non-Hispanic White females who had a measured overweight BMI at Wave 2 and who had an STD at Wave 3 yielded wide confidence intervals, preventing meaningful interpretation of the results for Models 3 and 4 (Table 12).

Mediation by Self-Esteem During Adolescence and Sexual Risk Behaviors During Young Adulthood

There was not a statistically significant association between measured BMI nor self-perceived weight during adolescence and STD status during young adulthood in adjusted models. Therefore, the hypothesized associations were not candidates for mediation analyses.

Discussion

This study explores associations between measured overweight BMI and self-perceived overweight during adolescence and young adult STD status. Adjusted results show that there is not a statistically significant association between measured overweight BMI, self-perceived overweight, correct overweight perception, or misperceived overweight during adolescence and testing positive for an STD of interest during young adulthood. This finding held among both genders, and among non-Hispanic Whites and Blacks of both genders.

Lack of a statistically significant association between measured overweight BMI and STD outcomes in adjusted models is consistent with previous research utilizing samples of adults (23, 24). Our null findings may reflect that the transition to young adulthood can be accompanied by an increased acceptance of one's weight. It has been hypothesized that maturity, changes in peer norms, or freedom from social controls of high school may change individuals' attitudes towards their appearance as they enter young adulthood (102). Subsequently, this increased acceptance may nullify any

associations between overweight BMI, self-perceived overweight, and sexual risk behaviors that have been identified in other research with adolescent samples (21, 26). It is also possible that superficial concerns that can dictate partner selection during adolescence, like popularity and socially esteemed appearance, may decline during the transition to young adulthood as individuals seek more meaningful and monogamous relationships or focus on status indicators other than appearance (e.g., income and education). As suggested by the theory of Emerging Adulthood, during the transition from adolescence to young adulthood individuals often begin seeking more meaningful and emotionally intimate relationships (103). In the context of such relationships, the associations between appearance concerns and sexual risk behaviors from adolescence may not carry forward due to partner selection.

When data from our sample were pooled by race, non-Hispanic Blacks had higher odds of testing positive for one or more of the three STDs during young adulthood. This finding is consistent with surveillance trends (1). Lack of a statistically significant association between measured BMI and self-perceived weight during adolescence and STD status during young adulthood among both races could indicate that despite racial differences in body size preference (104) and self-perceived weight (105), higher BMI and self-perceived weight during adolescence may not have differential implications for sexual health among Whites or Blacks during young adulthood. To date, the literature is mixed. Some studies have found that body image is associated with risky sexual behaviors among Black adolescents (21, 26). However, one study found that measured overweight BMI is associated with risky sexual behaviors among White, but not Black, adolescent females (28). The ability of the present study to further explore how race influences the associations of interest is limited because Add Health lacks measures of racial identity and socialization, which are factors that can influence body image (106). Research has found that Black females with a less positive

ethnic identity have greater body dissatisfaction (21), and that racial socialization (engaging in activities that promote cultural awareness and pride) is positively associated with positive social self-image among Black girls with larger body sizes (107). Examining the moderating effects of ethnic identity and racial socialization may reveal different results.

Mediation analyses were not rigorously pursued because the main hypothesized association was not statistically significant. However, in additional analyses we found that, among females of both races, self-perceived overweight was inversely associated with self-esteem during adolescence when controlling for adolescent BMI and socio-demographic factors (Appendix 1: Table 29). The inverse association was also statistically significant among non-Hispanic White, but not non-Hispanic Black males (Appendix 1: Table 28). This finding demonstrates some support for our hypothesized pathway informed by objectification theory regarding the association between perceived appearance and self-esteem during adolescence. However, the self-perceived weight and self-esteem measures are from Wave 2, which prevents an understanding of the directionality of the association. Other cross-sectional research using self-esteem as a predictor of self-perceived weight during adolescence has also found inverse associations, but could not determine directionality due to the temporality of the measures (91). Additional research is needed to understand directionality or perhaps reciprocity in the association between overweight, as indicated by BMI or self-perceived, and self-esteem during adolescence.

Strengths and Limitations

A strength of this study is that the analytic sample includes males. Previous research in this area has been limited to females (21, 25, 26, 28). Further, we used a self-perceived overweight measure rather than a global measure of body image or body satisfaction. However, this study has several limitations.

First, sexual risk behavior reports may not be accurate because they address behavior over one year, and like all self-report measures of sexual behavior, their accuracy cannot be tested. Secondly, the Add Health sample at Wave 2 was smaller than Wave 3 by design. Therefore, older individuals were excluded from the analytical sample because they lacked a Wave 2 BMI value, likely reducing statistical power. Excluding those with perceived underweight BMI due to the need to create a meaningful referent group limits the generalizability of these findings. The exclusion of those with a slightly underweight perception at Wave 2 did not create substantive differences in the sample composition with regards to race, STD status, parent education, or family structure (see Appendix 1, Table 30). The only notable significant difference was that a greater proportion of males and females who perceived themselves to be slightly underweight at Wave 2 had a normal measured BMI than an overweight/obese BMI at Wave 2 and Wave 3.

Third, results can only be generalized to individuals reporting opposite sex intimate relationships at Wave 3. Individuals reporting same sex partners at Wave 3 were excluded from the sample due to small cell sizes. However, research has revealed associations between BMI, body image, and sexual behaviors among limited samples of sexual minority adult men (108, 109). More research is needed to explore the role of weight and body image in sexual minority populations. Such efforts should consider the nuances of appearance norms in gay and lesbian communities and experiences of sexual minority adolescents related to intimate relationships. Fourth, the Add Health STD measure reflects current infection. It is possible that those engaging in risky behaviors did not test positive because they were currently undergoing treatment or were more likely to get tested and treated due to their behaviors. Considering a history of STDs over a longer time period may have yielded different results. Also, HPV is one of the most common STDs among people ages 15-24 (110). However, HPV and other

STDs that disproportionately affect young adults were not included in the Add Health STD urine test. It is possible that measured adolescent BMI and self-perceived weight are associated with these excluded STDs. More research is needed on the associations of interest in this paper using a wider variety of STD outcomes.

Overall, findings of this study must be interpreted carefully. Self-perceived weight as defined in this study is not a measure of “negative body image.” It cannot be assumed that the two concepts are correlated, or that “overweight BMI” indicates “body dissatisfaction.” There are many ways to measure and conceptualize body image including in terms of affect, perception, mental evaluation, and worry about body size (111). Other studies also support using body image measures specific to the context of sexual intimacy, or a state measure of body image, to fully understand its association with sexual behaviors (112, 113). The Body Exposure during Sexual Activities Questionnaire has been developed for such purposes. Therefore, in this study, some degree of measurement error may be associated with the Add Health weight perception measurement and the theoretical constructs.

This study contributes to the literature about measured overweight BMI, self-perceived overweight, and sexual health. Results document that measured adolescent overweight BMI and self-perceived overweight are not associated with STD status during young adulthood. The findings from this paper indicate that while associations between BMI and/or self-perceived weight may influence sexual risk behaviors during adolescence, they do not ultimately influence STD status, at least those tested here, during young adulthood. Therefore, it may be important for comprehensive sexual health education curricula and health promotion efforts to address associations between appearance and sexual risk behaviors among adolescents throughout the BMI continuum and with a variety of weight perceptions. Given that STD rates peak during young adulthood, it may also be important for curricula to emphasize continued STD

testing throughout the life course, how to access testing and treatment during young adulthood, and how to establish monogamous and meaningful relationships during the transition to young adulthood. Some research has shown that condom use declines when young adults enter more committed relationship types like cohabitation (114). Further, that young adults decrease condom use in relationships because they trust their partner or incorrectly estimate the prevalence of STDs in their sexual network (115, 116).

Weight stigma and objectification are persistent in American culture. Future research should explore the longitudinal effects of a diversity of body image measures on sexual health as well as additional mediating factors. As cultural norms about body image evolve and the prevalence of adolescent overweight remains high, it will be important to maintain an understanding their role in sexual health.

Chapter Three Tables

TABLE 1: Percentage distribution of the analytic sample from the National Longitudinal Study of Adolescent Health, by gender unweighted n (Weighted %), Paper 1

	Males N=1,278	Females N=1,769	Full Sample N=3,047
Race			
Non-Hispanic White	975 (82.67%)	1,344 (83.85%)	2,319 (83.30)
Non-Hispanic Black	303 (17.33%)	425 (16.15%)	728 (16.70)
STD Status (Wave 3)			
Negative	1,209 (94.80%)	1,627 (92.93%)	2,836 (93.78)
Positive	69 (5.20%)	142 (7.07%)	211 (6.22)
Family Structure (Wave 1)			
Other	323 (23.25%)	510 (26.56%)	833 (25.04)
Two Parent	955 (76.75%)	1,259 (73.44%)	2,214 (74.96)
Relationship Status (Wave 3)**			
Married, Cohabiting, or Dating	879 (68.10%)	1,397 (79.42%)	2,276 (74.22)
Not In a Relationship	399 (31.90%)	372 (20.58%)	771 (25.78)
BMI (Wave 2)**			
Normal	847 (64.77%)	1,297 (74.25%)	2,144 (69.90)
Overweight/Obese	431 (35.23%)	472 (25.75%)	903 (30.10)
BMI (Wave 3)**			
Underweight/Normal Weight	530 (41.36%)	970 (56.35%)	1,500 (49.47)
Overweight/Obese	748 (58.64%)	799 (43.65%)	1,547 (50.53)
Self-Perceived Weight (Wave 2)**			
About Right	957 (73.56%)	1,039 (58.29%)	1,996 (65.30)
Slightly/Very Overweight	321 (26.44%)	730 (41.71%)	1,051 (34.70)
Four or More Partners In Last 12 Months (Wave 3)**			
No	1,101 (85.23%)	1,637 (91.85%)	2,738 (88.81)
Yes	177 (14.77%)	132 (8.15%)	309 (11.19)

Condom Use In Last 12 Months (Wave 3)**

Inconsistently/Never	956 (74.60%)	1,436 (81.23%)	2,392 (78.19)
All of The Time	322 (25.40%)	333 (18.77%)	655 (21.81)

Sex with a Partner with a History of STDs in Last 12 Months (Wave 3)**

No	1,202 (95.06%)	1,578 (89.54%)	2,780 (92.08)
Yes	76 (4.94%)	191 (10.46%)	267 (7.92)

Parent Education (Wave 1)

Less than High School	109 (9.40%)	210 (11.98%)	319 (10.79)
High School or Higher	1,169 (90.60%)	1,559 (88.02%)	2,728 (89.21)

**p<0.05, **p<0.01*

TABLE 2: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and STD status during young adulthood, males (n=1,278)

	Model 1 BMI Unadjusted		Model 2 BMI+Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception+Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2					0.34	[0.11,1.02]	0.53	[0.18,1.57]
Overweight BMI W2	0.50	[0.23,1.08]	0.72	[0.32,1.62]	0.76	[0.29,1.99]	0.86	[0.35,2.08]
Non-Hispanic Black Age W2			6.60**	[2.80,15.53]			6.33**	[2.74,14.69]
Overweight BMI W3			1.28**	[1.07,1.53]			1.27**	[1.06,1.53]
No Intimate Relationship W3			0.50	[0.24,1.01]			0.53	[0.25,1.09]
Two Parent Household			0.53*	[0.29,0.97]			0.55*	[0.31,0.98]
PVT Score			2.16	[0.88,5.29]			2.12	[0.87,5.20]
Parent Education High School+			0.98	[0.96,1.01]			0.98	[0.96,1.01]
			0.78	[0.29,2.08]			0.79	[0.29,2.90]

* $p < 0.05$, ** $p < 0.01$

TABLE 3: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and STD status during young adulthood, females (N=1,769)

