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APPEARANCE-BASED PREDICTORS OF SUICIDAL BEHAVIOR

by

Cynthia Anne Stockton

A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts

Major: Sociology

The University of Memphis

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ABSTRACT

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The objectives of this study are to determine the effects of weight, weight perception, and physical attractiveness on suicide ideation among adolescents and adults. Further, this research aims to determine whether this effect differs by gender and race.

This study employs the public-use version of the National Longitudinal Study of Adolescent Health, Waves I through IV ($N=6,504$). Odds ratios are estimated to determine whether actual or perceived weight is a better predictor of suicide ideation, and whether measures of interviewer-rated attractiveness or self-rated attractiveness predict suicide ideation. Analyses reveal that perception of self is the most important predictor of suicide ideation. Among white and black adolescents, suicide ideation is more likely to occur among those who perceive that they are of a non-normal weight. Among white and black adults, suicide ideation is more likely to occur among those who perceive that they are “very unattractive” or “unattractive.”

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INTRODUCTION

The classic sociological theorist Émile Durkheim observed stability in suicide rates across the span of time and place in *Suicide: A Study in Sociology* (1897/1951). Based on his observation, Durkheim theorized that rates of suicide should remain relatively stable unless levels of social integration in a given society are low. Trends in suicide rates in United States' adolescents are not characterized by stability. In fact, suicide rates rose by 14% for fifteen to nineteen-year-olds from 1980 to 1996, and in that same span of time, suicide rates in ten to fourteen-year-olds doubled (Whetstone, Morrissey, and Cummings 2007). Even more alarming, suicide is currently the third leading cause of death for children and adolescents ages ten to fourteen, and the fourth leading cause of death for adolescents and young adults ages fifteen to twenty-four according to the Centers for Disease Control and Prevention (CDC 2012).

Identifying antecedent factors of suicidal behavior is a key objective in research on adolescent well-being because potential intervention prior to serious thoughts of suicide (also referred to as suicide ideation) or suicide attempts may prevent subsequent suicidal behavior. Because suicide ideation precedes suicidal action, the aim of this research is to analyze what social factors related to appearance and attractiveness predict suicide ideation and how those factors may differ by gender, and race. A closer examination into what adolescents value may provide valuable information as to what types of factors normally precede suicidal behavior.

Adolescents may believe they have failed to measure up to the stringent attractiveness standards that seem required for social acceptance. Adolescent females who experience greater pressure to obtain and maintain the ideal female body in American culture have the greatest risk of body dissatisfaction associated with negative

emotional consequences (Demarest and Allen 2000; Cohen 2006). Experiencing such pressure amidst feelings of unattractiveness can eventually lead to feelings of hopelessness that increase adolescents' risk of suicide (Page 1992; Falkner et al. 2001; Stewart et al. 2005; Sean et al. 2007).

An ideal of thinness exists for females (Garner et al. 1980), and adolescent females are especially sensitive to cultural expectations in regard to what is considered acceptable (Grogan 2008). Female adolescents are apt to experience appearance culture in "appearance conversations" (Jones and Crawford 2006). Appearance conversations which include "fat talk" reify body ideals and justify the behaviors of weight-based marginalization of those who are overweight (Nichter 2001). During these conversations between females (although they can also occur between males) dissatisfaction with one's body due to (real or perceived) excess body fat is shared in a conversation with another. According to Nichter (2001) female adolescents often console one another, expressing that their friends are not "fat." It is through these talks that having excess body fat is reified as a normal and culturally acceptable form of stigmatization.

Although most body dissatisfaction research examines female populations, males are also at risk for the consequences of poor body image. Hegemonic ideals of what the shape and size of the body "should be" also influence males, and such influences should not be overlooked. In adolescent peer appearance culture, via appearance conversations specified to be "muscle talk," males express concerns about muscularity (Jones and Crawford 2006); further, instead of consoling one another about the personal dissatisfaction that is being experienced, males often tease their underweight peers about

their appearance (Jones and Crawford 2006). Again, this is associated with both real and perceived lack of muscularity.

In addition to gender nuances, body ideals differ by adolescents' racial identities. Research finds cultural differences between white and black adolescents establish distinct variations in body ideals. Body ideals are mainly influenced by parents for white adolescents, but friends and peers mainly establish body ideals for black female adolescents (Nollen et al. 2006). Studies of body image have found that black female adolescents seem to be more protected against general influences of negative body image than their white counterparts. Paxton et al. (2006) found that black female adolescents are more satisfied with their body image, despite obesity's greater prevalence among blacks. However, evidence shows that obesity rates among black adolescents at risk for body dissatisfaction are growing. Moreover, being overweight and being a racial minority is associated with negative body image in adulthood (Gortmaker et al. 2003). These varying characterizations of body ideals merit investigating relationships among body weight, weight perception, other measures of attractiveness, and suicide ideation in white and black males and females.

Theoretical Contributions

Although Durkheim dismissed individual, private experiences as an explanation for suicide rates, modern research suggests otherwise. For many females, being overweight is associated with suicide ideation (Swahn, Reynolds, and Tice 2009) though being underweight is associated with suicidal behavior in adult males (Carpenter et al. 2000). However, individual perception is perhaps more important than reality when it comes to body image and suicide. Researchers have found that self-perception of

physical appearance is an influential factor leading to suicide ideation in adolescents (Eaton, Lowry, and Brenner 2005) and experiencing weight-related stigma is associated with suicidal behavior (Eisenberg, Neumark-Sztainer, and Story 2003). These findings may explain the higher suicide ideation rates among adolescents who perceive they are overweight. Scientific inquiry into adolescents' personal interpretation of appearance and statistical analysis factors exacerbating the risk of suicide ideation are needed.

Goffman's (1963) Stigma

The stigmatized in relation to the "normals"

According to Goffman (1963), stigma is a sign that labels the bearer as "spoiled" and therefore as valued less than "normal" people. He distinguishes between the stigmatized and the 'normal' as though a clear delineation between the two categories exists. Goffman asserts that stigmatized individuals display 'stigma symbols,' which he defines as, "[s]igns which are especially effective in drawing attention to a debasing identity discrepancy, breaking up what would otherwise be a coherent overall picture, with a consequent reduction in our valuation of the individual" (1963:43-44). However, when body fat is the stigma symbol, how is the boundary between stigmatized individuals and 'normals' determined? How much body fat is too much? Might institutionalized measures of obesity assist in the delineation of those who are normal versus those who are not?

Obesity as an "abomination of the body"

Goffman (1963) identified three types of stigma or stigmatizing conditions: "abominations of the body," "blemishes of individual character," and "tribal identities." Although Goffman did not specifically discuss obesity as a physical stigma, obesity is

one type of "abomination of the body" which is particularly affected by cultural definitions. Physiologically based definitions of obesity vary, and definitions of beauty-where obesity may or may not be discrediting-are particularly liable to cultural and historical variation. Goffman (1963:3-4) emphasizes that although stigma might be seen in terms of individual characteristics, "a language of relationships, not attributes is really needed." The concept of derision targets the spoiled identity of the socially "fat" individual, rather than his or her actions, specifically. In other words, the social meaning of obesity is derived in interaction with others, not from the attribute alone.

Overweight and obese individuals can't "pass"

Those individuals are what Goffman (1963:4) termed "discreditable," as they are in danger of being devalued if their stigma is known. Other attributes, such as obesity, provide visible cues to stigma: their bearers are discredited. It is for this reason that Goffman's further distinction of discrediting features that are or are not visible to others is relevant to the study of obesity. For stigmatization to occur, the discrediting attribute must be known by the others with whom interaction takes place. The obese cannot "pass" as thin; they must either lose weight or remain stigmatized. Those individuals who have visible stigmas are unable to hide their attributes; this is important because the stigma provides the first characteristic upon which others base their assumptions and expectations about the individual. In other words, people who have visible stigma are already "discredited" and devalued even before the social interaction has begun (Goffman 1963). In contrast, individuals with concealable stigma, such as religion or sexual orientation, are capable of having interactions with others without such negative associations of stigma tainting the expectations and fluidity of the social interaction.

Nevertheless, people who possess concealable stigma are cognizant of the fact that the stigmatized characteristic they possess would result in their being stigmatized if it is ever discovered.

Diet and lifestyle are considered to be aspects of human experience that are under the locus of control of actors, and this supports Goffman's (1963:11) claim that those who feel that others consider them to be lacking responsibility for self leads to interpersonal feelings of being "...reduced...from a whole and usual person to a tainted or discounted one," thus arousing stigmatization from others.

