Abstract

Title of Document: GENDER SOCIALIZATION AND FAMILY INFLUENCES ON BODY IMAGE AND WEIGHT LOSS BEHAVIOR AMONG ADOLESCENT GIRLS: FINDINGS FROM THE NATIONAL LONGITUDINAL STUDY OF ADOLESCENT HEALTH

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The rise in preoccupation with weight and dieting among adolescent girls in the last 30 years has produced a plethora of clinical research on body image and other correlates of disordered eating. However, there have been few longitudinal population studies investigating precursors and prevalence of actual cognitive distortion in body image among girls or its health consequences. Data on U.S. girls (ages 12-21) were drawn from the National Longitudinal Study of Adolescent Health (Add Health). Using Symbolic Interaction and Feminist Sociocultural theories, logistic regressions were conducted to test theoretical propositions and investigate possible pathways of risk from gendered self-concept to body image distortion (BID), and from BID to risky weight loss behavior (e.g., diet pills, vomiting, and laxatives) and more common weight loss

behaviors such as dieting and exercising to lose weight. Family social support, parent traditional attitudes, and background variables (race/ethnicity, age, parent education, and BMI status) were also considered. Multivariate analyses at Time 1 suggest that self-esteem is negatively associated with BID and high appearance investment is positively associated with BID. Multivariate longitudinal analyses suggest that BID at Time 1 predicts the onset of both risky weight loss behaviors and dieting by Time 2 (one year later), controlling for weight loss behavior at Time 1. High self-esteem is also associated with decreased risk of engaging in risky weight loss behaviors and decreased dieting behavior. Self-esteem has a direct effect on BID and an indirect effect on unhealthy weight loss behaviors, mediated through BID. There is no evidence that BID mediates the relationship between self-esteem and dieting to lose weight, however. Parent traditional attitudes are associated with girls' higher social passivity, but are unrelated to self-esteem and appearance investment. Results suggest that universal, developmentally appropriate prevention programs addressing body image, realistic body weight self-assessment, and self-esteem are needed, as well as targeted programs for girls at risk for BID or who already display BID, in order to curb risky and unnecessary weight loss practices. Suggestions for designing screening and prevention programs based on theory and current research are discussed.

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Chapter 1: Introduction

The rise in preoccupation with weight and dieting in the last 30 years has produced a plethora of clinical research on body image and other correlates of disordered eating, a booming industry in weight loss products and services, and a seemingly insatiable appetite for the thin feminine ideal. Indeed, despite impressive gains among women in industrialized nations over the last century in the areas of educational advancement, economic independence, legal rights, and greater equity in the home and workplace, a puzzling source of psychological oppression and insecurity lingers among women and girls: widespread body image dissatisfaction (Wolf, 1991). Some have speculated that manufactured body image dissatisfaction is one of the last bastions of sexism in our society, with surprising power to keep women distracted with personal insecurities (Wolf, 1991). Even elderly women are not immune. In a non-clinical sample of 1,000 women between the ages of 60 and 70, over 60% reported body dissatisfaction and 80% reported using weight control methods such as dieting (Mangweth-Matzek et al., 2006).

Among girls, consider the fact that the number one wish among girls ages 11-17, who would arguably have opportunities to learn, do or achieve anything they desired, is to lose weight (Kilbourne, 1994); and that 46% of girls ages 9-11 report that they are sometimes or very often on a diet (Gustafson-Larson & Terry, 1992). In a representative sample of adolescents in grades 7-12 in Minnesota, only 21% of girls report having a positive body image compared to 53% of boys; and over half of heterosexual girls perceive themselves to be overweight compared to 17% among boys (French, Story, Remafedi, Resnick & Blum, 1996). It is well-established that females are at far greater

risk for body image problems than males (American Psychiatric Association, 2000), but why?

Female bodies, particularly among adolescent girls, have become a source of distress and self-criticism, an objectified "project" for anxious self-improvement (Brumberg, 1997; Fredrickson & Roberts, 1997); rather than a natural and pleasurable source of vitality, agency, and mastery. This is a pressing social and public health problem, given the array of negative health factors associated with body image disturbance, such as disordered eating (Polivy & Herman, 2002; Webster & Tiggemann, 2003), depression and anxiety (Cash, Theriault & Annis, 2004; Stice & Bearman, 2001), and high risk behaviors among girls (Wild, Flisher, Bhana & Lombard, 2004).