	Model 1 BMI Unadjusted		Model 2 BMI+Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception+Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight								
Perception W2					0.85	[0.53,1.37]	1.12	[0.68,1.84]
Overweight								
BMI W2	1.66	[0.96,2.85]	1.05	[0.55,2.01]	1.81	[1.00,3.31]	1.00	[0.52,1.90]
Non-Hispanic Black			6.60**	[3.95,11.02]			6.67**	[3.95,11.27]
Age W2			0.90	[0.78,1.04]			0.90	[0.77,1.04]
Overweight BMI W3			0.85	[0.49,1.48]			0.83	[0.47,1.46]
No Intimate								
Relationship W3			1.61	[0.98,2.67]			1.61	[0.97,2.68]
Two Parent Household			0.91	[0.59,1.39]			0.91	[0.59,1.39]
PVT Score			1.00	[0.98,1.01]			1.00	[0.98,1.01]
Parent Education								
High School+			0.46*	[0.23,0.89]			0.45*	[0.23,0.88]

* $p<0.05$, ** $p<0.01$

TABLE 4: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and STD status during young adulthood, non-Hispanic White Males (n=975)

	Model 1 BMI Unadjusted		Model 2 BMI + Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception+Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2					0.72	[0.21,2.45]	0.78	[0.21,2.96]
Overweight BMI W2	0.41	[0.13,1.31]	0.56	[0.18,1.75]	0.49	[0.13,1.84]	0.63	[0.19,2.04]
Age W2			1.45**	[1.14,1.86]			1.45**	[1.14,1.86]
Overweight BMI W3			0.54	[0.17,1.71]			0.55	[0.16,1.86]
No Intimate Relationship W3			0.37*	[0.14,0.94]			0.37*	[0.14,0.95]
Two Parent Household			1.66	[0.43,6.43]			1.66	[0.43,6.42]
PVT Score			0.98	[0.94,1.03]			0.98	[0.94,1.03]
Parent Education High School+			2.45	[0.30,20.22]			2.47	[0.29,20.74]

* $p < 0.05$, ** $p < 0.01$

TABLE 5: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and STD status during young adulthood, non-Hispanic Black Males (n=303)

	Model 1 BMI Unadjusted		Model 2 BMI+Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception+Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight PerceptionW2					0.23	[0.04,1.30]	0.31	[0.05,1.77]
Overweight BMI W2	0.60	[0.21,1.70]	0.99	[0.30,3.28]	0.85	[0.26,2.82]	1.19	[0.34,4.15]
Age W2			1.12	[0.87,1.45]			1.11	[0.87,1.43]
Overweight W3			0.41*	[0.19,0.92]			0.45*	[0.20,0.97]
No Intimate Relationship W3			0.75	[0.29,1.94]			0.80	[0.32,1.96]
Two Parent Household			2.77	[0.97,7.88]			2.68	[0.92,7.79]
PVT Score			0.98	[0.95,1.02]			0.98	[0.95,1.01]
Parent Education High School+			0.45	[0.13,1.51]			0.47	[0.14,1.55]

*p<0.05, **p<0.01

TABLE 6: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and STD Status during young adulthood, non-Hispanic White Females (n=1,344)

	Model 1 BMI Unadjusted		Model 2 BMI+Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception+Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight								
Perception W2					1.37	[0.74,2.53]	1.38	[0.67,2.87]
Overweight								
BMI W2	0.62	[0.22,1.74]	0.50	[0.13,1.86]	0.52	[0.19,1.42]	0.44	[0.13,1.50]
Age W2			0.93	[0.76,1.13]			0.92	[0.75,1.12]
Overweight BMI W3			1.08	[0.51,2.29]			0.98	[0.43,2.23]
No Intimate								
Relationship W3			2.28*	[1.12,4.64]			2.27*	[1.11,4.63]
Two Parent Household			1.02	[0.46,2.30]			1.04	[0.45,2.39]
PVT Score			0.99	[0.97,1.01]			0.99	[0.97,1.01]
Parent Education								
High School+			0.40	[0.16,1.02]			0.40	[0.16,1.03]

* $p<0.05$, ** $p<0.01$

TABLE 7: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and STD Status during young adulthood, non-Hispanic Black Females (n=425)

	Model 1 BMI Unadjusted		Model 2 BMI+Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception+Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2					0.69	[0.37,1.26]	0.85	[0.43,1.68]
Overweight BMI W2	1.46	[0.82,2.59]	1.62	[0.83,3.16]	1.77	[0.93,3.36]	1.73	[0.80,3.73]
Age W2			0.86	[0.69,1.06]			0.87	[0.70,1.08]
Overweight BMI W3			0.74	[0.38,1.45]			0.76	[0.40,1.47]
No Intimate Relationship W3			1.11	[0.65,1.90]			1.12	[0.65,1.91]
Two Parent Household			0.80	[0.45,1.43]			0.80	[0.45,1.43]
PVT Score			1.01	[0.99,1.03]			1.01	[0.99,1.03]
Parent Education High School+			0.50	[0.20,1.21]			0.50	[0.20,1.25]

* $p < 0.05$, ** $p < 0.01$

TABLE 8: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and STD status during young adulthood, males, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave 2		Among Normal BMI at Wave2		Among Overweight at Wave 2		Among Overweight at Wave 2	
	Unadjusted (N=847)		Adjusted (N=847)		Unadjusted (N=431)		Adjusted (N=431)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2	0.59	[0.18,1.94]	0.80	[0.21,3.06]	0.22*	[0.05,0.96]	0.40	[0.09,1.79]
Non-Hispanic Black			6.99**	[2.20,22.22]			6.42**	[1.69,24.39]
Overweight BMI W3			0.44	[0.18,1.04]			1.35	[0.22,8.32]
Age W2			1.24	[0.98,1.57]			1.42*	[1.03,1.97]
No Intimate Relationship W3			0.56	[0.29,1.08]			0.58	[0.16,2.13]
Two Parent Household			2.16	[0.71,6.51]			2.19	[0.56,8.60]
PVT Score			0.99	[0.96,1.03]			0.98	[0.95,1.01]
Parent Education High School+			1.14	[0.36,3.59]			0.24	[0.04,1.30]

* $p < 0.05$, ** $p < 0.01$

Note: The estimate for self-perceived overweight among normal BMI individuals indicates misperceived overweight.

The estimate for self-perceived overweight among overweight BMI individuals indicates correct weight estimation.

TABLE 9: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and STD status during young adulthood, by adolescent BMI, non-Hispanic White Males

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave 2 Unadjusted (N=650)		Among Normal BMI at Wave2 Adjusted		Among Overweight BMI at Wave 2 Unadjusted (N=325)		Among Overweight BMI at Wave 2 Adjusted	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2	0.78	[0.19,3.24]	Model not interpretable due to small cell sizes		0.64	[0.10,4.33]	Model not interpretable due to small cell sizes	
Age W2								
Overweight BMI W3								
No Intimate Relationship W3								
Two Parent Household								
PVT Score								
Parent Education High School+								

* $p<0.05$, ** $p<0.01$

TABLE 10: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and STD status during young adulthood, by adolescent BMI, non-Hispanic Black Males (Normal BMI Wave 2 N=197, Overweight BMI Wave 2 N=106)

		Misperceived Overweight Models				Correctly Perceived Overweight Models			
		Among Normal BMI at Wave 2 Unadjusted (N=197)		Among Normal BMI at Wave2 Adjusted (N=197)		Among Overweight BMI at Wave 2 Unadjusted (N=106)		Among Overweight BMI at Wave 2 Adjusted (N=106)	
		OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight	Perception W2	0.55	[0.07,4.42]	0.60	[0.04,8.85]	0.11*	[0.01,0.91]	0.14	[0.01,1.47]
Age W2				0.98	[0.69,1.37]			1.83	[1.00,3.37]
Overweight BMI W3				0.34*	[0.14,0.82]			0.49	[0.07,3.59]
No Intimate	Relationship W3			0.73	[0.25,2.18]			2.04	[0.17,25.22]
Two Parent Household				3.36	[0.94,11.92]			1.87	[0.16,22.18]
PVT Score				1.00	[0.97,1.04]			0.97	[0.94,1.01]
Parent Education	High School+			0.47	[0.14,1.61]			0.16	[0.01,2.30]

* $p < 0.05$, ** $p < 0.01$

TABLE 11: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and STD status during young adulthood, females, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave 2 Unadjusted (N=1,297)		Among Normal BMI at Wave 2 Adjusted (N=1,297)		Among Overweight BMI at Wave 2 Unadjusted (N=472)		Among Overweight BMI at Wave 2 Adjusted (N=472)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2	0.92	[0.54,1.56]	0.96	[0.54,1.73]	0.72	[0.32,1.59]	2.55	[0.80,8.11]
Non-Hispanic Black No Intimate Relationship W3			4.15**	[2.11,8.17]			23.37**	[9.24,59.09]
Age W2			1.38	[0.67,2.82]			2.61*	[1.12,6.10]
Overweight BMI W3			0.98	[0.83,1.17]			0.66**	[0.50,0.87]
Two Parent Household			1.13	[0.68,1.87]			0.26*	[0.08,0.79]
PVT Score			0.73	[0.42,1.27]			1.46	[0.67,3.19]
Parent Education High School+			1.00	[0.98,1.02]			1.00	[0.97,1.04]
			0.50	[0.23,1.06]			0.35	[0.10,1.24]

* $p < 0.05$, ** $p < 0.01$

TABLE 12: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and STD status during young adulthood, by adolescent BMI, non-Hispanic White females

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave 2 Unadjusted (N=1,043)		Among Normal BMI at Wave 2 Adjusted (N=1,043)		Among Overweight BMI at Wave 2 Unadjusted (N=301)		Among Overweight BMI at Wave 2 Adjusted (N=301)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight Perception W2	1.32	[0.69,2.53]	1.19	[0.55,2.57]	2.54	[0.27,23.99]	23.36	[0.53,1031.40]
Age W2			0.97	[0.77,1.21]			0.52*	[0.27,0.99]
Overweight BMI W3			1.32	[0.70,2.49]			0.08*	[0.01,0.68]
No Intimate Relationship W3			1.87	[0.81,4.28]			10.17*	[1.51,68.66]
Two Parent Household			0.91	[0.37,2.25]			1.73	[0.31,9.51]
PVT Score			0.98	[0.96,1.01]			1.05	[0.97,1.12]
Parent Education High School+			0.48	[0.16,1.45]			0.12	[0.01,1.03]
* $p<0.05$, ** $p<0.01$								

TABLE 13: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and STD status during young adulthood, by adolescent BMI, non-Hispanic Black Females

		Misperceived Overweight Models		Correctly Perceived Overweight Models	
		Among Normal BMI at Wave2 Unadjusted (N=254)	Among Normal BMI at Wave 2 Adjusted (N=254)	Among Overweight Wave at 2 Unadjusted (N=171)	Among Overweight Wave at 2 Adjusted (N=171)
		OR 95%CI	OR 95%CI	OR 95%CI	OR 95%CI
53	Overweight Perception W2	0.42 [0.16,1.14]	0.49 [0.17,1.42]	0.96 [0.39,2.38]	1.73 [0.57,5.21]
	Age W2		1.00 [0.77,1.29]		0.68* [0.48,0.95]
	Overweight W3		1.03 [0.49,2.13]		0.44 [0.14,1.43]
	No Intimate Relationship W3		0.75 [0.24,2.28]		1.71 [0.72,4.06]
	Family Structure		0.54 [0.25,1.18]		1.28 [0.57,2.87]
	PVT Score		1.01 [0.98,1.05]		1.00 [0.97,1.03]
	Parent Education High School+		0.59 [0.21,1.65]		0.49 [0.13,1.83]
	* $p<0.05$, ** $p<0.01$				

CHAPTER 4: Adolescent Overweight Body Mass Index and Self-Perceived Overweight: Do They Predict Intimate Partner Violence Victimization During Young Adulthood?

Introduction

Adolescents with an overweight body mass index (BMI) are more likely to experience teasing and physical violence than their peers with lower BMIs, as well as experience weight teasing from family members (17, 18, 117). Overweight and obese BMI remain associated with interpersonal mistreatment throughout life. Adults with an overweight BMI have a higher odds of receiving hurtful comments from family members than their counterparts with a nonoverweight BMI, and overweight and obese adults report experiencing weight stigma (e.g. verbal comments) in employment settings and public places (47, 118).