Modern Theories on Stigma

Although most research on suicide uses the theoretical work of Durkheim, other theoretical perspectives may better help explain the links among weight, weight perception, and suicidal behaviors.

Jones et al. (1984) on Stigma

Based on Goffman's (1963) classic work, *Stigma*, Jones and colleagues (1984) using a different approach identified six types of stigmatizing conditions: (1) "concealability," refers to the extent to which the stigmatizing mark is visible; (2) "course of mark," refers to whether the mark may become more salient or progressively debilitating over time; (3) "disruptiveness," refers to the degree that the stigmatizing characteristic interferes with the flow of interpersonal interactions; (4) "aesthetics," refers to the subjective reactions to the ugliness of the stigma; (5) "origin," of the stigmatizing mark; and (6) "peril," involves the perceived danger of the stigmatizing condition to others. According to Jones and colleagues (1984), the most important dimensions in this approach are peril (perceived danger of the stigma), concealability (the visibility of the

stigma), and origin (the controllability of the stigma). For weight stigma, arguably the most important dimensions are visibility and controllability. Hence, the individual who is overweight or obese is subjected to discrimination, prejudice, and stigmatization and blamed for the lack of self-control causing the overweight and/or obesity.

Link and Phelan (2001) on Stigma

Link and Phelan (2001) drew upon the definition advanced by Goffman (1963) to develop further a definition of stigma that describes it as existing if certain elements of stereotyping, labeling, status loss, and prejudice occur in a situation characterized by power differences. They contribute to the study of stigma by focusing on the power relations involved in the examination of stigma. Specifically, they propose that the existence of power is crucial to the stigma process, which is entirely dependent upon social, economic, and political power necessary to impose discriminatory experiences on the stigmatized. With regard to discrimination, Link and Phelan (2001) argue that the types of discrimination associated with stigma are direct discrimination, structural discrimination, and internalized discrimination. Link and Phelan (2001) also argue that stigma exists as a matter of degree and that the extent of status loss and discrimination can vary.

According to Link and Phelan (2001), the first component of stigma suggests that most human differences are overlooked and do not matter socially, but some differences are identified and are salient. This process requires a significant level of oversimplification of categories and reflects the dominant values and power structures in the society.

Although one could argue that weight is not a nominal descriptor because it is based on scalar measurement (i.e. pounds, ounces, or even a score on a body-mass-index scale), might the ordinal distinctions between “normal weight” and “overweight” or “obese” (based on categorical distinctions) be enough to fit this group membership in with Ridgeway’s conception of status beliefs? I argue that this is conceptually viable. To elaborate, consider Link and Phelan’s second component.

The second component, “stereotyping,” involves the linking of negative attributes with the identified characteristic, thereby making it easy to view the labeled individuals as fundamentally different from the rest of society. Obese individuals are described as being impulsive, lazy, lacking willpower, motivation, and personal control (Puhl and Brownell 2001). Many socially "fat" individuals experience being stereotyped as lazy, negligent, or unmotivated to make necessary changes for healthy weight management. Susan Bordo supports this idea. She describes the ideal of the Western beauty ideal for femininity as a "tightly managed body, with a slim, smooth, contained body profile (Bordo 1993). The opposite is true for the non-ideal who tends to portray "uncontained desire, unrestrained hunger, uncontrolled impulse" (Bordo 1993:189).

The third component “separation of ‘us from them,’” allows people to attribute negative qualities to those who are labeled. One way in which stigmatized individuals are separated is by referring to them by their label and, thereby de-humanizing them. People in American society freely express negative or prejudicial attitudes toward overweight or obese individuals with the notion that these attitudes are acceptable because weight is controllable (Crandall 1994). Rather than “doing for themselves,” however, socially "fat"

individuals are perceived as those who need effort to be put forth for them to be in reach of a healthier and more ideal body.

Finally, the fourth component of stigma “status loss and discrimination” results when people are labeled and given negative attributes. Weight bias has been described as the last acceptable form of discrimination (Stunkard and Sorensen 1993). It has been shown that obese and overweight individuals have fewer opportunities to participate in social activities, are more likely to encounter discriminations and prejudice in the fields of employment, education, and reported having fewer intimate or successful long-term relationships (McLaren and Kuh 2004).

Stigmatization and discrimination of the obese and overweight

According results from a longitudinal study performed by researchers Andreyeva, Puhl, and Brownell (2008), the prevalence of weight discrimination increased from 7.3% in 1995-1996 to 12.2% in 2004-2006. Further, evidence of weight prejudice exists in the spheres of employment, health care, and education (Puhl and Brownell 2001). Not surprisingly, an inverse relationship between body weight and social status exists for females (Falkner et al. 2001). For women, maintaining their body weight within a certain margin does represents conformity to a moral health standard, and it is also a means to achieve greater social status and personal value (Moore 2010). Truly, it seems that individuals who are overweight or obese are stigmatized and discriminated against in nearly every aspect of their lives, and this seems especially salient for females.

Internalization of Stigma

Experiences of stigmatization in society can eventually lead to self-stigmatization. Self-stigma mitigates personal experiences of reduced self-worth, increased fear of

stigmatization, and greater shame and guilt (Van Brakel 2006:308). This can occur either consciously or subconsciously, and describes the state in which the stigmatized individual accepts blame for stigmatization, fear of stigmatization, and overall diminished expectations due to stigmatization.

Goffman uses the term shame to describe the emotion that discreditable individuals experience (Goffman 1963). Socially "fat" individuals often also experience the negative emotions of guilt and shame. In theories of social control, shame is used to punish acts that break normative order in society. Unlike guilt, which is more related to behavioral acts, shame degrades self-identity. As a primary human emotion, shame is a powerful means by which normative moral order is legitimated in society and internalized subjectively (Scheff 2003). To exemplify how shame targets the identity and the perception of self rather than targeting specific actions, consider the following example. Rather than describing over-eating as an act of "consuming more than health recommendations suggest," an overeater is labeled a "glutton." Social experiences of stigmatization are common for obese individuals. Such stigmatization for being overweight or obese has been found to be associated with low self-acceptance (Carr and Friedman 2005). Crocker and Major (1989) initially examined traditional theories for explaining the effects of social stigma on self-esteem that can be applied to overweight and obese individuals. Reflected appraisals or the "looking glass self" view, states that the self-concept develops through interactions with others and is a reflection of other's appraisals of oneself. According to this theory, members of stigmatized groups such as overweight individuals who know they are regarded negatively by others incorporate those negative attitudes into their self-concept and consequently have lower self-esteem

(Crocker and Major 1989). Another traditional view is the self-fulfilling prophecy that occurs when the stigmatizer or perceiver acts on his or her false beliefs about an individual or target in a manner that those beliefs come to be confirmed by the behavior of the individual or target. In other words, stigmatizers hold negative views about overweight or obese individuals who may alter their behavior to be consistent with the negative stereotypes.

Unattractiveness as another Appearance-Based Stigma

This research goes beyond weight and weight perception to examine appearance in terms of attractiveness, and the two measures of attractiveness that this research employs are described in greater detail in the measures section of this thesis. The reasons that this thesis employs measures of attractiveness are justified theoretically. For example, lacking "normal" features of physical attractiveness may be considered to be "non-normals" just as are those who are considered to be out of the institutionally prescribed definition for a normal weight.

Further, physical attractiveness is another measure which is available for analysis that relates to Goffman's (1963) visible stigmas, but an important issue to consider when thinking about whether lacking typical features of physical attractiveness might predict suicide ideation is the issue of blame. Would stigmatizers blame those who are not physically attractive for their appearance? Perhaps those who lack features of physical attractiveness do face similar issues of discrimination and stigmatization as those who deal with weight-based discrimination and stigma which may lead to the internalization of such stigma.

Might the importance of physical attractiveness be more prevalent in adolescence versus adulthood, and might overall physical attractiveness surpass body weight and shape as a predictor of suicidal behavior? To address this question using available data, this thesis examines whether measures of attractiveness as measured by another and measures of attractiveness as rated by the individual predict suicide ideation in the same ways as weight and weight perception.