Despite a plethora of research on body image, body image problems persist; and an alarming trend is that body image dissatisfaction is increasingly found among diverse cultures and groups of women (Al-Sendi, Shetty & Musaiger, 2004; Bay-Cheng, Zucker, Steward & Pomerleau, 2002; Beato-Fernandez, Rodriguez-Cano, Belmonte-Llario & Martinez-Delgado, 2004; Crago, Shisslak & Estes, 1996). Greater understanding of the etiological mechanisms and pathways between sex, gender, body image, and adverse health outcomes is sorely needed to promote adolescent health (Striegel-Moore et al., 2004) and ameliorate if not prevent young women's susceptibility to enlisting in a lifetime of "body wars" (Maine, 2000).

Purpose

The purpose of this study is to investigate hypothesized pathways of risk/resilience for body image distortion and risky weight loss behaviors among U.S. adolescent girls. Building on the current literature and drawing upon feminist

sociocultural and Symbolic Interaction theories, research questions examine the influence of parental gender attitudes on girls' gendered self-concept, the influence of self-concept on body image distortion, and the influence of body image distortion on risky weight loss behaviors. Family social support as a buffer of risk for unhealthy weight loss is also investigated.

In broad terms, the study explores the role of gender socialization, via self-concept and family transmission, on adolescents' mental health (i.e., body image distortion) and physical health (i.e., weight loss behaviors); and with family social support as a possible protective factor. The remainder of this chapter introduces several major issues and concepts within the literature that frame this study, and concludes with the objectives and expected contributions this study makes to the literature, theory, and practice.

Body Image Disturbance: Dissatisfaction and Distortion

Three common, and sometimes confusing, terms related to body image found in the literature are body image dissatisfaction, disturbance, and distortion. In this paper, body image disturbance is used as an umbrella term for both dissatisfaction and distortion, while the more precise terms are used when referring to a particular construct or study in order to accurately portray findings. In the literature, body image *dissatisfaction* is usually assessed as a continuous measure by one of many available standardized scales or by a single Likert scale item indicating satisfaction with one's weight and shape. Body image *disturbance* is a broader term that usually encompasses dissatisfaction as well as other dimensions of poor body image such as degree of internalization of the thin-ideal, weight preoccupation, and negative appraisal of one's

body shape or weight. Body image *distortion* is a specific term that indicates an assessment of one's body that is distorted in some way, usually a mistaken assessment of one's perceived weight. All three (body image distortion, dissatisfaction, and disturbance) are correlated with disordered eating and risky weight loss methods (Barker & Galambos, 2003; Phares, Steinberg & Thompson, 2004; Polivy & Herman, 2002; Webster & Tiggemann, 2003). An additional term that is often confused with the above three body image terms is body *dysmorphia.* Body Dysmorphic Disorder, however, refers to an obsessive preoccupation with an imagined or exaggerated defect in a particular body part or attribute (e.g., large ears, crooked nose) that causes intense distress or impairment, and that is not accounted for by another mental disorder such as Anorexia Nervosa (American Psychiatric Association, 1994).

One of the issues in the literature is that body image terms are often used with little consistency between researchers or articles. Greater precision in terminology and greater consensus among researchers about which aspects of body image are most salient for public health research and program development are needed. Most body image studies measure body image dissatisfaction; but because it is so common, it is not a sensitive indicator of body image disturbance. Body image distortion (BID), on the other hand, is a more conservative measure of body image disturbance, and is used throughout this study, as recently recommended in the literature (Mangweth-Matzek et al., 2006; Mangweth et al., 2004).

Relevance of Body Image to Health and Mental Health Outcomes

Does it matter if women are dissatisfied with their bodies? While some researchers have deemed body image dissatisfaction so pervasive that it should be

considered a matter of "normative discontent" among females in modern society (Tiggemann & Wilson-Barrett, 1998), given its adverse consequences, and the culturally influenced gender disparity in its occurrence, it is anything but normative. A recent study based on the 2001 Youth Risk Behavior Survey found that body image distortion, i.e., the perception of one's weight as above or below normal while controlling for actual weight, increased the odds of suicidal behaviors (Eaton, Lowry, Brener, Galuska & Crosby, 2005). Body image dissatisfaction is associated with greater susceptibility to internalization of thinness ideals (Barker & Galambos, 2003), and even cardiovascular disease (McComb, Cherry & Romell, 2003). Though it may begin in adolescence, body image disturbance affects women of all ages across the lifespan (Green & Pritchard, 2003; Kjaerbye-Thygesen, Munk, Ottesen & Kjaer, 2004; McLaren & Kuh, 2004; Webster & Tiggemann, 2003). Indeed, it leaves a dubious legacy: one study based on a survey of over 11,000 women concluded that when body dissatisfaction or simply the perception of overweight is established during childhood and adolescence, it tends to remain unchanged regardless of later body shape and weight (Kjaerbye-Thygesen et al., 2004).