Overweight teens who experience weight teasing have higher odds of engaging in unhealthy weight control behaviors (17). Females, but not males, who experience weight-related teasing during youth have significantly higher odds of receiving hurtful weight related comments from a significant other during young adulthood (47). Receiving hurtful weight comments during young adulthood has been found to mediate the association between being teased during adolescence and disordered eating behaviors during young adulthood (119).

Despite vulnerabilities to mistreatment among those with an overweight BMI in interpersonal contexts, conclusions are not consistent or clearly established about the role of weight bias and higher BMI in intimate relationships (37). To the author's knowledge, it is unknown if adolescent overweight BMI is associated with IPV during young adulthood. Studies among adolescents often focus on associations between

overweight BMI and sexual health and behaviors (26, 33). Among adults, the focus is often on how overweight BMI influences the likelihood of intimate partnerships like marriage (39, 40).

However, vulnerability to victimization may be increased within the context of intimate partnerships for several reasons. First, intimate relationships often involve meal preparation and food choice negotiation (120, 121). Comments made about dietary behaviors with the intention of motivating a person to lose weight for health reasons may be stigmatizing and hurtful (118). Also, differences in food preferences and perceived partner support for health-related behaviors are associated with relational conflict (22, 121). Secondly, intimate partners are a source of weight stigma and mistreatment (48, 118). Weight-related communication, verbal or non-verbal, within relationships may influence relationship power dynamics among those with a history of a higher BMI, whether measured or self-perceived.

Overall, the empirical association between BMI and IPV victimization remains unclear. Some studies suggest that there is not an association between BMI and IPV victimization among adults. For example, a study using the Hurt, Insult, Threat, Scream (HITS) tool and the Women Abuse Screening Tool (short version; WAST-Short) found in bivariate analyses that BMI did not significantly differ between IPV victims and nonvictims (43). Also, a nationally representative, population-based sample of middle-aged women who were asked if they had ever been in a violent intimate relationship found in univariate analyses that adulthood BMI was not a statistically significant predictor of experiencing IPV victimization (42). Lastly, a study using a sample from the 2005 Behavioral Risk Factor Surveillance System found that adult men and women who have ever experienced threats, sexual violence, and/or physical violence from a current or former intimate partner in their lifetime do not have higher odds of having a overweight/obese BMI when compared to those who have never experienced IPV (41).

In contrast, another study using a large Health Maintenance Organization sample found that women who reported any IPV during adulthood had a higher mean BMI than those who reported not experiencing any IPV victimization (44).

Other studies that focus on weight related interactions suggest that among adults, higher BMI is associated with non-physical mistreatment in intimate partnerships. Eisenberg et al. (2011) found that obese BMI classification during young adulthood is associated with greater odds of receiving hurtful weight related comments from a significant other among females and males in adjusted models (47). The authors also found that when compared with those who maintained their weight between adolescence and young adulthood, women who gained weight during that time period had higher odds of receiving hurtful weight related comments from their significant other. Another study of adults enrolled in a weight gain prevention intervention found that among the heaviest male and female participants, unspecified weight related mistreatment often came from spouses (48). Other research found that overweight women in partnerships with healthy weight men argue more than their non-overweight counterparts who have healthy weight male partners (22). However, none of these studies used established IPV measures like the Conflict Tactics Scale or measures pertaining to physical or sexual violence. Therefore, additional research is needed to explore the association between BMI and IPV victimization.

Little is known about associations between adolescent body image, broadly defined, and IPV victimization during young adulthood because the literature is fragmented across the life course, whereas studies use samples of only adolescents or adults. Research suggests that there is not an association between body image and IPV victimization during adolescence. For example, employing a sample of males and females from a longitudinal study of adolescents in rural public school systems, a study found that in adjusted models, those who experienced higher and lower levels of dating

violence victimization did not differ in body satisfaction/image (46). Another study found that among a sample of Black adolescent females, negative body image was not a statistically significant predictor of an initial episode of dating violence during a one year follow-up period in multivariate analyses (45). In contrast, a study of adolescent females found that experiencing both physical and sexual violence predicted increased odds of diet pill and laxative use in the last 30 days (122).

In addition to lacking measures from adolescence, research among adults often focuses on how relationship quality rather than IPV is associated with behaviors related to body image, like dieting. Two studies found that among adult coupled females, lower marital quality was positively associated with unhealthy dieting practices among wives (123). Other research has found that conflict increases the more mixed weight couples (combination of overweight and healthy weight individuals) eat meals together (22). Also, that communication about weight is associated with relationship satisfaction (51).

To our knowledge, associations between adolescent overweight BMI, adolescent overweight self-perception, and IPV victimization during young adulthood have not been examined. However, it is important to understand if overweight BMI and self-perceived overweight during adolescence can predict young adulthood IPV victimization.

Adolescence is an important life course period when appearance becomes important and expectations for intimate relationships are established. The simultaneity of these events often exposes individuals to social norms and gender stereotypes about associations between appearance and intimate partnering. During adolescence, it is common for individuals to receive appearance feedback from potential and actual partners as well as peers who comment about how physically attractive they may be to romantic partners (19). Experiencing or perceiving a stigmatized appearance like overweight BMI during a developmentally significant time period like adolescence may have implications for power differentials related to young adulthood IPV victimization.

Research about self-esteem predicting risk of mistreatment in intimate relationships is mixed (95, 124, 125). However, given associations between experiences with overweight BMI during adolescence (like teasing) and self-esteem, we hypothesize that self-esteem may serve as a mediator in the associations of interest.

It is important to understand antecedents of young adulthood IPV victimization because rates are highest during young adulthood when compared with other times during the life course (2). Additionally, gender and racial disparities in IPV victimization are pronounced. According to the National Intimate Partner and Sexual Violence Survey, approximately 35% of women and 28% of men have experienced physical or sexual violence by an intimate partner during their lifetime (11). In addition to being more likely to experience nonfatal IPV victimization, the odds of injury are higher for women when physical abuse is perpetrated by a man (10). Women are also more likely to experience intimate homicide than men (2). Further, the lifetime prevalence of intimate partner rape, physical violence, and/or stalking is higher among non-Hispanic Blacks than non-Hispanic Whites among both genders (11).

Lastly, research has shown that as overweight adolescents transition to adulthood, they receive less emotional support from family members as their BMI increases (50); overweight adults experience stigma in most other segments of society such as public places, the healthcare system, and employment settings (126, 127). Further, IPV victimization can result in fewer social support resources either out of fear of retaliation from a partner or the belief that IPV is a private matter (57, 128). These factors could indicate that individuals with a history of adolescent overweight BMI may need more support from community resources if they experience IPV during young adulthood.

The purpose of this study is to determine if measured adolescent overweight BMI and self-perceived overweight are associated with experiencing sexual violence, physical violence, and/or threats of violence in their current intimate relationship during young adulthood. Additionally, this study will examine if correct overweight perceptions and/or misperceived overweight during adolescence are associated with IPV victimization during young adulthood, and determine if self-esteem mediates the association. The associations of interest will be explored within gender and race.

It is hypothesized that measured overweight BMI and self-perceived overweight during adolescence will be associated with elevated odds of reporting IPV victimization during young adulthood. The study will contribute to the literature by exploring if adolescent measured overweight BMI, a risk factor for interpersonal mistreatment throughout the life course, is associated with IPV victimization during young adulthood. Also, findings could help determine if self-perceived overweight is an attitude that adolescent IPV prevention efforts should address.

Methods

This analysis uses data from Waves 1, 2, and 3 of the National Longitudinal Study of Adolescent Health (Add Health) contractual data set. Add Health is a longitudinal study of more than 20,000 respondents who were in grades 7-12 during the 1994-1995 school year. Wave 1 data were collected in 1994 and 1995 (response rate=79.0%). Respondents were interviewed again for Wave 2 in 1996 (response rate=88.6%). Wave 3 interviews were conducted between 2001 and 2002 when respondents were between the ages of 18 and 26 (response rate=77.4%). Additional information about Add Health's sampling procedures and its design is documented elsewhere (97). The analytic sample only includes Add Health respondents who were in a current marriage, cohabitation, or dating relationship when interviewed at Wave 3. Respondents were excluded from the sample if they were in a same-sex relationship at

Wave 3, were pregnant at Wave 2 or Wave 3, did not report a current intimate relationship at Wave 3, or were missing values on any of the covariates of interest. The final sample consists of 2,719 non-Hispanic White and non-Hispanic Black respondents (1,039 males and 1,680 females) who were currently in an intimate (dating, cohabitation, or marriage) relationship at Wave 3 (See Appendix 2 for detailed description of how the analytic sample was constructed).

Measures

In Wave 3, participants were asked the following questions about IPV victimization in the past 12 months: “How often has this partner insisted on or made you have sexual relations with (HIM/HER) when you didn’t want to?” “How often has your partner slapped, hit, or kicked you?,” and “How often has your partner threatened you with violence, pushed or shoved you, or thrown something at you that could hurt?.” A dichotomous variable indicates if a person experienced any type of the IPV mentioned above in their current intimate relationship at Wave 3. If they responded yes to any of the questions they were coded as 1, having experienced IPV victimization in their current intimate relationship in young adulthood, if they responded no to all three questions they were coded as 0, or not having experienced IPV victimization in their current intimate relationship.

Respondents’ height and weight were measured by Add Health interview staff at Wave 2. Using the height and weight measurements and the respondents’ gender and age at the time of the interview, BMI was calculated according to BMI percentile categories from the Centers for Disease Control and Prevention/National Center for Health Statistics 2000 reference curves (58). Then, a dichotomous variable indicating normal BMI classification (greater than the 5th and less than the 85th percentile) or overweight/obese BMI classification (greater than or equal to the 85th percentile) was created. Adolescent self-perceived weight was assessed at Wave 2. Respondents were

asked “How do you think of yourself in terms of weight?” Response choices were very underweight, slightly underweight, about the right weight, slightly overweight, and very overweight. In this study, responses were dichotomized to indicate if the respondent perceived themselves as about the right weight (0) or as overweight/obese (1).

Race was self-reported and respondents were classified as non-Hispanic White or non-Hispanic Black. Age at Wave 2 was a continuous variable calculated by subtracting the respondents’ birth date from the date of the interviews. Adolescent socioeconomic status was indicated by the highest level of education achieved by the respondents’ parents at Wave 1 (less than high school degree, high school degree/GED, vocational school or some college, college degree or higher). High school degree/GED served as the referent group. If the respondent was raised with two parents in the household at Wave 1, then the highest level of education achieved within the household was used in the analysis. Abuse before the sixth grade was a dichotomous variable (1=yes, one or more times to any of the questions and 0=never to all of the questions) based on the following questions asked at Wave 3: “How often had your parents or other adult care-givers slapped, hit, or kicked you?” and “How often had one of your parents or other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?” Also, a dichotomous variable indicating measured overweight/obese BMI at Wave 3 was included to control for appearance during young adulthood. Young adulthood BMI was calculated with the following formula: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$. Those with a BMI less than 25 were coded as 0, indicating normal/underweight, and those with a BMI greater than or equal to 25 were coded as 1 to indicate overweight/obese. In preliminary bivariate analyses, perceiving oneself as having a pubertal status younger than peers at Wave 2 was associated with IPV victimization at Wave 3 among males. Research has also found that advanced pubertal status is associated with IPV victimization during adolescence among

females (129). Therefore, self-perceived pubertal status was included as a control variable. In Wave 2, participants were asked “How advanced is your physical development compared to other boys/girls your age?” Response choices were: I look younger than most, I look younger than some, I look about average, I look older than some, and I look older than most. These categories were collapsed to older (most/some), average (referent), and younger (some/most).

Several variables were included to control for conditions of the respondents' current intimate relationship at Wave 3. A categorical variable indicating the type of current relationship (dating, cohabiting, or married (referent)) was included. To adjust for the inverse association between relationship duration and likelihood of experiencing IPV, a continuous variable for relationship duration (in years) was constructed by subtracting the Wave 3 interview date from the start date of the current relationship reported by the respondent. Age of the respondents' partner was also a control variable because it could influence power differentials related to relationship expectations, and is inversely associated with IPV perpetration (130). The respondents' answers to the question “Please indicate whether <partner> is older or younger than you?” was used to construct a categorical variable, and same age as the respondent was the referent group.