As previously stated, excess body weight during adolescence is one risk factor for suicide that deserves increased public attention. The shape and size of the body is of great concern for adolescents; rapid pubescent development and appearance preoccupation norms characterize adolescent experience and culture (Jones and Crawford 2006). However, is actual weight what adolescents are concerned with? Or are they more concerned with how they believe their peers will interpret their weight in terms of physical attractiveness? Inconsistencies in research findings on suicidal behavior and its relation to body weight/weight perception reveal shortcomings in current research and highlights the need for further investigation in this area. As well, other possible parameters of attractiveness should be examined. This study uses nationally representative longitudinal data to analyze the relationships among physical weight, self-perceived weight, and suicidal ideation. In addition, it will analyze the relationships among rated physical attractiveness from another as well as physical attractiveness as it is personally interpreted to determine if these factors predict suicidal ideation as well. The aim of the present study is to examine the following questions: Do social markers of physical attractiveness lead to experiences that significantly influence the risk of suicide

ideation? Does this differ for adolescents and adults? How do gender and race influence these outcomes?

RESEARCH METHODOLOGY

Research Design

The research in this thesis employs public-use data from the National Longitudinal Study of Adolescent Health (henceforth referred to as Add Health), presently existing in four waves of data. Add Health is a longitudinal, nationally representative survey of American students in the 7th-12th grades, attending private and public schools. Add Health data were collected during the fall and spring semesters of school in 1994-1995, 1996, 2001-2002, and 2007-2008 and these periodic studies are referred to as Wave I, Wave II, Wave III, and Wave IV, respectively (Harris et al. 2009).

Wave I of Add Health includes an in-school survey which screened over ninety thousand participants with questions ranging from general demographics to health behaviors. Of those students, 27,000 were randomly selected to participate in in-home interviews, and of those who were selected, 20,746 participated. The in-home interviews were conducted via Computer-Assisted Personal Interviews (CAPI) and asked questions dealing with general health status, risk-taking behaviors, family composition, and general attitudes of respondents. For questions that were particularly sensitive or personal in nature, respondents heard the question via headphones using Computer-Assisted Self Interviews (CASI). Questions relating to suicidal behavior in the previous year were administered using CASI, and this allowed respondents to enter their responses without the interviewer's knowledge of questions or responses entered.

After the initial Wave I study, the students were followed up with other in-home surveys in Wave II, Wave III, and Wave IV, Waves II, III, and IV asked many of the same questions included in Wave I. Wave II data were collected between April and August of 1996. Respondents who were in the twelfth grade during Wave I were not surveyed in Wave II. They were included in subsequent waves though. Wave III of data collection occurred in 2001-2002, and included a sample of respondents, ages 18 to 26. Questions from Wave III highlighted health related behaviors as well as factors related to the transition into adulthood. Such topics included respondents' experiences in work, education, romantic relationship involvement, and parenting. Wave IV of data collection occurred in 2007 and 2008 and included a sample of respondents ages 24 to 34.

Oversamples of certain populations are present in the current analytic sample. For example, Add Health oversampled groups such as black respondents who have at least one parent with a college degree and respondents who are twins were oversampled. This study employs sample weights to produce nationally representative estimates for each wave of data. Data management and statistical analysis are performed using the SPSS Complex Sampling procedure, and adjustments for oversampling are accounted for by using appropriate sample weights and primary sampling units described in Add Health codebooks and the manual for dealing with design effects (Bearman, Jones, and Udry 2012). This controls for design effects, and allows appropriate standard errors to be estimated.

As stated above, this research uses public-use data from all four waves. The distribution of respondents' biological sex by wave for the total public-use sample is displayed in Table 1.

Biological Sex	Wave I	Wave II	Wave III	Wave IV
Male	50.8%	50.7%	50.7%	50.5%
Female	49.2%	49.3%	49.3%	49.5%
Number of Observations, Unweighted	6,503	4,834	4,882	5,113

Measures

Suicide ideation

This research endeavors to evaluate the risk of suicidal behaviors before they occur. This is important because an attempt of suicide could result in death, where the potential for the application of professional intervention to deter the behavior from occurring again is no longer possible. Therefore, this study takes advantage of an antecedent factor for suicide attempt, suicide ideation.

To measure suicide ideation in all four waves of data, respondents were asked, “Did you seriously consider committing suicide in the previous twelve months?” Possible responses were limited to “yes” or “no” and consequently, suicide ideation, the dependent variable, is dichotomous. The frequencies of reported suicide ideation in the previous twelve months for each wave of data are displayed by gender in Table 2.

	Males	Females
Wave I		
No Ideation in Past Year	89.9%	84.2%
Ideation in Past Year	10.1%	15.8%
Number of Observations, Unweighted	3,103	3,332

Table 2 (Continued): Suicide Ideation in Previous 12 Months (Weighted), Add Health Waves I-IV

	Males	Females
Wave II		
No Ideation in Past Year	92.0%	85.60%
Ideation in Past Year	8.0%	14.4%
Number of Observations, Unweighted	2,289	2,510
Wave III		
No Ideation in Past Year	93.6%	93.10%
Ideation in Past Year	6.4%	6.9%
Number of Observations, Unweighted	2,180	2,571
Wave IV		
No Ideation in Past Year	94.1%	93.00%
Ideation in Past Year	5.9%	7.0%
Number of Observations, Unweighted	2,319	2,755

Self-rated attractiveness and interviewer-rated attractiveness

To measure physical attractiveness in the Add Health study, interviewers rated the physical attractiveness of respondents, and respondents rated themselves (however, self-rated attractiveness measures were only taken in Wave III and Wave IV). In the current research, physical attractiveness as rated by the respondent is referred to as “self-rated attractiveness,” and physical attractiveness as rated by the interviewer is referred to as “interviewer-rated attractiveness.”

In all four waves of data, interviewers were asked the following: “How physically attractive is the respondent?” Interviewer-rated attractiveness is measured on this five point scale, with answer choices ranging from “very unattractive,” “unattractive,” “about average,” “attractive,” to “very attractive.” The current study collapses the interview-

rated attractiveness categories into three categories: (1) “very unattractive” and “unattractive,” (2) “about average,” and (3) “attractive” and “very attractive.”

To measure self-rated attractiveness in Wave III and Wave IV of the Add Health study, respondents were asked the following: “How attractive are you?” The answer choices ranged from “not at all attractive,” “slightly attractive,” “moderately attractive,” to “very attractive.” Note that these answer choices from this four-point scale measure self-rated attractiveness without a clear neutral category. The current study collapses the self-rated attractiveness categories into three categories: (1) “not at all attractive” and “slightly attractive;” (2) “moderately attractive,” and (3) “very attractive.” The frequencies of respondents within each category of interviewer-rated attractiveness self-rated attractiveness from each wave of data are also displayed by gender in Table 3.

Table 3: Interviewer-Rated Attractiveness and Self-Rated Attractiveness of Respondents (Weighted), Add Health Waves I-IV

	Males	Females
INTERVIEWER-RATED ATTRACTIVENESS		
<u>Wave I</u>		
Very Unattractive & Unattractive	7.0%	5.6%
About Average	49.7%	36.1%
Attractive & Very Attractive	43.3%	58.2%
Number of Observations, Unweighted	3,141	3,353
<u>Wave II</u>		
Very Unattractive & Unattractive	6.0%	4.6%
About Average	52.4%	41.7%
Attractive & Very Attractive	41.6%	53.7%
Number of Observations, Unweighted	2,309	2,517

Table 3 (Continued): Interviewer-Rated Attractiveness and Self-Rated Attractiveness of Respondents (Weighted), Add Health Waves I-IV

	Males	Females
<u>Wave III</u>		
Very Unattractive & Unattractive	6.7%	6.4%
About Average	52.7%	40.6%
Attractive & Very Attractive	40.6%	52.9%
Number of Observations, Unweighted	2,253	2,624
<u>Wave IV</u>		
Very Unattractive & Unattractive	7.3%	7.7%
About Average	50.9%	44.2%
Attractive & Very Attractive	41.8%	48.1%
Number of Observations, Unweighted	2,349	2,759
SELF-RATED ATTRACTIVENESS		
<u>Wave III</u>		
Not at all Attractive & Slightly Attractive	18.6%	20.4%
Moderately Attractive	54.0%	55.3%
Very Attractive	27.4%	24.3%
Number of Observations, Unweighted	2,184	2,570
<u>Wave IV</u>		
Not at all Attractive & Slightly Attractive	33.7%	33.6%
Moderately Attractive	49.4%	53.3%
Very Attractive	16.9%	13.1%
Number of Observations, Unweighted	2,345	2,754

Body mass index

The Body Mass Index (BMI) is a frequently employed measure for determining if one is underweight, at a normal weight, overweight, or obese. This research uses the method of calculating body mass index for adults and non-adults, according to the guidelines suggested by the Centers for Disease Control and Prevention (2011).