Adolescent self-esteem is the mediator of interest in this study. A continuous variable for the respondent's self-esteem was created by summing responses to the Rosenberg Self-Esteem scale (ranging from 1 to 5) that was administered at Wave 2. Responses to each of the six questions were reverse coded so that higher levels of agreement indicated higher levels of self-esteem.

Analysis

All models were stratified by gender as well as race within gender because associations between overweight BMI, self-perceived overweight, and well-being outcomes can vary by race and gender. The following logistic regression models were fit

for each stratified group. **Model 1** examines the unadjusted relationship between measured adolescent BMI and young adulthood IPV victimization. In **Model 2**, controls (parent education level, child abuse, age at Wave 2, pubertal status at Wave 2, BMI at Wave 3, and intimate relationship characteristics at Wave 3) are added to the model that only contains adolescent BMI. **Model 3**, examines the relationship between adolescent self-perceived overweight and young adulthood IPV victimization while controlling for adolescent measured BMI. Measured adolescent BMI is controlled for in the assessment of adolescent self-perceived weight to represent potential social vulnerability to weight stigma and provide an objective assessment of what informs self-perceptions and the perceptions of others. **Model 4** contains adolescent self-perceived and measured BMI, as well as controls.

Bivariate models examining the association between self-perceived weight and IPV, as well as a fully adjusted model with self-perceived weight as the main variable of interest were run when the analytic sample was stratified by measured adolescent BMI (normal and overweight/obese) to assess the effects of correctly perceived overweight and misperceived overweight at Wave 2 on young adult IPV experiences. Within each measured BMI category (normal and overweight) analyses were conducted when data were stratified by gender, as well as by race within gender.

The mediating properties of self-esteem were assessed using steps suggested by Barron and Kenny (1986) (101). According to this approach, mediation is plausible if there is a statistically significant association between the predictor of interest and the dependent variable of interest. Given that the main association was statistically significant, and as cell sizes allowed, mediation by self-esteem was assessed when data were stratified by gender, race within gender, and Wave 2 BMI status within gender, and Wave 2 BMI status within each race for each gender. All analyses were conducted with

Stata 12. Sampling weights and survey commands were applied to adjust for the complex design of Add Health.

Results

Description of Participants

Approximately 22% of males and 20% of females reported experiencing some type of IPV victimization during the last year in their current young adulthood intimate relationship (Table 14). Females (40.63%) were more likely than males (25.06%) to have overweight self-perceptions at Wave 2. The average relationship duration was 2.6 years for males and 2.9 years for females. Less than half of males (34.55%) and females (25.59%) had a measured overweight/obese BMI at Wave 2. The average age of males was 16.7 years, and the average age for females was 16.5 years at Wave 2. The average self-esteem score at Wave 2 was 26.1 for males (range: 11-30) and 25.1 for females (range: 8-30).

Stratification by Sex

Among males when pooled by race, measured adolescent BMI and self-perceived weight were not associated with IPV victimization in young adulthood in any model (Table 15). Among females when pooled by race, measured overweight BMI during adolescence was significantly associated with reporting IPV victimization during young adulthood in bivariate analyses (Table 16; Model 1: OR=1.66, CI: 1.21-2.28), and when only adolescent measured BMI and self-perceived overweight were included in the model (Table 16; Model 3: OR=1.77, CI: 1.19-2.62). When controlling for other factors, adolescent overweight BMI remained statistically significant (Table 16; Model 2: OR=1.41, CI: 1.00-1.98). There was not a statistically significant association between adolescent self-perceived overweight and IPV victimization at Wave 3 among females in any model.

Among males (Table 15) and females (Table 16), when pooled by race, being

non-Hispanic Black and having experienced child abuse were associated with higher odds of IPV victimization. However, among males pooled by race, when compared with marriage, dating was associated with higher odds of IPV victimization but cohabitation, did not achieve statistical significance. In contrast, among females pooled by race, when compared to marriage, dating was associated with lower odds, and cohabitation was associated with higher odds of IPV victimization. Among females, but not males, early pubertal timing (i.e., looking older than their peers), compared to average timing, was significantly associated with lower odds of reporting IPV victimization during young adulthood.

Stratified by Race within Sex

Neither measured BMI nor self-perceived weight during adolescence was associated with young adulthood IPV victimization among non-Hispanic White or non-Hispanic Black males in any models (Table 17). When compared to marriage, dating and cohabitation were associated with lower odds of IPV victimization among non-Hispanic White males, but a statistically significant association between relationship type and IPV victimization was not observed among non-Hispanic Black males. There was not a statistically significant association between relationship duration and IPV victimization among non-Hispanic White males. However, among non-Hispanic Black males, longer duration was associated with a statistically significant greater odds of IPV victimization (Table 17; Model 2: OR=1.35, CI: 1.17-1.56; Model 4: OR=1.35, CI: 1.17-1.56).

Among non-Hispanic White females, but not non-Hispanic Black females, measured adolescent overweight BMI was significantly associated with higher odds of young adulthood IPV victimization in the bivariate model (Table 18; OR=1.57, CI: 1.09-2.27) and the model that only included adolescent BMI and self-perceived weight (Table 18; OR=1.57, CI: 1.03-2.41). Neither adolescent measured BMI nor self-perceived weight was significantly associated with reporting IPV victimization among non-Hispanic

White, or non-Hispanic Black females in fully adjusted models. However, among non-Hispanic White, but not non-Hispanic Black females, when compared to marriage, dating was associated with a statistically significant lower odds, and cohabitation with higher odds of experiencing IPV victimization. Increased duration was also significantly associated with increased odds of IPV victimization among non-Hispanic White and non-Hispanic Black females.

Stratified by Adolescent BMI to Assess Correctly Perceived and Misperceived Overweight

Among males pooled by race (Table 19) and non-Hispanic White males (Table 20), adolescent misperceived overweight was significantly associated with higher odds of reporting young adulthood IPV victimization in bivariate models. However, the associations were not statistically significant after controlling for other factors. Misperceived overweight was not ever significantly associated with IPV among females when pooled by race (Table 22). Correct overweight perception during adolescence was not significantly associated with young adulthood IPV victimization in any bivariate models among either gender. Small cell sizes prevented meaningful interpretation of results in most models when data were stratified by gender, race, and adolescent BMI (Tables 20, 21, 23, and 24).

When compared with marriage, dating was associated with lower odds of IPV victimization among males regardless of adolescent BMI classification (Table 19). Among females, when compared to marriage, cohabitation was associated with higher odds of IPV victimization among those who had an adolescent overweight BMI (Table 22; OR=2.87, CI: 1.38-5.97) and those who had an adolescent normal BMI (Table 22; OR=1.93, CI: 1.24-2.99). Longer relationship duration was associated with higher odds of IPV victimization among males who had a normal adolescent BMI (Table 19; OR=1.16, CI: 1.04-1.29), but not among those who had an overweight adolescent BMI.

Among females, longer relationship duration was associated with a statistically significant higher odds of experiencing IPV regardless of measured adolescent BMI group.

Mediation Between Adolescent Overweight Concepts and IPV Victimization by Wave 2 Self-Esteem

A significant association between measured adolescent overweight BMI and IPV victimization occurred among females when data were pooled by race (Table 16, Model 2). Therefore, this was the only model eligible for mediation analysis. However, there was not a statistically significant association between adolescent self-esteem and IPV victimization during young adulthood among this group (Table 25). Therefore, self-esteem was not a candidate for mediation. Among males and all other stratifications among females, there was not a statistically significant association between measured adolescent BMI nor adolescent self-perceived overweight and young adulthood IPV victimization. Therefore, mediation analyses were not pursued among those groups.

Discussion

Findings indicate that measured overweight BMI and self-perceived overweight during adolescence do not increase the odds of reporting IPV victimization during young adulthood among males. Among females, when pooled by measured adolescent BMI and race, overweight adolescent BMI was found to increase the odds of IPV victimization in the adjusted model. When data were stratified by race and measured adolescent BMI, the primary variables of interest did not achieve statistical significance among females.

Despite null findings for the primary associations of interest, this study identified other associations that are consistent with previous research. For example, in this study childhood abuse is associated with higher odds of IPV victimization during young adulthood (8) and longer relationship duration is associated with higher odds of IPV

victimization (131) in most strata. In fully adjusted models, we found that the odds of IPV victimization were higher among non-Hispanic Black females. This racial disparity is consistent with surveillance estimates and empirical research (11, 132). Also consistent with other research we found that when compared with marriage, cohabitation was associated with greater odds of IPV victimization (131, 133). However, this result should be interpreted carefully because IPV victimization measures and relationship characteristics were measured cross-sectionally. Research has shown that selection effects influence the association between IPV and cohabitation. Over time, violent cohabiting couples are less likely to transition to marriage, violent cohabiting couples remain in cohabitations, and violent married couples separate (134). Therefore, higher IPV rates accumulate among cohabiting individuals.

One of the findings provides an interesting extension to those in the adolescent literature. Foster et al. (2004) found that early pubertal maturation is associated with increased odds of verbal and physical IPV victimization during adolescence among females (129). Yet, findings in this paper show that among females, early maturation is protective against IPV victimization during young adulthood. Together with Foster et al.'s 2004 results, our findings may suggest that early maturing girls improve their ability to select healthy relationships or leave abusive relationships during the transition to young adulthood.

It is possible that overweight BMI during adolescence was not associated with IPV victimization during young adulthood because power dynamics in adult intimate relationships likely differ from those with bullying peers during youth, and unlike familial relationships, intimate relationships are chosen. Yet, there are several limitations to this study that indicate a need for additional research. First, as a result of only including individuals who were in a current intimate relationship in the analytic sample, and measuring IPV victimization during the last 12 months, we cannot generalize to IPV

victimization throughout a person's current relationship, especially given that the average relationship duration for males and females was almost 3 years. Also, we cannot generalize to individuals in same-sex partnerships or who had an underweight BMI during adolescence.

Secondly, including gender ideology measures could have yielded more revealing associations. For example, endorsement of traditional gender norms could be associated with self-perceived weight during adolescence among females for cultural reasons. Traditional, as opposed to egalitarian, gender ideologies have been associated with physical IPV victimization among females (135). More research is needed to understand how gender ideology measures interact with self-perceived weight and measured BMI during adolescence. Findings could support IPV interventions that address the role of gender norms in IPV or inform interventions with parents that address the intergenerational transmission of traditional gender norms.

Third, it is possible that an association was not found in most of the analyses because it has been hypothesized that over time, individuals who are teased as youth see the experiences as normative and may not report them (67). Therefore, IPV experiences among individuals who had an overweight BMI during adolescence may have underreported their young adulthood IPV experiences. The IPV measure used in this study may also not have captured weight-related comments that could be considered verbal abuse. More research is needed that uses measures from the Conflicts Tactics Scale that capture weight related attacks. Further exploration of abusive weight related comments is needed to inform prevention efforts because psychological abuse often precedes physical abuse (136). Understanding weight related verbal abuse could inform prevention efforts that educate couples about making weight, diet, and appearance related comments in a non-abusive manner, and prevent such comments from escalating into psychological abuse. Such interventions could be

important for couples that include a partner whose overweight status has been persistent since adolescence and/or who is trying to lose weight. Identifying associations between weight-related verbal abuse among those with a history of overweight, real or perceived, if they exist, could also be used to shape messages in secondary prevention efforts like campaigns promoting help-seeking. Individuals with a history of overweight or perceived overweight who experienced weight-related teasing during youth, especially from someone close to them, may not see weight related communication as abusive, when it really is (47). Lastly, self-perceived overweight as defined in this study does not provide any assessment of self-stigma by indicating “negative body image” or “body dissatisfaction.” Therefore, there may be some asymmetry between the Add Health weight perception measurement and the theoretical constructs underlying the hypotheses in this study.

However, this study is unique because it addresses the effects of adolescent overweight BMI on interpersonal violence outcomes other than teasing, and the effects of adolescent self-perceived weight on outcomes other than eating behaviors. Specifically, this study makes a contribution by exploring if BMI and self-perceived weight during adolescence are associated with experiencing violent threats, as well as sexual and physical violence by a current intimate partner during young adulthood. To the author’s knowledge this is the first study to examine these associations. Given society’s emphasis on appearance and the prevalence of interpersonal violence against those with a higher BMI throughout the life course and in a variety of settings, it is important to continue exploring the longitudinal effects of adolescent overweight BMI and self-perceived overweight on intimate partnership well-being. Adolescence is when relationship expectations are developed and appearance concerns are heightened. A greater understanding of this process and its relationship to safety in intimate relationships could yield insights for IPV prevention programming.

Chapter Four Tables

TABLE 14: Percentage distribution of the analytic sample from the National Longitudinal Study of Adolescent Health, by gender unweighted n (Weighted %), Paper 2

	Males N=1,039	Females N=1,680	Full Sample N=2,719
Race			
Non-Hispanic White	810 (84.05)	1,312 (86.15)	2,122 (85.27)
Non-Hispanic Black	229 (15.95)	368 (13.85)	597 (14.73)
Experienced IPV			
No	808 (77.54)	1,341 (79.66)	2,149 (78.78)
Yes	231 (22.46)	339 (20.34)	570 (21.22)
Relationship Status at Wave 3**			
Currently Married	200 (16.11)	369 (21.66)	569 (19.35)
Currently Cohabiting	337 (34.01)	539 (33.81)	876 (33.90)
Currently Dating	502 (49.88)	772 (44.52)	1,274 (46.76)
Partner Age (Wave 3)**			
Younger	529 (51.15)	208 (11.96)	737 (28.31)
Same Age	236 (22.34)	282 (16.88)	518 (19.16)
Older	274 (26.50)	1,190 (71.15)	1,464 (52.53)
BMI (Wave 2)**			
Normal	693 (65.45)	1,261 (74.41)	1,954 (70.67)
Overweight/Obese	346 (34.55)	419 (25.59)	765 (29.33)
Weight Perception (Wave 2)**			
About Right	782 (74.94)	1,021 (59.37)	1,803 (65.87)
Slightly/Very Overweight	257 (25.06)	659 (40.63)	916 (34.13)
Pubertal Status (Wave 2)			
Younger Than Peers	184 (17.73)	253 (13.88)	437 (15.49)
Average	375 (34.36)	674 (37.84)	1,049 (36.38)
Older Than Peers	480 (47.92)	753 (48.28)	1,233 (48.13)
BMI (Wave 3)**			
Underweight/Normal Weight	420 (39.94)	943 (56.17)	1,363 (49.40)
Overweight/Obese	619 (60.06)	737 (43.83)	1,356 (50.60)
Child Abuse (any)			
No	751 (70.62)	1,257 (74.07)	2,008 (72.63)
Yes	288 (29.38)	423 (25.93)	711 (27.37)

**Parent's Highest Level
of Education (Wave 1)**

Less than High School	103 (11.37)	195 (12.14)	298 (11.82)
High School or GED	333 (33.66)	540 (33.89)	873 (33.79)
Some College/Vocational School	336 (31.31)	519 (29.97)	855 (30.53)
College Degree or Higher	267 (23.67)	426 (24.00)	693 (23.86)

** $p < 0.05$, ** $p < 0.01$*

Note: Percents may not equal 100 due to rounding.

TABLE 15: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and IPV victimization during young adulthood, males (N=1,039)

	Model 1 BMI		Model 2 BMI+Controls		Model 3 BMI+Weight Perception		Model 4 BMI+Weight Perception +Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight BMI W2	1.11	[0.77,1.59]	1.05	[0.67,1.64]	1.03	[0.60,1.77]	0.89	[0.50,1.58]
Perceived Overweight W2					1.14	[0.66,1.98]	1.44	[0.83,2.51]
Overweight BMI W3			0.94	[0.58,1.53]			0.90	[0.55,1.47]
Current Relationship Status								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			0.69	[0.39,1.22]			0.67	[0.38,1.17]
Dating			0.33**	[0.17,0.63]			0.32**	[0.16,0.61]
Partner Age								
Older Than			1.28	[0.68,2.42]			1.27	[0.67,2.41]
Younger Than			1.73	[0.95,3.12]			1.71	[0.94,3.12]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.09	[0.98,1.20]			1.09	[0.98,1.20]
NH Black			2.74**	[1.61,4.64]			2.88**	[1.68,4.93]
Perceived Pubertal Status								
Younger Than Peers			1.48	[0.88,2.48]			1.51	[0.90,2.53]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			1.34	[0.89,2.01]			1.36	[0.91,2.04]
Parent Education Level								
Less than HS			2.37**	[1.26,4.44]			2.39**	[1.27,4.48]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.69*	[1.11,2.55]			1.68*	[1.11,2.55]
College+			1.21	[0.66,2.22]			1.21	[0.66,2.23]
Child Abuse			1.93**	[1.29,2.89]			1.89**	[1.26,2.85]
Age W2			0.90	[0.77,1.05]			0.90	[0.77,1.05]

* $p<0.05$, ** $p<0.01$

TABLE 16: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and IPV victimization during young adulthood, females (N=1,680)

	Model 1 BMI		Model 2 BMI+Controls		Model 3 BMI+ Weight Perception		Model 4 BMI+Weight Perception+ Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight BMI W2	1.66**	[1.21,2.28]	1.41*	[1.00,1.98]	1.77**	[1.19,2.62]	1.51*	[1.01,2.25]
Perceived Overweight W2					0.90	[0.59,1.36]	0.85	[0.56,1.29]
Overweight BMI W3			1.23	[0.81,1.87]			1.28	[0.84,1.96]
Current Relationship Status								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			2.15**	[1.53,3.02]			2.15**	[1.53,3.01]
Dating			0.53**	[0.36,0.78]			0.53**	[0.36,0.78]
Partner Age								
Older Than			1.39	[0.87,2.22]			1.39	[0.87,2.23]
Younger Than			2.10*	[1.10,3.98]			2.10*	[1.11,4.00]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration (years)			1.18**	[1.09,1.28]			1.18**	[1.09,1.28]
NH Black			1.70*	[1.14,2.55]			1.67*	[1.11,2.50]
Perceived Pubertal Status								
Younger Than Peers			0.74	[0.46,1.18]			0.73	[0.45,1.18]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			0.69*	[0.50,0.97]			0.70*	[0.50,0.97]
Parent Education Level								
Less than HS			1.41	[0.87,2.27]			1.40	[0.86,2.26]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.19	[0.78,1.80]			1.18	[0.78,1.79]
College+			1.57*	[1.01,2.44]			1.58*	[1.02,2.45]
Child Abuse			1.63**	[1.21,2.19]			1.64**	[1.22,2.20]
Age W2			0.86*	[0.77,0.97]			0.87*	[0.77,0.97]

* $p<0.05$, ** $p<0.01$

TABLE 17: Odds Ratios and 95% confidence intervals for the association between adolescent overweight, self-perceived overweight BMI, and IPV victimization during young adulthood, males, by race

WHITES (N=810)	Model 1 BMI		Model 2 BMI+Controls		Model 3 BMI+ Weight Perception		Model 4 BMI+Weight Perception+ Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight BMI W2	1.03	[0.65,1.62]	1.08	[0.66,1.78]	0.79	[0.38,1.64]	0.85	[0.43,1.68]
Perceived Overweight W2					1.57	[0.78,3.17]	1.60	[0.82,3.12]
Overweight BMI W3			0.91	[0.54,1.54]			0.86	[0.50,1.47]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			0.53*	[0.29,0.97]			0.50*	[0.27,0.93]
Dating			0.26**	[0.13,0.53]			0.26**	[0.12,0.53]
Partner Age W3								
Older Than			1.10	[0.55,2.22]			1.10	[0.55,2.19]
Younger Than			1.85*	[1.06,3.24]			1.82*	[1.04,3.18]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.02	[0.90,1.16]			1.02	[0.90,1.16]
Perceived Pubertal Status								
Younger Than Peers			1.59	[0.84,3.00]			1.65	[0.87,3.11]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			1.16	[0.75,1.80]			1.20	[0.77,1.86]
Parent Education Level								
Less than HS			2.46*	[1.18,5.11]			2.44*	[1.18,5.05]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.81*	[1.14,2.87]			1.81*	[1.14,2.88]
College+			1.48	[0.76,2.88]			1.48	[0.76,2.89]
Child Abuse			1.61	[1.00,2.58]			1.55	[0.94,2.57]
Age W2			0.93	[0.78,1.11]			0.93	[0.79,1.11]

* $p < 0.05$, ** $p < 0.01$

BLACKS (N=229)	Model 1		Model 2		Model 3		Model 4	
	BMI		BMI+Controls		BMI+ Weight Perception		BMI+Weight Perception+ Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight BMI W2	1.34	[0.72,2.47]	1.36	[0.55,3.38]	1.35	[0.62,2.94]	1.35	[0.49,3.67]
Perceived Overweight W2					0.96	[0.36,2.56]	1.04	[0.39,2.80]
Overweight BMI W3			0.65	[0.25,1.72]			0.65	[0.25,1.70]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			2.06	[0.63,6.72]			2.05	[0.63,6.72]
Dating			0.56	[0.18,1.72]			0.56	[0.18,1.74]
Partner Age W3								
Older Than			1.19	[0.26,5.45]			1.18	[0.26,5.44]
Younger Than			0.93	[0.16,5.39]			0.93	[0.16,5.38]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.35**	[1.17,1.56]			1.35**	[1.17,1.56]
Perceived Pubertal Status								
Younger Than								
Peers			2.47	[0.98,6.22]			2.47	[0.98,6.21]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			3.30	[0.98,11.14]			3.30	[0.98,11.13]
Parent Education Level								
Less than HS			2.15	[0.48,9.57]			2.15	[0.49,9.54]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.57	[0.66,3.71]			1.56	[0.66,3.69]
College+			0.44	[0.14,1.39]			0.44	[0.14,1.40]
Child Abuse			3.85**	[1.87,7.94]			3.84**	[1.83,8.05]
Age W2			0.74*	[0.55,0.98]			0.74*	[0.55,0.98]

* $p<0.05$, ** $p<0.01$

TABLE 18: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI, self-perceived overweight, and IPV victimization during young adulthood, females, by race

WHITES (N=1,312)	Model 1		Model 2		Model 3		Model 4	
	BMI Unadjusted		BMI+Controls		BMI+ Weight Perception		BMI+Weight Perception+ Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight BMI W2	1.57*	[1.09,2.27]	1.35	[0.88,2.06]	1.57*	[1.03,2.41]	1.43	[0.89,2.29]
Perceived Overweight W2					1.00	[0.65,1.53]	0.88	[0.55,1.40]
Overweight BMI W3			1.25	[0.77,2.02]			1.29	[0.78,2.13]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			2.40**	[1.68,3.44]			2.40**	[1.68,3.44]
Dating			0.47**	[0.30,0.73]			0.46**	[0.29,0.73]
Partner Age W3								
Older Than			1.37	[0.80,2.35]			1.37	[0.80,2.35]
Younger Than			2.05*	[1.01,4.14]			2.05*	[1.01,4.16]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.20**	[1.09,1.31]			1.19**	[1.09,1.31]
Perceived Pubertal Status								
Younger Than Peers			0.78	[0.46,1.33]			0.77	[0.45,1.34]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			0.61*	[0.42,0.90]			0.62*	[0.42,0.90]
Parent Education Level								
Less than HS			1.50	[0.82,2.74]			1.50	[0.82,2.72]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.23	[0.77,1.97]			1.23	[0.77,1.96]
College+			1.58	[0.96,2.59]			1.58	[0.97,2.59]
Child Abuse			1.76**	[1.27,2.43]			1.77**	[1.29,2.44]
Age W2			0.85*	[0.75,0.96]			0.85*	[0.75,0.97]