The Centers for Disease Control and Prevention (2011) offer a “BMI Percentile Calculator for Children and Teens” on their website, cdc.gov. The calculator takes height, weight, age, and gender into consideration, and yields a percentile measurement rather than a standard BMI unit as previously described. These percentiles are used to determine how a particular adolescent’s BMI compares to his or her peer population. This allows for a more sensitive and appropriate categorization for comparative purposes. In the current study, based upon gender, age in months, and BMI, adolescents are classified as “underweight,” “normal weight,” “overweight,” or “obese,” according to the Centers of Disease Control and Prevention (2011) guidelines.

Calculating BMI in respondents 19 years of age and younger

The calculation of BMI for respondents who are under 20 years of age includes considerations of height, weight, age, and gender. The computation of BMI for persons who are 19 years of age or younger is employs the same equation used for those age 20 and older: $(\text{weight (lb.)} / [\text{height (in.)}]^2 \times 703)$, but BMI class categorization is based on respondents’ BMI values in comparison to their counterparts of the same age and sex, and it is based on percentiles so that BMI represents whether one is underweight, at a normal weight, overweight, or obese *in relation to* his or her peers. These considerations are included for those under the age of 20 because body fat percentages change with age, and normal ranges are different for males and females of different ages.

In the following chart, weight status categories are presented for children and adolescents according to the resulting percentile from the calculator:

<u>Body Mass Index Category</u>	<u>Body Mass Index Percentile</u>
Underweight	Below 5 th Percentile
Normal weight	5 th -85 th Percentile
Overweight	85 th - 95 th Percentile
Obese	95 th Percentile and Above

Calculating BMI in respondents 20 years of age and older

The calculation of BMI for respondents ages 20 and older includes considerations height and weight only. It does not take age or sex into consideration. The formula for calculating BMI in those ages 20 and older is the same as the formula for those under the age of 20 [(weight in lbs.) / (height in inches)]² * 703. In the following chart, weight status categories are presented for adults:

<u>Body Mass Index Category</u>	<u>Body Mass Index Score Range</u>
Underweight	Below 18.5
Normal weight	18.5 – 24.9
Overweight	25.0 – 29.9
Obese	30.0 and Above

To illustrate, using the above categories, an adolescent who has a BMI that equals or exceeds the 85th percentile, but is lower than the 95th percentile, is considered overweight. Likewise, a child or adolescent that has a BMI that equals or exceeds the 95th percentile is considered obese (CDC 2011).

Following are four examples (2 examples using adults, and 2 examples using non-adults) to illustrate further how the calculations of BMI are interpreted differently for adults and adolescent. Using the equation for body mass index and the charts described above: (1) a male *or* female adult who is 6 feet tall and weighs 200 pounds would have a BMI of 27.12 and would be considered to be overweight; (2) a male *or* female adult who

is 5 feet tall and weighs 110 pounds would have a BMI of 21.5 and would be considered to have a normal weight; (3) an adolescent female who is exactly 12 years old, 5 feet tall, and weighs 110 pounds would have a BMI 21.5 (in the 84th percentile of the same sex, same age adolescents) of and would be considered to have a normal weight; and (4) an adolescent male who is exactly 12 years old, 5 feet tall, and weighs 110 pounds would have a BMI 21.5 (in the 87th percentile of the same sex, same age adolescents) of and would be considered to be overweight. In Table 4, the classifications for body mass index categories for male and female adults and adolescents of the same height and weight are displayed.

Sex	Age	Height	Weight	Body Mass Index
Male	20 Years or Older	5 feet, 0 inches	110 pounds	21.5 (Normal)
Female	20 Years or Older	5 feet, 0 inches	110 pounds	21.5 (Normal)
Male	12 Years Old	5 feet, 0 inches	110 pounds	21.5 (87 th Percentile: Overweight)
Female	12 Years Old	5 feet, 0 inches	110 pounds	21.5 (84 th Percentile: Normal)

Body mass index in Add Health

Recall that weight and height was only self-reported in Wave I, whereas it was measured by interviewers in the subsequent waves of data. This is important to consider when interpreting the results of this study because the body-mass-index categories for Wave I respondents are not necessarily as precise as those of Waves II, III, and IV. Research does show that reported weight is satisfactory to use (Dibley et al. 2010),

however, and for this reason, Wave I BMI is computed in this research despite the fact that weight and height figures are self-reported.

Interviewers were instructed to confirm respondents' biological sex, and each respondent was asked "What is your birth date? [month and year]." To calculate age in the current study, month and year of birth is subtracted from the month and year that the interview took place, creating a new variable reflecting respondents' age. The frequencies of respondents within each body mass index category from Waves I-IV are displayed by gender Table 5.

Table 5: Body Mass Index (BMI) Categories (Weighted), Add Health Waves I-IV

	Males	Females
<u>Wave I</u>		
Underweight	13.1%	15.3%
Normal Weight	63.6%	65.0%
Overweight	17.2%	13.9%
Obese	6.1%	5.9%
Number of Observations, Unweighted	3,086	3,204
<u>Wave II</u>		
Underweight	12.9%	13.8%
Normal Weight	61.2%	61.8%
Overweight	16.8%	14.5%
Obese	9.2%	9.9%
Number of Observations, Unweighted	2,287	2,462

Table 5 (Continued): Body Mass Index (BMI) Categories (Weighted), Add Health Waves I-IV

	Males	Females
<u>Wave III</u>		
Underweight	2.1%	3.2%
Normal Weight	44.1%	48.0%
Overweight	30.8%	24.1%
Obese	22.9%	24.8%
Number of Observations, Unweighted	2,150	2,460
<u>Wave IV</u>		
	Males	Females
Normal Weight	30.3%	38.1%
Overweight	39.0%	25.8%
Obese	30.0%	33.8%
Number of Observations, Unweighted	2,304	2,685

Weight perception

Weight perception is the self-reported measure of how someone perceives his or her body weight. It is necessary to note that the measurement of weight perception is subjective, and may be incongruent with reality (Brener et al. 2004). For example, a male who thinks he should weigh a little less may say that he is “slightly overweight,” even though his body mass index does not reflect that he is overweight. Conversely, a female who thinks she is a normal weight may report that her weight is “about right,” although she is actually underweight by body mass index guidelines.

To measure weight perception, in the Add Health study, respondents were asked, “How do you think of yourself in terms of weight?” The answer choices ranged from “very underweight,” “slightly underweight,” “about the right weight,” “slightly

overweight,” and “very overweight.” Due to a limited number of respondents some sub-categories in the analytic sample of the current research, the variable of weight perception is recoded into three categories: “underweight,” “about the right weight,” and “overweight.” The categories of “very underweight” and “slightly underweight” are collapsed into the category of “underweight.” “About the right weight,” remains in its own category, and “slightly overweight” and “very overweight” are collapsed into the category of “overweight.” The frequencies of respondents within each category of weight perception from each wave of data are displayed by gender in Table 6.

Table 6: Weight Perception of Respondents (Weighted), Add Health Waves I-IV

	Males	Females
<u>Wave I</u>		
Underweight	22.6%	10.2%
About the Right Weight	54.6%	49.1%
Overweight	22.7%	40.7%
Number of Observations, Unweighted	3,140	3,350
<u>Wave II</u>		
Underweight	20.4%	10.9%
About the Right Weight	56.6%	49.5%
Overweight	22.9%	39.6%
Number of Observations, Unweighted	2,312	2,517
<u>Wave III</u>		
Underweight	17.1%	6.0%
About the Right Weight	52.5%	43.8%
Overweight	30.4%	50.1%
Number of Observations, Unweighted	2,252	2,625
<u>Wave IV</u>		
Underweight	11.7%	4.8%
About the Right Weight	39.4%	30.0%
Overweight	48.8%	65.2%
Number of Observations, Unweighted	2,353	2,758

Statistical Agreement between Measures

Cohen's Kappa statistics are used to test the reliability of the measures of actual weight and weight perception as well as interviewer-rated and self-rated attractiveness measures in male and female respondents. To produce Cohen's Kappa coefficients, two variables with the same number of categories are compared for overall reliability of responses among cases. 0.00 through 0.20 is considered slight, 0.21 through 0.40 is considered fair, 0.41 through 0.60 is considered moderate, 0.61 to 0.80 is considered substantial, and 0.81 to 1.00 are considered to be close to perfect in terms of reliability (Landis and Koch 1977).