* $p<0.05$, ** $p<0.01$

BLACKS (N=368)	Model 1		Model 2		Model 3		Model 4	
	BMI		BMI+Controls		BMI+ Weight Perception		BMI+Weight Perception+ Controls	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Overweight BMI W2	1.55	[0.89,2.71]	1.45	[0.80,2.63]	1.94	[0.79,4.74]	1.91	[0.78,4.67]
Perceived Overweight W2					0.65	[0.27,1.61]	0.55	[0.24,1.27]
Overweight BMI W3			1.28	[0.69,2.37]			1.40	[0.76,2.58]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			1.03	[0.36,2.99]			1.00	[0.37,2.69]
Dating			0.59	[0.22,1.59]			0.62	[0.23,1.66]
Partner Age W3								
Older Than			1.31	[0.50,3.47]			1.27	[0.48,3.34]
Younger Than			2.32	[0.59,9.16]			2.32	[0.60,9.07]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.17*	[1.01,1.36]			1.17*	[1.01,1.36]
Perceived Pubertal Status								
Younger Than								
Peers			0.61	[0.26,1.40]			0.61	[0.26,1.42]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			1.09	[0.45,2.62]			1.22	[0.52,2.86]
Parent Education Level								
Less than HS			0.94	[0.34,2.57]			0.88	[0.32,2.42]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			0.81	[0.37,1.75]			0.77	[0.34,1.75]
College+			1.66	[0.68,4.06]			1.68	[0.69,4.10]
Child Abuse			1.29	[0.65,2.56]			1.29	[0.63,2.61]
Age W2			0.90	[0.71,1.15]			0.96	[0.76,1.21]

* $p<0.05$, ** $p<0.01$

TABLE 19: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and IPV victimization during young adulthood males, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave2 Unadjusted (N=693)		Among Normal BMI at Wave2 Adjusted (N=693)		Among Overweight Wave at 2 Unadjusted (N=346)		Among Overweight Wave at 2 Adjusted (N=346)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Perceived Overweight W2	2.22**	[1.01,4.91]	2.31	[0.95,5.62]	0.77	[0.42,1.42]	1.13	[0.59,2.18]
Overweight BMI W3			0.68	[0.40,1.17]			5.64*	[1.33,24.00]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			0.79	[0.40,1.57]			0.35*	[0.15,0.83]
Dating			0.36*	[0.17,0.79]			0.19**	[0.07,0.52]
Partner Age W3								
Older Than			1.04	[0.47,2.29]			1.65	[0.65,4.17]
Younger Than			1.69	[0.94,3.04]			1.83	[0.65,5.16]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.16**	[1.04,1.29]			1.02	[0.86,1.21]
NH Black			2.50**	[1.32,4.73]			4.08**	[1.73,9.63]
Perceived Pubertal Status								
Younger Than Peers			1.37	[0.71,2.66]			2.92	[0.88,9.67]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			1.25	[0.71,2.19]			2.48*	[1.06,5.82]
Parent Education Level								
Less than HS			2.09	[0.93,4.70]			4.37**	[1.81,10.57]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.75	[0.98,3.12]			1.45	[0.65,3.21]
College+			0.84	[0.45,1.57]			2.31	[0.76,7.01]
Child Abuse			1.58	[0.95,2.64]			2.50*	[1.23,5.05]
Age W2			0.89	[0.76,1.04]			0.88	[0.65,1.19]

* $p<0.05$, ** $p<0.01$

TABLE 20: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and IPV victimization during young adulthood, non-Hispanic White males, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave2 Unadjusted (N=545)		Among Normal BMI at Wave2 Adjusted (N=545)		Among Overweight Wave at 2 Unadjusted (N=265)		Among Overweight Wave at 2 Adjusted (N=265)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Perceived Overweight W2	2.43*	[1.03,5.73]	2.32	[0.89,6.09]	1.10	[0.50,2.42]	1.25	[0.58,2.67]
Overweight BMI W3			0.67	[0.37,1.23]			21.75**	[3.95,119.65]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			0.67	[0.31,1.45]			0.25*	[0.08,0.77]
Dating			0.32*	[0.13,0.79]			0.14**	[0.05,0.45]
Partner Age W3								
Older Than			0.78	[0.33,1.89]			1.78	[0.58,5.47]
Younger Than			1.62	[0.88,2.97]			2.53	[0.82,7.85]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.10	[0.95,1.27]			0.92	[0.72,1.18]
Perceived Pubertal Status								
Younger Than Peers			1.31	[0.59,2.89]			5.41*	[1.23,23.84]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			0.98	[0.55,1.76]			3.31	[1.00,10.99]
Parent Education Level								
Less than HS			2.74*	[1.01,7.43]			3.09*	[1.17,8.18]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			2.03*	[1.07,3.85]			1.43	[0.54,3.76]
College+			0.98	[0.49,1.95]			3.02	[0.87,10.48]
Child Abuse			1.36	[0.74,2.50]			1.85	[0.76,4.50]
Age W2			0.92	[0.76,1.11]			1.01	[0.71,1.43]

* $p<0.05$, ** $p<0.01$

TABLE 21: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and IPV victimization during young adulthood, non-Hispanic Black males, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Among Normal BMI at Wave2 Unadjusted (N=148)		Among Normal BMI at Wave2 Adjusted (N=148)		Among Overweight Wave at 2 Unadjusted (N=81)		Among Overweight Wave at 2 Adjusted (N=81)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Perceived Overweight W2	2.91	[0.39,21.50]	1.39	[0.06,31.45]	0.69	[0.18,2.66]	0.80	[0.15,4.37]
Overweight BMI W3			0.44	[0.14,1.34]			1.76	[0.13,23.61]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			1.83	[0.38,8.78]			1.41	[0.23,8.60]
Dating			0.48	[0.08,2.86]			0.08*	[0.01,0.67]
Partner Age W3								
Older Than			2.76	[0.45,17.09]			0.06*	[0.00,0.87]
Younger Than			2.72	[0.57,12.98]			0.06*	[0.00,0.74]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.32**	[1.11,1.58]			1.44*	[1.01,2.05]
Perceived Pubertal Status								
Younger Than Peers			5.54	[0.86,35.52]			4.67	[0.27,80.96]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			5.25	[0.74,37.16]			14.75	[0.49,447.75]
Parent Education Level								
Less than HS			0.46	[0.10,2.10]			7.27	[0.59,90.25]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			0.92	[0.29,2.95]			1.57	[0.30,8.11]
College+			0.29	[0.05,1.75]			0.18	[0.02,2.15]
Child Abuse			5.36**	[1.76,16.29]			6.06	[0.91,40.36]
Age W2			0.85	[0.59,1.21]			0.50*	[0.26,0.99]

* $p < 0.05$, ** $p < 0.01$

TABLE 22: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and IPV victimization during young adulthood, females, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Normal BMI at Wave2 Unadjusted (N=1,261)		Normal BMI at Wave2 Adjusted (N=1,261)		Overweight Wave at 2 Unadjusted (N=419)		Overweight Wave at 2 Adjusted (N=419)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Perceived Overweight W2	0.94	[0.66,1.35]	0.85	[0.57,1.28]	0.79	[0.31,2.02]	0.90	[0.32,2.48]
Overweight BMI W3			1.17	[0.70,1.96]			2.39	[0.61,9.46]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			1.93**	[1.24,2.99]			2.87**	[1.38,5.97]
Dating			0.58*	[0.36,0.94]			0.45	[0.20,1.02]
Partner Age W3								
Older Than			1.44	[0.76,2.74]			1.44	[0.56,3.69]
Younger Than			1.97	[0.89,4.34]			3.06	[0.79,11.89]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.17**	[1.07,1.29]			1.20*	[1.02,1.41]
NH Black			1.53	[0.95,2.48]			2.01	[0.99,4.08]
Perceived Pubertal Status								
Younger Than Peers			0.69	[0.42,1.13]			0.92	[0.35,2.41]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			0.75	[0.50,1.12]			0.60	[0.32,1.12]
Parent Education Level								
Less than HS			1.01	[0.50,2.02]			2.29*	[1.14,4.60]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.15	[0.74,1.78]			1.25	[0.59,2.65]
College+			1.36	[0.81,2.30]			2.10	[0.72,6.12]
Child Abuse			1.72**	[1.15,2.57]			1.70	[0.93,3.12]
Age W2			0.90	[0.78,1.03]			0.82	[0.65,1.03]

* $p<0.05$, ** $p<0.01$

TABLE 23: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and IPV victimization during young adulthood, non-Hispanic White females, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Normal BMI at Wave2 Unadjusted (N=1,027)		Normal BMI at Wave2 Adjusted (N=1,027)		Overweight Wave at 2 Unadjusted (N=285)		Overweight Wave at 2 Adjusted (N=285)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Perceived Overweight W2	0.99	[0.67,1.48]	0.89	[0.57,1.40]	1.02	[0.33,3.14]	0.72	[0.21,2.40]
Overweight BMI W3			1.22	[0.68,2.19]			1.51	[0.29,7.88]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			1.97**	[1.23,3.16]			4.36**	[1.73,11.00]
Dating			0.51*	[0.30,0.89]			0.32*	[0.10,0.97]
Partner Age W3								
Older Than			1.34	[0.66,2.70]			1.70	[0.49,5.95]
Younger Than			1.63	[0.69,3.86]			6.31*	[1.13,35.19]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.17**	[1.05,1.31]			1.29*	[1.03,1.63]
Perceived Pubertal Status								
Younger Than Peers			0.73	[0.41,1.29]			1.51	[0.42,5.38]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			0.68	[0.44,1.04]			0.47	[0.20,1.09]
Parent Education Level								
Less than HS			1.04	[0.47,2.29]			2.67*	[1.10,6.44]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.12	[0.69,1.80]			1.42	[0.55,3.65]
College+			1.32	[0.75,2.31]			2.19	[0.66,7.28]
Child Abuse Age W2			1.85**	[1.21,2.83]			1.99	[0.92,4.32]
			0.89	[0.76,1.04]			0.80	[0.60,1.05]

* $p<0.05$, ** $p<0.01$

TABLE 24: Odds ratios and 95% confidence intervals for the association between self-perceived overweight during adolescence and IPV victimization during young adulthood, non-Hispanic Black females, by adolescent BMI

	Misperceived Overweight Models				Correctly Perceived Overweight Models			
	Normal BMI at Wave2 Unadjusted (N=234)		Normal BMI at Wave2 Adjusted (N=234)		Overweight Wave at 2 Unadjusted (N=134)		Overweight Wave at 2 Adjusted (N=134)	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Perceived Overweight W2	0.66	[0.24,1.81]	0.45	[0.16,1.30]	0.65	[0.15,2.76]	0.66	[0.13,3.43]
Overweight BMI W3			0.99	[0.39,2.50]			103.22**	[10.86,981.55]
Relationship Status W3								
Married			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Cohabiting			3.35	[0.83,13.54]			0.67	[0.13,3.35]
Dating			2.38	[0.64,8.91]			0.45	[0.06,3.57]
Partner Age W3								
Older Than			3.57	[0.74,17.07]			0.93	[0.26,3.26]
Younger Than			13.32**	[2.13,83.14]			0.60	[0.08,4.57]
Same Age			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Relationship Duration			1.41**	[1.19,1.66]			1.09	[0.88,1.35]
Perceived Pubertal Status								
Younger Than Peers			0.51	[0.18,1.38]			0.86	[0.15,4.85]
Average			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Older Than Peers			1.86	[0.60,5.76]			1.04	[0.32,3.38]
Parent Education Level								
Less than HS			1.02	[0.18,5.79]			0.80	[0.20,3.25]
HS/GED			1.00	[1.00,1.00]			1.00	[1.00,1.00]
Some College/Vocational			1.39	[0.43,4.48]			0.57	[0.15,2.17]
College+			2.51	[0.73,8.69]			1.47	[0.24,8.84]
Child Abuse			1.14	[0.40,3.27]			1.61	[0.62,4.17]
Age W2			0.90	[0.70,1.15]			0.96	[0.65,1.41]