To assess the degree of agreement between body-mass-index and weight perception, body-mass-index is recoded from a 4 category variable (underweight, normal weight, overweight, and obese) into a three category variable by combining overweight and obese to represent any actual weight which is considered over the normal weight according to the CDC (2011). Interviewer-rated attractiveness and self-perceived attractiveness are coded in the same way that was described in the measures section of this paper (each variable has three categories, with the lowest value representing the least attractive measure, and the highest value representing the most attractive measure).

The complex sampling procedure in SPSS does not calculate and present Cohen's Kappa statistics via cross-tabulations. To produce accurate Cohen's Kappa statistic estimates, cases are limited to those which have valid responses for the key independent variables. Second, the mean is calculated for the grand sample weight variable according to which wave is being analyzed. Next, a new weight is computed by dividing the grand sample weight by the mean of that weight. Then, after the new weight is applied, a cross-

tabulation can be produced displaying Cohen's Kappa coefficients with valid standard errors and statistical significance estimates. The Cohen's Kappa coefficients are presented in Table 7, and are organized by the variables being compared and the wave in which they were measured.

Table 7: Reliability Analysis of Key Independent Variables Using Cohen's Kappa Statistic

	Males			Females		
	Value	S.E.	Sig.	Value	S.E.	Sig.
Body Mass Index & Weight Perception						
Wave I	0.37	0.01	***	0.35	0.01	***
Wave II	0.39	0.02	***	0.42	0.02	***
Wave III	0.31	0.01	***	0.59	0.02	***
Wave IV	0.34	0.01	***	0.59	0.02	***
Interviewer-Rated Attractiveness & Self-Rated Attractiveness						
Wave III	-0.07	0.02	***	-0.15	0.02	***
Wave IV	0.00	0.01		-0.05	0.01	**

Based on the values of Cohen's Kappa, the extent to which actual and perceived weight are in agreement is fair to moderate for males and females in all four waves. The Cohen's Kappa coefficient of interviewer-rated attractiveness and self-rated attractiveness among females in Wave III is -0.15, and the Cohen's Kappa coefficient of interviewer-rated attractiveness and self-rated attractiveness among males in Wave III is -0.07. The Cohen's Kappa coefficient of interviewer-rated attractiveness and self-rated attractiveness among females in Wave IV is -0.05, and the Cohen's Kappa coefficient of interviewer-

rated attractiveness and self-rated attractiveness among males in Wave IV is 0.00, though this value is not statistically significant.

Presentation of Results

Results for this research study are presented in the following tables and text. In the tables, all results for each model for each wave of data are presented by racial groups and gender. In the text following those tables, results are discussed according to the final models from each analysis by variable. For example, any findings where interviewer-rated attractiveness scores significantly predicted higher or lower odds of suicide ideation in the final model for any of the subset populations (i.e. white males, black males, white females, and black females) is discussed first. Then, any results where self-rated attractiveness scores significantly predicted higher or lower odds of suicide ideation in the final model for all subset populations of respondents are discussed next. Following that is a discussion of results regarding body mass index, and then weight perception for any significant findings for all subset populations in the final model. At the end of this section is a comprehensive table where the overall results are displayed for all four waves of data.

In some of the following models, the sample size of those who ideated about suicide in the previous year fell below the acceptable percentage when modeling odds ratios for specific sub-populations. To analyze variation among these groups properly, a specific portion of respondents who report ideating about suicide from each category and sub-category is required. This research only reports odds ratios for sub-samples with a minimum of 5% of respondents from a category which represents having ideated about suicide in the previous year. This percentage of respondents who reported ideating about

suicide in the previous twelve months was not achieved for black males or females in Wave II, nor was it achieved for black male respondents of Wave IV. Only 4.7% and 4.9% of black males and females, respectively, ideated about suicide in the previous twelve months in the public-use Wave II sample, and only 3.0% of black male respondents ideated about suicide in Wave IV, public-use. As well, no black male respondents that were rated as “very unattractive” or “unattractive” ideated about suicide, so the odds ratio for that category is not reported. For example, note the “XX” in place of odds ratio and standard error estimates in Wave II, Table 15 and 16, Models 2 and 4, “very unattractive” and “unattractive.” The “XX” takes the place of estimates that where certainty of the estimates could not be determined due to cell counts less than 5% of the sub-populations, black males and females. Due to these and other sample size limitations, the analytic sample in this study only consists white and black males and females from each wave of Add Health.

How to read Tables 8-14

Within each race/gender category there are three columns. The first column, labeled, "Zero Order," contains the separate logistic regressions for each independent variable enclosed in boxes with thick black borders. In other words, the first row in the first box in the first Zero Order column presents the suicide ideation odds ratios comparing interview-rated attractiveness category "very unattractive" and "unattractive," wherein only odds ratios for respondents with interviewer-rated "very unattractive" and "unattractive," are presented with no other variables or controls in the model.

The second column labeled, "Paired Analysis," contains the separate logistic regressions for each combination of independent variables enclosed in other boxes with

thick black borders. In other words, these estimates presented in the Paired Analysis column represent the odds ratios for a model which includes both of the variables in the box, with no other variables or controls. For example, in Table 8, under the first Paired Analysis column, the thick black box outlines the resulting odds ratio estimates for a model that includes both body-mass-index (actual weight) and weight perception (perception of weight) in the model for Wave I white males.

The third column labeled "Final Model," is entirely outlined in a thick black box because it represents a model where all independent variables and controls are included in the analysis. For example, in Table 8, in the first Final Model column, odds ratio estimates for a model that include body mass index categories (actual weight), weight perception, and interviewer-rated attractiveness.

How to read Table 15

Table 15 is the final table. Table 15 is provided as a guide for readers to help sum up the results from each Final Model of results from Wave I, Wave II, Wave III, and Wave IV. There are similarities and differences that Table 15 shares with the other tables, and these are described below.

As in other models, rows where two X's (XX) that intersect a race/sex category under a specific wave of data and variable category (i.e. "black males, Wave 2, Very Unattractive & Unattractive") indicate that less than 5% of the respondents in that category ideated about suicide in the past year, and odds ratio estimates are not certain (less than 5% of black male respondents who were categorized as either "very unattractive" or "unattractive" ideated about suicide in the previous year).

There are two major differences in Table 15 from other tables where odds ratios are described. First, instead of asterisks representing levels of statistical significance, only one asterisk is used to note that for the row variable, there is a statistically significant increase in the odds of suicide ideation. Second, the tilde symbol is used in Table 15. A tilde (~) that intersects a race/sex category under a specific wave of data and variable category indicates a statistically significant decrease in the odds of suicide ideation for the row variable.

Table 8: Odds Ratios Predicting Suicide Ideation among White and Black Males (Weighted), Wave I

	WHITE MALES									BLACK MALES								
	Zero Order			Paired Analysis			Full Model			Zero Order			Paired Analysis			Full Model		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>																		
Very Unattractive & Unattractive	1.53	0.33					1.51	0.34		0.49	0.71					0.46	0.83	
About Average	1.18	0.18					1.15	0.18		0.83	0.45					0.88	0.44	
Attractive & Very Attractive (Reference)	---	---	---				---	---	---	---	---	---				---	---	---
<u>Body Mass Index Category</u>																		
Underweight	0.83	0.24		0.78	0.25		0.78	0.25		1.33	0.54		1.04	0.57		1.08	0.57	
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight	0.77	0.27		0.50	0.28	*	0.50	0.28	*	1.42	0.49		2.22	0.55		2.22	0.55	
Obese	1.01	0.35		0.53	0.40		0.50	0.40		2.08	0.70		3.98	0.59	*	4.31	0.66	*
<u>Weight Perception</u>																		
Very Underweight & Slightly Underweight	1.57	0.20	*	1.59	0.21	*	1.57	0.20	*	2.48	0.48		3.07	0.49	*	3.04	0.48	*
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	1.90	0.20	**	2.60	0.22	***	2.58	0.22	***	1.27	0.58		0.68	0.56		0.68	0.55	
Number of Observations, Unweighted	1,835			1,835			1,835			703			703			703		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave I.

Source: The National Longitudinal Study of Adolescent Health

Table 9: Odds Ratios Predicting Suicide Ideation among White and Black Females (Weighted), Wave I

	WHITE FEMALES									BLACK FEMALES								
	Zero Order			Paired Analysis			Full Model			Zero Order			Paired Analysis			Full Model		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>																		
Very Unattractive & Unattractive	1.38	0.25					1.03	0.28		1.27	0.42					1.31	0.41	
About Average	1.13	0.14					1.00	0.15		1.17	0.31					1.20	0.32	
Attractive & Very Attractive (Reference)	---	---	---				---	---	---	---	---	---				---	---	---
<u>Body Mass Index Category</u>																		
Underweight	0.75	0.19		0.80	0.21		0.80	0.21		0.94	0.35		0.98	0.39		0.97	0.39	
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight	1.32	0.20		0.95	0.20		0.95	0.21		0.49	0.40		0.39	0.44	*	0.39	0.45	*
Obese	2.43	0.27	**	1.69	0.28		1.69	0.31		0.44	0.60		0.33	0.67		0.33	0.67	
<u>Weight Perception</u>																		
Very Underweight & Slightly Underweight	1.39	0.30		1.53	0.32		1.53	0.32	*	1.69	0.33		1.26	0.30		1.29	0.31	
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	2.12	0.16	***	1.93	0.16	***	1.93	0.16	***	2.21	0.20	***	1.70	0.26	*	1.70	0.26	*
Number of Observations, Unweighted	1,906			1,906			1,906			782			782			782		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave I.

Source: The National Longitudinal Study of Adolescent Health

Table 10: Odds Ratios Predicting Suicide Ideation among White and Black Males (Weighted), Wave II

	WHITE MALES									BLACK MALES								
	Zero Order			Paired Analysis			Full Model			Zero Order			Paired Analysis			Full Model		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>																		
Very Unattractive & Unattractive	1.98	0.45								2.11	0.43	XX	XX	XX				
About Average	1.26	0.26								1.29	0.26	1.04	0.48					
Attractive & Very Attractive (Reference)	---	---	---							---	---	---	---	---				
<u>Body Mass Index Category</u>																		
Underweight	0.71	0.39		0.70	0.41		0.65	0.40		1.06	0.84		0.88	0.84		0.90	0.84	
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight	1.23	0.34		1.03	0.39		0.95	0.39		1.89	0.59		1.85	0.63		1.92	0.64	
Obese	0.96	0.42		0.70	0.50		0.61	0.48		2.21	0.82		1.82	1.08		1.90	1.01	
<u>Weight Perception</u>																		
Very Underweight & Slightly Underweight	1.07	0.30		1.18	0.31		1.19	0.31		1.66	0.47		1.90	0.49		1.94	0.51	*
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	1.50	0.23		1.60	0.30		1.63	0.31		2.35	0.51		1.67	0.70		1.65	0.71	
Number of Observations, Unweighted	1,377			1,377			1,377			492			492			492		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave II.

Source: The National Longitudinal Study of Adolescent Health

Table 11: Odds Ratios Predicting Suicide Ideation among White and Black Females (Weighted), Wave II

	WHITE FEMALES									BLACK FEMALES								
	Zero Order			Paired Analysis			Full Model			Zero Order			Paired Analysis			Full Model		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>																		
Very Unattractive & Unattractive	2.00	0.34	*				1.85	0.35		XX	XX	XX				XX	XX	XX
About Average	1.10	0.15					1.08	0.16		0.53	0.41					0.54	0.41	
Attractive & Very Attractive (Reference)	---	---	---				---	---	---	---	---	---				---	---	---
<u>Body Mass Index Category</u>																		
Underweight	1.12	0.23		1.44	0.23		1.42	0.23		0.34	0.66		0.36	0.89		0.40	0.88	
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight	1.03	0.23		0.88	0.25		0.85	0.26		1.36	0.53		1.07	0.52		1.22	0.54	
Obese	1.28	0.29		1.06	0.31		0.95	0.30		0.65	0.63		0.38	0.69		0.40	0.72	
<u>Weight Perception</u>																		
Very Underweight & Slightly Underweight	0.76	0.33		0.62	0.32		0.63	0.31		4.58	0.40	***	1.67	0.66		1.58	0.64	
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	1.24	0.16		1.33	0.19		1.30	0.20		0.87	0.37		2.61	0.44	*	2.56	0.45	*
Number of Observations, Unweighted	1,470			1,470			1,470			426			426			426		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave II.

Source: The National Longitudinal Study of Adolescent Health

Table 12: Odds Ratios Predicting Suicide Ideation among White Males and Females (Weighted), Wave III

	WHITE MALES									WHITE FEMALES								
	Zero Order			Paired Analysis			Full Model			Zero Order			Paired Analysis			Full Model		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>																		
Very Unattractive & Unattractive	1.96	0.48		1.65	0.48		1.61	0.49		0.97	0.50		0.87	0.52		0.83	0.50	
About Average	1.20	0.26		1.12	0.26		1.12	0.26		1.03	0.24		0.96	0.23		0.95	0.24	
Attractive & Very Attractive (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<u>Self-Rated Attractiveness</u>																		
Slightly Attractive & Not at all Attractive	2.30	0.34	*	2.20	0.34	*	2.19	0.35	*	1.81	0.34		1.83	0.33		1.78	0.33	
Moderately Attractive	0.75	0.33		0.74	0.33		0.72	0.34		0.93	0.33		0.92	0.33		0.92	0.33	
Very Attractive (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<u>Body Mass Index Category</u>																		
Underweight	0.91	0.78		0.96	0.80		1.15	0.78		0.84	0.67		0.71	0.71		0.70	0.71	
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight	0.48	0.31	*	0.41	0.37	*	0.41	0.38	*	0.70	0.28		0.62	0.33		0.62	0.33	
Obese	0.76	0.35		0.54	0.47		0.48	0.48		1.19	0.31		1.00	0.38		0.92	0.38	
<u>Weight Perception</u>																		
Very Underweight & Slightly Underweight	1.19	0.37		0.93	0.40		0.86	0.43		1.48	0.54		1.59	0.57		1.60	0.56	
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	1.09	0.31		1.53	0.38		1.44	0.40		1.20	0.24		1.29	0.29		1.22	0.30	
Number of Observations, Unweighted	1,258			1,258			1,258			1,436			1,436			1,436		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave IV.

Source: The National Longitudinal Study of Adolescent Health

Table 13: Odds Ratios Predicting Suicide Ideation among White Males (Weighted), Wave IV

	Zero Order			Paired Analysis			Full Model I		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>									
Very Unattractive & Unattractive	1.63	0.42		1.49	0.43		1.43	0.46	
About Average	1.26	0.23		1.16	0.23		1.22	0.23	
Attractive & Very Attractive (Reference)	---	---	---	---	---	---	---	---	---
<u>Self-Rated Attractiveness</u>									
Slightly Attractive & Not at all Attractive	3.33	0.51	*	3.25	0.51	*	3.62	0.52	**
Moderately Attractive	1.85	0.53		1.84	0.53		1.90	0.54	
Very Attractive (Reference)	---	---	---	---	---	---	---	---	---
<u>Body Mass Index Category</u>									
Underweight	2.68	0.83		2.40	0.83		2.18	0.87	
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---
Overweight	1.13	0.24		1.45	0.29		1.52	0.30	
Obese	0.85	0.30		1.31	0.39		1.26	0.40	
<u>Weight Perception</u>									
Very Underweight & Slightly Underweight	1.15	0.34		1.28	0.38		1.21	0.38	
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	0.72	0.28		0.66	0.34		0.58	0.35	
Number of Observations, Unweighted	1,432			1,432			1,432		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave IV.