* $p<0.05$, ** $p<0.01$

TABLE 25: Odds Ratios and 95% confidence intervals for the association between adolescent overweight BMI and IPV victimization during young adulthood controlling for self-esteem Wave 2, females (N=1,680)

	OR	95%CI
Overweight BMI W2	1.36	[0.96,1.94]
Overweight BMI W3	1.24	[0.81,1.91]
Self-Esteem W2	0.96	[0.92,1.01]
Current Relationship Status		
Married	1.00	[1.00,1.00]
Cohabiting	2.14**	[1.52,3.01]
Dating	0.53**	[0.36,0.79]
Partner Age		
Older Than	1.36	[0.85,2.16]
Younger Than	2.03*	[1.07,3.86]
Same Age	1.00	[1.00,1.00]
Relationship Duration (years)	1.18**	[1.09,1.28]
NH Black	1.78**	[1.19,2.67]
Perceived Pubertal Status		
Younger Than Peers	0.75	[0.47,1.21]
Average	1.00	[1.00,1.00]
Older Than Peers	0.69*	[0.50,0.97]
Parent Education Level		
Less than HS	1.45	[0.90,2.35]
HS/GED	1.00	[1.00,1.00]
Some College/Vocational	1.20	[0.79,1.80]
College	1.61*	[1.04,2.48]
Child Abuse	1.59**	[1.18,2.14]
Age W2	0.86*	[0.77,0.97]

* $p < 0.05$, ** $p < 0.01$

CHAPTER 5: Conclusions

The purpose of this dissertation was to explore if a physical weight concept (overweight body mass index) and a cognitive weight concept (self-perceived overweight) during adolescence are associated with two outcomes during young adulthood: 1) diagnosis with one or more of the three STDs (*Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis*) included in the Wave 3 Add Health STD urine test and 2) self-reported IPV victimization. These associations were selected because traditionally research has focused on associations between aspects of body image or satisfaction and eating disorders/disordered eating (63, 64, 137, 138) or higher BMI and weight-based victimization during youth (18, 36). However, it is important to understand how adolescent overweight BMI and body image influence normative aspects of development like sexual and relationship health. In both papers, life course theory guided the proposed association between adolescence and young adulthood, and objectification theory was used to hypothesize potential associations between the variables of interest.

To the author's knowledge, extant research has not examined the associations of interest in this dissertation, and it is important to explore these associations for two reasons. First, although childhood obesity rates have been mostly steady for the last 10 years (139), overall increases in adolescent obesity are recent (65, 66). This increase is correlated with a number of societal shortcomings like poor food environments in schools (140). Nevertheless, as a result of this increase, increased public health concern has emerged because overweight is associated with chronic diseases like diabetes (141). However, given that adolescence is a young biological age, and many life events

related to intimate relationships are still possible, it is important to understand the long-term effects of adolescent overweight BMI on outcomes other than chronic diseases. Secondly, recommendations suggest that adolescent development curricula should help individuals develop healthy attitudes about their body and understand how such attitudes can influence decision-making and behavior (69, 70). While these efforts are important because events during adolescence can define developmental trajectories, it is unknown if body image during adolescence is empirically associated with young adult sexual and relationship health. This section will summarize the findings from both papers and provide recommendations for future research.

Results from Paper 1 show that there is not a statistically significant association between adolescent measured BMI and STD status during young adulthood or between adolescent self-perceived weight and STD status during young adulthood among non-Hispanic Whites or non-Hispanic Blacks of either gender. When viewed within the context of existing literature (21, 23, 24, 26), the null findings in Paper 1 may indicate that the association between measured overweight BMI and sexual health, as well as body image and sexual health is time-limited, or restricted to adolescence. This is a reasonable assumption given the intensity of appearance pressures and lack of experience negotiating sexual relationships during adolescence. Further, during the transition from adolescence to young adulthood individuals begin to have longer and more emotionally intimate relationships that may be less affected by associations between appearance and sexual risk, which have been found to occur during adolescence (103).

It is also possible that an association between overweight BMI and STD status does not exist. Therefore, it may be more useful for future research to focus on whether overweight BMI influences other reproductive health outcomes during the life course. For example, it is established that obese BMI (>30) has negative consequences for

pregnancy like gestational diabetes and preeclampsia (142, 143). Overweight adolescent females may be especially at risk for such reproductive outcomes if weight is not lost before their first pregnancy. Additional research investigating how to prevent adolescent obesity all together, as well as how to prevent it from continuing into young adulthood is needed to prevent negative pregnancy related outcomes.

Findings from Paper 2 show that in the analytic sample there is not a statistically significant association between adolescent measured overweight BMI and reporting IPV victimization during young adulthood, or between adolescent self-perceived overweight and reporting IPV victimization during young adulthood among non-Hispanic White or non-Hispanic Black males. Among females when pooled by race, adolescent overweight BMI was a statistically significant predictor of reporting IPV victimization during young adulthood in a fully adjusted model. However, the finding probably lacks practical significance given that the confidence interval begins at one, the p-value is equal to 0.05, and no statistically significant associations were found in fully controlled models when females were stratified by race. Findings could reflect two shortcomings of the IPV measure used: 1) the measure collapsed all types of violence together and 2) the measure did not capture the tone and content of communication related to dietary behaviors, physical activity, and/or appearance from a significant other.

Given that other research has found an association between weight and non-physical mistreatment, additional research is needed that focuses on the content and intensity of communication with significant others during young adulthood. Traditionally communication about weight related factors like diet or physical activity within couples has been conceptualized as an expression of concern for health (144, 145). However, as Eisenberg et al. (2013) suggest, it is possible that comments could be considered hurtful, condescending, threatening, or abusive (145). It is especially possible that someone with a history of overweight or self-perceived overweight could view such

comments as negative. Research has shown that hurtful weight-related comments from a significant other are not benign, and can negatively influence health behaviors (119), so it is plausible that they have emotional implications and could be considered abusive as well.

It is possible that the complex and diverse sexual and intimate relationship trajectories between adolescence and young adulthood prevented a statistical association from emerging in both papers. Present analyses could not consider the content or processes of relationships through time. Also, moderation by factors like adolescent self-perceived attractiveness, body satisfaction, or self-esteem was not examined, but could more fully capture the extent to which individuals were internalizing their actual or self-perceived appearance.

Although overall, the main association of interest was not statistically significant in either paper, established risk factors for both outcomes (STD status and IPV victimization) achieved statistical significance. For example, longer duration in a current intimate relationship was associated with higher odds of IPV victimization in many strata. These results indicate a need for the public health community to continue to address risk factors during young adulthood, and that tailored sexual and relationship health interventions are needed throughout the life course.

Despite the null findings in the present work, adolescence remains a significant time period when attitudes about intimate relationships, sexual behaviors, weight stigma, and body image interact for the first time. It will be important for the research community to continue efforts to understand how all of these factors influence health and development into young adulthood. It also remains important for the public health community to give attention to how weight based bullying prevention campaigns, the integration of adolescent obesity and eating disorder prevention efforts, and comprehensive sexuality education efforts present information about overweight BMI

and self-perceived overweight even though these factors did not have a statistically significant association with the outcomes of interest in this dissertation. Specifically, these efforts should assure that they are presenting a unified and clear message against weight stigma, from others and that is self-imposed. Weight stigma, or prejudice against overweight, is not only a source of injustice in today's society, but negatively influences well-being in a variety of ways throughout the life course.

APPENDIX 1: Paper One Additional Analyses

TABLE 26: Analytical Sample of National Longitudinal Study of Adolescent Health Respondents (Paper 1)

MALES	FEMALES
<p>6,759 males with valid sample weights</p> <ul style="list-style-type: none"> ○ Subtract 185 underweight males • New total: 6,574 <ul style="list-style-type: none"> ○ Subtract 920 with slightly underweight perception • New total: 5,654 <ul style="list-style-type: none"> ○ Subtract 1,704 missing BMI at Wave 2 • New total: 3,950 <ul style="list-style-type: none"> ○ Subtract 60 missing weight perception or have very underweight perception at Wave 2 • New total: 3,890 <ul style="list-style-type: none"> ○ Subtract 850 missing sex of current partner or who are in same sex partnership • New total: 3,040 <ul style="list-style-type: none"> ○ Subtract 570 missing information on having had sex in the last 12 months, who have not had sex in last 12 months, who were missing on virginity, or who were virgins at Wave 3 • New total: 2,470 <ul style="list-style-type: none"> ○ Subtract 192 Hispanic Whites and Blacks • New total: 2,278 <ul style="list-style-type: none"> ○ Subtract 271 Non-Hispanics of other races • New total: 2,007 <ul style="list-style-type: none"> ○ Subtract 230 Hispanics of other races or who are missing on race/ethnicity • New total: 1,777 <ul style="list-style-type: none"> ○ Subtract 52 who are missing on condom use, partner number, or partner STD history at Wave 3 • New total: 1,725 <ul style="list-style-type: none"> ○ Subtract 252 missing on STD status • New total: 1,473 <ul style="list-style-type: none"> ○ Subtract 72 missing on PVT score, age at Wave 2, family structure, or self-esteem at 	<p>7,563 females with valid sample weight</p> <ul style="list-style-type: none"> ○ Subtract 161 underweight females • New total: 7,402 <ul style="list-style-type: none"> ○ Subtract 473 with slightly underweight perception • New total: 6,929 <ul style="list-style-type: none"> ○ Subtract 1,949 missing BMI at Wave 2 • New total: 4,980 <ul style="list-style-type: none"> ○ Subtract 46 missing weight perception or have very underweight perception at Wave 2 • New total: 4,934 <ul style="list-style-type: none"> ○ Subtract 872 missing sex of current partner or who are in same sex partnership • New total: 4,062 <ul style="list-style-type: none"> ○ Subtract 620 missing on having had sex in the last 12 months, who have not had sex in last 12 months, were missing on virginity, or who were virgins at Wave 3 • New total: 3,442 <ul style="list-style-type: none"> ○ Subtract 214 Hispanic Whites and Blacks • New total: 3,228 <ul style="list-style-type: none"> ○ Subtract 323 Non-Hispanics of other races • New total: 2,905 <ul style="list-style-type: none"> ○ Subtract 296 Hispanics of other races or who are missing on race/ethnicity • New total: 2,609 <ul style="list-style-type: none"> ○ Subtract 191 who were pregnant at W2 or W3 • New total: 2,418 <ul style="list-style-type: none"> ○ Subtract 70 missing on condom use, partner number, or partner STD history at Wave 3 • New total: 2,348 <ul style="list-style-type: none"> ○ Subtract 356 missing on STD status • New total: 1,992 <ul style="list-style-type: none"> ○ Subtract 73 missing on PVT

- Wave 2
 - New total: 1,401
 - Subtract 44 missing on Relationship status at Wave 3
 - New total 1,357
 - Subtract 79 missing on Wave 3 BMI or parent education
- FINAL TOAL: 1,278**

- score, age at Wave 2, family structure, or self-esteem at Wave 2
 - New total: 1,919
 - Subtract 41 missing on Relationship status at Wave 3
 - New total 1,878
 - Subtract 109 missing on Wave 3 BMI or parent education
- FINAL TOTAL: 1,769**

Preliminary Analysis To Identify Control Variables

- Variables were included as controls if they were statistically significant at $p < 0.05$, or theoretically relevant. If a variable was significant at $p < 0.05$ for one gender it was included in models for the other gender for symmetry.
- The analytical sample used for Table 27 is exactly like the analytical sample used in the final analysis, except individuals were also not missing on the variables being tested. Therefore, the number of people differs in both analytical samples.