Source: The National Longitudinal Study of Adolescent Health

Table 14: Odds Ratios Predicting Suicide Ideation among White and Black Females (Weighted), Wave IV

	WHITE FEMALES									BLACK FEMALES								
	Zero Order			Paired Analysis			Full Model I			Zero Order			Paired Analysis			Full Model I		
	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.	O.R.	S.E.	Sig.
<u>Interviewer-Rated Attractiveness</u>																		
Very Unattractive & Unattractive	1.08	0.40		1.09	0.40		1.08	0.40		0.58	0.66		0.54	0.68		0.51	0.74	
About Average	1.24	0.23		1.16	0.23		1.12	0.26		1.17	0.40		1.08	0.42		1.04	0.41	
Attractive & Very Attractive (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<u>Self-Rated Attractiveness</u>																		
Slightly Attractive & Not at all Attractive	1.66	0.51		1.63	0.51		1.55	0.53		4.09	0.49	**	4.09	0.50	**	4.42	0.50	**
Moderately Attractive	0.90	0.52		0.89	0.53		0.88	0.53		1.43	0.41		1.41	0.41		1.50	0.40	
Very Attractive (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<u>Body Mass Index Category</u>																		
Underweight	0.46	1.03		0.38	1.02		0.39	1.01		XX	XX	XX	XX	XX	XX	XX	XX	XX
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight	0.98	0.32		0.79	0.32		0.76	0.31		1.18	0.53		1.24	0.59		1.22	0.60	
Obese	1.27	0.26		0.99	0.29		0.87	0.31		1.23	0.52		1.46	0.73		1.44	0.72	
<u>Weight Perception</u>																		
Very Underweight & Slightly Underweight	1.60	0.52		1.91	0.52		1.85	0.52		0.22	1.08		0.26	1.08		0.22	1.10	
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	1.47	0.28		1.53	0.31		1.45	0.32		0.79	0.40		0.64	0.56		0.59	0.56	
Number of Observations, Unweighted	1,623			1,623			1,623			654			654			654		

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

All variables measured at Wave IV.

Source: The National Longitudinal Study of Adolescent Health

Table 15: Significant Findings from Models Predicting Suicide Ideation, (Weighted) Waves I-IV

	Wave 1				Wave 2				Wave 3		Wave 4		
	Males		Females		Males		Females		Males	Females	Males	Females	
	White	Black	White	Black	White	Black	White	Black	White	White	White	White	Black
<u>Interviewer-Rated Attractiveness</u>													
Very Unattractive & Unattractive						XX		XX					
About Average													
Attractive & Very Attractive (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---
<u>Self-Rated Attractiveness</u>													
Slightly Attractive & Not at all Attractive									*		*		*
Moderately Attractive													
Very Attractive (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---
<u>Body Mass Index Category</u>													
Underweight													XX
Normal Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---
Overweight				~					~				
Obese	~	*											
<u>Weight Perception</u>													
Very Underweight & Slightly Underweight	*	*	*			*							
About the Right Weight (Reference)	---	---	---	---	---	---	---	---	---	---	---	---	---
Slightly Overweight & Very Overweight	*		*	*				*					XX

Notes : Source: The National Longitudinal Study of Adolescent Health, Waves I-IV, Public Use Data.

Each column that is outlined in thick black border represents results from the final model of each race/sex category by wave.

(*) An asterick that intersects a race/sex category under a specific wave of data and variable category I (i.e. "white males, Wave 1, Very Underweight & Slightly Underweight Weight Perception) indicates a statistically significant odds ratio estimate that is higher than 1 (there is a significant increase in the odds of suicide ideation).

(~) A tilde that intersects a race/sex category under a specific wave of data and variable category (i.e. "white males, Wave 1, obese BMI") indicates a statistically significant odds ratio estimate that is less than 1 (there is a significant decrease in the odds of suicide ideation).

(XX) Two X's that intersect a race/sex category under a specific wave of data and variable category (i.e. "black males, Wave 2, Very Unattractive & Unattractive") indicates that less than 5% of the respondents in that category ideated about suicide in the past year, and odds ratio estimates are not certain (less than 5% of black male respondents who were categorized as either "Very Unattractive" or "Unattractive" ideated about suicide in the previous year).

RESULTS

Interviewer-Rated Attractiveness

Presented in Tables 8-14 are odds ratios indicating the likelihood of suicide ideation for Waves I-IV respondents with respect to how their physical attractiveness was rated by an interviewer in each wave. In Wave II, Model 1, for white females who were rated by interviewers as "very unattractive" or "unattractive," compared to white females of Wave II that were rated "attractive" or "very attractive," the odds of ideating about suicide is 100% higher. However, once other variables (body mass index and weight perception) are taken into account, the odds ratio estimate is no longer statistically significant. However, interviewer ratings of "very unattractive" or "unattractive" did not produce statistically significant results in any other model of any other wave for white females. Interviewer ratings of neither "about average" or the combination of "very unattractive" and "unattractive" did not significantly increase the risk of ideating about suicide for white males, black males, or black females in any other model of any wave of data.

Self-Rated Attractiveness

Presented in Tables 8-14 are odds ratios indicating the likelihood of suicide ideation for Waves I-IV respondents with respect how they rated their own physical attractiveness. In Wave III, compared to white males who rated themselves as "very attractive," white males who rated themselves as "slightly attractive" or "not at all attractive" are 1.19 times more likely to ideate about suicide. In Wave IV, compared to white males who rated themselves as "very attractive," white males who rated themselves as "slightly attractive" or "not at all attractive" are 2.62 times more likely to ideate about suicide. Also in Wave IV, compared to black females who rated themselves as "very

attractive," black females who rated themselves as "slightly attractive" or "not at all attractive" are 3.71 times more likely to ideate about suicide.

Actual Body Weight

Presented in Tables 8-14 are odds ratios indicating the likelihood of suicide ideation for Waves I-IV respondents with respect to which body mass index category they belong. In consideration of actual body mass in terms of body mass index class categories, overweight white adolescent males in Wave I are 50% less likely to ideate about suicide when compared to Wave I white adolescent males of a normal weight. In contrast, obese black adolescent males in Wave I are 3.3 times more likely to ideate about suicide when compared to their same race, same sex adolescent counterparts who are of a normal weight in Wave I. For black adolescent females in Wave I who are obese, the chances of ideating about suicide are significantly decreased by 61% compared to their same race, same race adolescent counterparts who are of a normal weight in Wave I. Wave III overweight white young adult males are 69% less likely to ideate about suicide when compared to Wave III white young adult males of a normal weight.

Weight Perception

Presented in Tables 8-14 are odds ratios indicating the likelihood of suicide ideation for Waves I-IV respondents with respect to how those respondents perceived their body weights. In contrast with Wave I white adolescent males who report that they are "about the right weight," Wave I white adolescent males who perceive themselves as "slightly underweight" or "very underweight" are 57% more likely to ideate about suicide, and Wave I white adolescent males who report their weight as "slightly overweight" or "very overweight" are 1.58 times more likely to ideate about suicide in

Wave I. Perceiving oneself as underweight is a significant factor for suicide ideation for Wave I black adolescent males as well. In contrast with Wave I black adolescent males who report that they are "about the right weight," black adolescent males who perceive themselves as "slightly underweight" or "very underweight" are 2 times more likely to ideate about suicide in Wave I. In Wave II black male adolescent respondents who perceive themselves as "slightly underweight" or "very underweight" are 94% more likely to ideate about suicide (in contrast with black adolescent males who report that they are "about the right weight" in Wave II).

Perceiving oneself as overweight appears to be the significant factor for suicide ideation for adolescent females in Wave I. In contrast with Wave I white adolescent females who report that they are "about the right weight," Wave I white adolescent females who perceive themselves as "slightly overweight" or "very overweight" are 93% more likely to ideate about suicide, and Wave I white adolescent females who report their weight as "slightly underweight" or "very underweight" are 53% more likely to ideate about suicide. As well, Wave I black adolescent females who report that they are "slightly overweight" or "very overweight" are 70% more likely to ideate about suicide when compared to their same race, same sex counterparts. In Wave II, overweight weight perception (either reporting oneself to be "slightly overweight" or "very overweight") was only a statistically significant predictor of suicide ideation for black female adolescents, who were 1.56 times more likely to ideate about suicide, compared to their same race, same sex Wave II counterparts who reported themselves to be "about the right weight."

DISCUSSION

Neither actual body weight nor interviewer-rated attractiveness significantly increased the odds of suicide ideation in any final model. Adolescent males and females of black and white racial backgrounds are at greater risk of suicide ideation if they perceive that they are of a non-normal weight. Having an underweight perception of weight significantly increases the chances of ideating about suicide for male adolescents, and having an overweight perception of weight significantly increases the chances of ideating about suicide for female adolescents.

Interestingly, adolescent white males and females are both at higher odds of ideating about suicide if they perceive that they are either overweight or underweight, but this finding is not true for adolescent black males and females. In fact, in Wave II, the only significant predictor of suicide ideation in the final model for black males is perception of underweight, and the only significant predictor of suicide ideation in the final model for black females in Wave II is perception of overweight.