TABLE 27: Odds ratios (95% Confidence Intervals) from logistic regression of association between Wave 3 STD status and potential control variables (Paper 1)

	MALES N=1,197	FEMALES N=1,713
Two Parent Household	0.57 [0.28,1.18]	0.49** [0.31,0.75]
Perceived Pubertal Status		
Younger	1.11 [0.51,2.39]	1.15 [0.67,2.00]
Same as peers	Referent	Referent
Older	0.68 [0.34,1.39]	0.90 [0.54,1.50]
Parent Education	0.44+ [0.19,1.05]	0.33** [0.20,0.55]
In Current Relationship Wave 3	0.53*[0.29,0.95]	1.64* [1.03,2.61]
Child Abuse	0.96 [0.43,2.15]	1.50+ [0.93,2.43]
Overweight BMI Wave 3	0.40** [0.20,0.77]	1.35 [0.90,2.01]
Age Wave 2	1.27*[1.06,1.53]	0.97 [0.82,1.15]
PVT Score	0.96**[0.94,0.98]	0.97** [0.95,0.98]
Self-Esteem Wave 2	1.00 [0.91,1.11]	1.03 [0.96,1.10]

+ $p < 0.01$, * $p < 0.05$, ** $p < 0.01$

TABLE 28: OLS regression for association between adolescent self-esteem and adolescent self-perceived overweight, by race, among males (Paper 1)

	White (n=975)		Black (n=303)	
	b	se	b	Se
Overweight BMI W2	-0.27	[0.33]	0.23	[0.37]
Overweight Perception W2	-1.39**	[0.38]	-0.45	[0.63]
Age W2	-0.25**	[0.07]	-0.04	[0.23]
Two Parent HH	0.33	[0.39]	0.97	[0.54]
PVT Score	-0.01	[0.01]	-0.01	[0.02]
Parent Education High School +	0.83	[0.49]	0.33	[0.75]
Constant	31.19**	[1.74]	27.56**	[4.52]

* $p < 0.05$, ** $p < 0.01$

TABLE 29: OLS regression for association between adolescent self-esteem and adolescent self-perceived overweight, by race, among females (Paper 1)

	White (n=1344)		Black (n=425)	
	b	se	b	Se
Overweight BMI W2	0.02	[0.31]	-0.07	[0.42]
Overweight Perception W2	-1.32**	[0.27]	-1.11*	[0.49]
Age W2	-0.05	[0.07]	-0.05	[0.14]
Two Parent HH	0.42	[0.26]	-0.24	[0.37]
PVT Score	0.03**	[0.01]	-0.03	[0.01]
Parent Education High School+	-0.84*	[0.37]	0.06	[0.35]
Constant	23.64**	[1.38]	29.43**	[2.14]

* $p < 0.05$, ** $p < 0.01$

Sensitivity Analysis Regarding the Inclusion of Slightly Underweight Individuals Paper One

The tables below show that:

- *Males and females who perceive themselves as somewhat underweight at Wave 2 **do not differ** from all others (those who perceive themselves as about right or overweight/obese) on race, STD status at Wave 3, parent education, and family structure at W2.*
- *Males and females who perceive themselves as somewhat underweight at Wave 2 **do differ** from those who perceive themselves as about right or overweight/obese on objective weight at Wave 2.*

(People in the table who perceived themselves as somewhat underweight were not missing on any of the values of interest)

TABLE 30: Weighted Column Proportions, Selected Characteristics by Wave 2 Self-Perceived Weight (Paper 1)

	MALES				FEMALES		
	Somewhat UW Perception N=311	Overwgt./ Obese or Abt. Right Perception N=1,278	Total N=1,589		Somewhat UW Perception N=138	Overwgt./ Obese or Abt. Right Perception N=1,769	Total N=1,907
Race				Race			
NH White	0.83	0.83	0.83	NH White	0.79	0.84	0.84
NH Black	0.17	0.17	0.17	NH Black	0.21	0.16	0.16
Total	1	1	1	Total	1	1	1
STD positive				STD positive			
No	0.95	0.95	0.95	No	0.92	0.93	0.93
Yes	0.05	0.05	0.05	Yes	0.08	0.07	0.07
Total	1	1	1	Total	1	1	1
Measured BMI W2**				Measured BMI W2**			
Normal	0.96	0.65	0.71	Normal	0.94	0.74	0.76
Overweight/Obese	0.04	0.35	0.29	Overweight/Obese	0.06	0.26	0.24
Total	1	1	1	Total	1	1	1
Paredu				Paredu			
<HS	0.10	0.09	0.09	<HS	0.11	0.12	0.12
HS+	0.90	0.91	0.91	HS+	0.89	0.88	0.88
Total	1	1	1	Total	1	1	1
2 Parent HH				2 Parent HH			
No	0.29	0.23	0.24	No	0.33	0.27	0.27
Yes	0.71	0.77	0.76	Yes	0.67	0.73	0.73
Total	1	1	1	Total	1	1	1

* $p < 0.05$, ** $p < 0.01$, Note: The analytical sample used for these tables is exactly like the final analytical sample used in Paper 1. However, the analytical sample for this table includes individuals who perceived themselves to be slightly underweight at Wave 2.

APPENDIX 2: Paper Two Additional Analyses

TABLE 31: Analytical Sample of National Longitudinal Study of Adolescent Health Respondents (Paper 2)

MALES	FEMALES
<p>6,759 males with valid sample weights</p> <ul style="list-style-type: none"> ○ Subtract 185 underweight • New total: 6,574 <ul style="list-style-type: none"> ○ Subtract 920 with slightly underweight perception • New total: 5,654 <ul style="list-style-type: none"> ○ Subtract 1,704 missing BMI at Wave 2 • New total: 3,950 <ul style="list-style-type: none"> ○ Subtract 60 missing weight perception at Wave 2 • New total: 3,890 <ul style="list-style-type: none"> ○ Subtract 850 missing sex of current partner or who are in same sex partnership • New total: 3,040 <ul style="list-style-type: none"> ○ Subtract 229 Hispanic Whites and Blacks • New total: 2,811 <ul style="list-style-type: none"> ○ Subtract 351 Non-Hispanics of other races • New total: 2,460 <ul style="list-style-type: none"> ○ Subtract 282 Hispanics of other races or who are missing on race • New total: 2,178 <ul style="list-style-type: none"> ○ Subtract 60 missing on IPV • New total: 2,118 <ul style="list-style-type: none"> ○ Subtract 105 missing on child abuse or age or Wave 2 self-esteem • New total: 2,013 <ul style="list-style-type: none"> ○ Subtract 773 missing on relationship type at Wave 3 • New total: 1,240 <ul style="list-style-type: none"> ○ Subtract 63 missing on Wave 3 BMI • New total 1,177 <ul style="list-style-type: none"> ○ Subtract 138 missing on parent education, partner age, relationship duration, or pubertal status <p>FINAL TOAL: 1,039</p>	<p>7,563 females with valid sample weight</p> <ul style="list-style-type: none"> ○ Subtract 161 underweight • New total: 7,402 <ul style="list-style-type: none"> ○ Subtract 473 with slightly underweight perception • New total: 6,929 <ul style="list-style-type: none"> ○ Subtract 1,949 missing BMI at Wave 2 • New total: 4,980 <ul style="list-style-type: none"> ○ Subtract 46 missing weight perception at Wave 2 • New total: 4,934 <ul style="list-style-type: none"> ○ Subtract 872 missing sex of current partner or who are in same sex partnership • New total: 4,062 <ul style="list-style-type: none"> ○ Subtract Hispanic 257 Whites and Blacks • New total: 3,805 <ul style="list-style-type: none"> ○ Subtract 413 Non-Hispanics of other races • New total: 3,392 <ul style="list-style-type: none"> ○ Subtract 367 Hispanics of other races or who are missing on race • New total: 3,025 <ul style="list-style-type: none"> ○ Subtract 205 who were pregnant at Wave 2 or Wave 3 • New total: 2,820 <ul style="list-style-type: none"> ○ Subtract 51 missing on IPV • New total: 2,769 <ul style="list-style-type: none"> ○ Subtract 80 missing on child abuse or age Wave 2 or self-esteem at Wave 2 • New total: 2,689 <ul style="list-style-type: none"> ○ Subtract 742 missing on relationship type at Wave 3 • New total: 1,947 <ul style="list-style-type: none"> ○ Subtract 127 missing on Wave 3 BMI • New total: 1,820 <ul style="list-style-type: none"> ○ Subtract 140 missing on parent education, partner age, relationship duration, or pubertal status <p>FINAL TOTAL: 1,680</p>

Preliminary Analysis Regarding the Inclusion of Potential Control Variables

- Variables were included as controls if they were statistically significant at $p < 0.05$, or theoretically relevant. If a variable was significant at $p < 0.05$ for one gender it was included in models for the other gender for symmetry.
- The analytical sample used for Table 32 is exactly like the analytical sample used in the final analysis, except individuals were also not missing on the variables being tested. Therefore, the number of people differs in both analytical samples.

TABLE 32: Odds ratios (95% Confidence Intervals) from logistic regression of association between Wave 3 IPV Victimization and potential control variables (Paper 2)

	MALES N=1,309	FEMALES N=1,680
Parent Education	0.43** (0.23-0.79)	0.62* (0.41-0.94)
Less Than High School		
Relationship Status Wave 3		
Currently Dating	0.39** (0.22-0.70)	0.49** (0.34-0.71)
Currently Cohabiting	0.90 (0.53-1.52)	1.88** (1.37-2.59)
Currently Married	Referent	Referent
Partner Age Wave 3		
Older	1.55 (0.86-2.80)	1.43 ⁺ (0.94-2.17)
Younger	1.57 (0.91-2.71)	1.83 ⁺ (1.00-3.33)
Same Age	Referent	Referent
Relationship Duration	1.16** (1.07-1.25)	1.17* (1.10-1.24)
Child Abuse	1.83** (1.28-2.63)	1.65** (1.23-2.21)
Perceived Pubertal Status		
Younger Than Peers	1.67* (1.03-2.70)	0.90 (0.57-1.44)
Older Than Peers	1.24 (0.84-1.81)	0.92 (0.68-1.25)
Same As Peers	Referent	Referent
Overweight Wave 3	1.01 (0.66-1.54)	1.61* (1.10-2.35)
Age Wave 2	1.03 (0.89-1.20)	1.00 (0.90-1.10)

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Sensitivity Analysis Regarding the Inclusion of Slightly Underweight Individuals, Paper Two

The tables below show that:

- *Males and females who perceive themselves as somewhat underweight at Wave 2 **do not differ** from all others (those who perceive themselves as about right or overweight/obese) on race, IPV victimization at Wave 3, and parent education.*
- *Males and females who perceive themselves as somewhat underweight at Wave 2 **do differ** from those who perceive themselves as about right or overweight/obese on objective weight at Wave 2.*
(People in the table who perceived themselves as somewhat underweight were not missing on any of the values of interest)

TABLE 33: Weighted Column Proportions, Selected Characteristics by Wave 2 Self-Perceived Weight (Paper 2)

	MALES				FEMALES		
	Somewhat UW Perception N=254	Overwgt./ Obese or Abt. Right Perception N=1,039	Total N=1,293		Somewhat UW Perception N=142	Overwgt./ Obese or Abt. Right Perception N=1,680	Total N=1,822
Race				Race			
NH White	0.84	0.84	0.84	NH White	0.87	0.86	0.86
NH Black	0.16	0.16	0.16	NH Black	0.13	0.14	0.14
Total	1	1	1	Total	1	1	1
IPV W3				IPV W3			
No	0.82	0.78	0.78	No	0.83	0.80	0.80
Yes	0.18	0.22	0.22	Yes	0.17	0.20	0.20
Total	1	1	1	Total	1	1	1
Measured BMI W2**				Measured BMI W2**			
Normal	0.96	0.65	0.71	Normal	0.96	0.74	0.76
Overweight/Obese	0.04	0.35	0.29	Overweight/Obese	0.04	0.26	0.24
Total	1	1	1	Total	1	1	1
Paredu				Paredu			
<HS	0.09	0.11	0.11	<HS	0.16	0.12	0.12
HS_GED	0.27	0.34	0.32	HS_GED	0.33	0.34	0.34
Some college	0.32	0.31	0.32	Some college	0.25	0.30	0.30
College+	0.32	0.24	0.25	College+	0.26	0.24	0.24
Total	1	1	1	Total	1	1	1

* $p < 0.05$, ** $p < 0.01$, *Note:* The analytical sample used for these tables is exactly like the final analytical sample used in Paper 1. However, the analytical sample for this table includes individuals who perceived themselves to be slightly underweight at Wave 2.

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