Perceiving oneself as underweight or overweight for adolescent white males significantly increases the odds that a white male will ideate about suicide in adolescence, but the same is not true for white males in early adulthood. Black adolescent males who perceive they are underweight are at increased risk for ideating about suicide, but black males in early adulthood are not. White and black adolescent females who perceive they are overweight are at increased risk for ideating about suicide, but black and white adult females are not. Further, rating oneself as "very unattractive" or "unattractive," in comparison to rating oneself as "attractive" or "very attractive" produces significantly

higher chances of ideating about suicide for adults of both sexes in adulthood, but weight perception is more a more important factor for adolescents and differs between sexes.

Implications

The implications of this study are as follows. First, this study highlights the importance of the personal perception of the self in society in two realms of appearance-based attractiveness in comparison with structurally formed notions of attractiveness: general physical attractiveness, and weight-based attractiveness. Second, this study points out that there are distinct gender and racial differences among adolescent and adult white and black males and females. Third, and most importantly, this research provides greater understanding for the risk factors of suicide in these populations.

Limitations

There are two considerable limitations that influence the results from this study. First, this study is limited by analyzing the public-use sample of the Add Health data, rather than the complete private-use data. Second, the issue of self-report is critical to explore as a limitation of Add Health survey data. Possible strategies for addressing these limitations are discussed in the section below titled “*Future Directions for Research.*”

Using data from the Add Health public-use sample

Sample sizes of categories like race and ethnicity are limited in data from the Add Health public-use sample. The sample size of the Add Health public-use data may be large enough for analyzing common characteristic behaviors of adolescents, but because the majority of adolescents do not report ideating about suicide, analyzing the differences between racial lines is limited. As discussed, analyzing differences among black, white, male and female respondents is crucial for this study. There is a significant difference in

frequency of suicide ideation between males and females, as well as white non-Hispanics and black non-Hispanics. As well, the importance of specific aspects of physical attractiveness, such as achieving the “thin ideal,” is not comparable for white and black females.

Another reason private-use data would be more appropriate is that information about the race of the interviewer who rated respondents’ physical attractiveness is absent from the public-use sample of Add Health. This information is available in the private-use Add Health data, however, and it is the belief of the author that controlling for the race of the interviewer may provide more valid results for attractiveness as judged by an “other.” This is, of course, only true to the extent to which each interviewer has internalized the ideals of physical attractiveness of his or her cultural identity. This is not measurable with available data, however, so this future direction would be subject to its own limitations based on the assumption that an interviewer more likely would judge a respondent of the same racial or ethnic category as attractive. Even with this limitation, a closer look at how interviewers rate attractiveness is warranted.

Further, causation and temporal order regarding aspects of physical attractiveness, emotional distress, and suicide ideation cannot be established using the cross-sectional design employed in this study. If the private-use data were employed, the possibility exists of taking advantage of Add Health’s longitudinal design to control for factors such as previous suicidal behaviors. However, limiting the sample size any further than what is achieved here would not be a wise choice.

Using Add Health self-report measures

Add Health is one of the most widely used nationally representative longitudinal datasets; it is rich with personal information about adolescents' personal views and health-related behaviors. However, the issue of self-report must be considered. In this study, significantly important limitations that exist regarding self-report deal with the accuracy of retrospective accounts of suicide ideation within the previous twelve months, the accuracy of perception of body weight, and the accuracy of reporting one's actual weight and height in Wave I data.

The issue of self-reporting of body weight must be considered as well, particularly when studies have shown that self-reported weights may not be accurate. Wave I allowed for self-reporting of height and weight, without the use of scales or height measuring tools. At Wave II, interviewers began measuring height and weight, and this ensures better validity of body mass index scores for respondents of Waves II-IV. Previous research has noted examples of discrepancies between actual and perceived weight. For example, in Waves I and II of Add Health, females were found to be more likely to overestimate their weights when compared to males; however, this was not found to be true for black females (Martin, Frisco, and May 2009). This research suggests that a number of these adolescents do not correctly estimate their weight or perceive whether they are out of a normal range for weight for their age, height and biological sex. This is another important consideration when discussing the limitations of self-report measures employed in this study.

CONCLUSIONS

The research goals of this study were three fold. The first purpose of this study aimed to determine whether lacking physical attractiveness significantly influenced the risk of suicide ideation. The second purpose of this study was to determine whether there would be differences in what measures of physical attractiveness (if any) increased the odds of suicide ideation in adolescents and whether those types of predictors of suicide ideation would differ for adults. Finally, the third purpose of this study was to specifically test whether racial backgrounds between white and black adolescents and adults would produce different results.

This study finds out that perception of self is crucial in determining whether having an appearance that does not meet the stringent standard of “ideal” forms of physical attractiveness may lead to suicide ideation. This suggests that it is the internalization of stigmatization of non-normal weight or unattractive physical appearance is the most important consideration in mental health behaviors and outcomes related to suicide. After all, if weight-based stigma did not exist, there may not even be a relationship between the factors.

Future Directions for Research

To address current limitations and more effectively answer the research questions in this study, future research is needed. Of particular importance for achieving these two goals will be to employ the private-use Add Health data. For future research, using the full, private-use data of Add Health would be extremely beneficial because it would increase the statistical power of the analysis, especially for racial sub-populations. For reasons dealing with limitations such as small sample sizes in sub-categories (such as

interviewer-rated attractiveness and suicide ideation in black males and females) as well as limited access to variables associated with survey questions that would be more appropriate, obtaining and using private-use Add Health data are critical.

Normalizing scores of interviewer-rated attractiveness

As well, this research would benefit if responses for interviewer-rated attractiveness were able to be normalized to fit a normal distribution. The levels of measurement in the proposed research model are an important consideration in the methodological design. The original measure of interviewer-rated attractiveness is vulnerable to criticism based on not only personal biases of interviewers, but also is subject to bias based on the nature of the variable. The very coding of the variable is an issue at least. For example, the response “unattractive” is not twice as unattractive as “very unattractive,” but is coded as 2, where “unattractive” is coded as 1. This presents limitations for statistical analysis, but the current research does propose the use of raw data score of interviewer-rated attractiveness as a means of comparison with two alternative measures of the interviewer-rated attractiveness variable: one where the ordinal measure of attractiveness is normalized, and one where consistent ratings of attractiveness throughout each wave of data.

Attractiveness is a social construct that exists largely in hegemonic ideals of what represents beauty in a culture. It is a rather subjective measure of such beauty, and one is best described as attractive in relation to another, and because there are many interviewers who fail to employ the entire scale when interviewing a large number of respondents, there is a need to separate, standardize, and *then* compare results.

The interviewer-ranked attractiveness measure presents issues for statistical analysis due to individual biases of the interviewers, as well as non-normative distribution of rankings throughout the Add Health sample. To address interviewer bias and underuse of the full scale of *attractiveness* throughout respondents who were ranked, the values for this variable would be standardized individually for each interviewer based on the number of ranks employed in relation to his or her mean ranking. This provides a better method to analyze the mean scores of interviewer-ranked attractiveness based on Freeman's (1965) method for evaluating associations between a nominal variable and an ordinal variable. This technique involves using interviewers' mean scores of attractiveness to create z-scores for each respondent. After standardizing the scores using this method, individual scores will be scaled so that the distribution has a mean of 0 and a standard deviation of 1.

Consider this example: interviewers who only employed the rankings of "very attractive," "attractive," and "about average" would be associated with a pool of respondents whose average score of attractiveness could possibly be higher than respondents whose interviewers only assigned rankings of "about average" and "unattractive." This presents issues when the goal of the analysis is to compare the attractiveness of individuals to determine individual likelihood of suicidal behavior. This would allow for a more comparable, and thus, more reliable measure of interviewer-ranked attractiveness.

Comparing "consistent" ratings of interview-rated attractiveness

The research also proposes as a future direction the use of the scaling technique mentioned as well as a comparison of individuals who were consistently rated at each

extreme of the attractiveness spectrum. This method would allow for an even more reliable measure of attractiveness because it uses ratings from four different interviewers who each rated respondents over the course of all four waves of data as “very attractive” and “very unattractive.” Certainly an individual who is consistently rated as “very attractive” is, *at very least*, socially attractive, and a person who is consistently rated as “very unattractive” is likely to have failed to meet social standards of attractiveness in his or her lifetime.

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