Shared Risk Factors for the Spectrum of Weight-related Disorders

Researchers are beginning to examine the shared risk factors for obesity and eating disorders, including dieting, body image dissatisfaction, and weight-based teasing (Haines & Neumark-Sztainer, 2006). Body dissatisfaction is correlated with decreased effectiveness of weight loss efforts (Field et al., 2003); and current studies on obesity in children and adolescents are beginning to find that dieting and food restriction are themselves risk factors for weight gain and disordered eating, especially among children

(Ackard, Neumark-Sztainer, Story & Perry, 2003; Field et al., 2003). These studies provide the rationale for including dieting to lose weight as one of the outcome variables of this study, in addition to risky weight loss behaviors more commonly associated with disordered eating.

Connections between gender socialization, weight loss behavior, body image disorders, eating disorders, and obesity have important implications for how prevention programs are designed and implemented. Scholars have identified the need for an integrated approach to preventing a spectrum of weight-related problems (Haines & Neumark-Sztainer, 2006), so that interventions do not unwittingly exacerbate body image disturbance and disordered eating while responding to the current public health campaign to reduce obesity (Irving & Neumark-Sztainer, 2002; Neumark-Sztainer, 2003). Clearly, the emergence of body image as an important construct and focus in social science, public health, and developmental research is warranted.

Gender Socialization, Families, and Femininity

How might simply being born a girl increase an adolescent's risk for body image problems and disordered eating? Studies have shown that parental attitudes, expectations, and child-rearing values and practices differ by gender in stereotypical ways that may, for example, reinforce autonomy in boys and dependency in girls (Leaper, Anderson & Sanders, 1998; Whiting & Edwards, 1988). As a consequence, traditional gender socialization within the family may be a factor that encourages girls to adopt feminine sex-roles. Family members' adoption of feminine beauty ideals may also have socializing influences on a daughter; for example body dissatisfaction is more likely to occur in families in which there is pressure to be thin (Young, Clopton & Bleckley, 2004), a

history of eating concerns, or weight-related teasing (Phares et al., 2004). As noted by feminist scholars, there is need for further research that explores gender socialization within family contexts (Sollie & Leslie, 1994). Few studies have examined how families, as gatekeepers of culture to young children, and parental attitudes related to gender affect their daughters' risk for body image distortion and weight loss behavior.

Gender identity, the degree to which a person of either sex endorses stereotypical "feminine" (i.e., expressive) and/or "masculine" (i.e., instrumental) characteristics, has implications for mental health. A meta-analytic review of sex-role adherence and disordered eating found that "femininity" had a positive association with disordered eating behaviors and "masculinity" had a negative association (Murnen & Smolak, 1997).

In addition, higher levels of femininity endorsement is associated with higher rates of depression among both girls and boys (Hart & Thompson, 1996; Wichstrom, 1999); and studies show that adolescent girls who score high on both "feminine" and "masculine" personality characteristics (i.e., androgyny), such as nurturance and competition, have higher self-esteem, more adaptable social skills, and show more mature judgment than girls who identify with predominately "feminine" characteristics (Bem, 1981; Taylor & Hall, 1982; Boldizar, 1991). Scholars have suggested that a rigid "feminine" gender identity may lead to learned helplessness, loss of power in intimate relationships, and devaluation of one's emotional needs and life goals (Berk, 2003). There is some evidence to suggest, however, that it may not be femininity per se, but the absence of instrumental (stereotypically masculine) traits that confers risk (Lamke, 1982).

While many researchers and theorists acknowledge the pervasive influence of gender stereotypes, feminine body ideals, and media images on body image (Dunkley,

Wertheim & Paxton, 2001; Hawkins, Richards, Granley & Stein, 2004; Milkie, 1999; Paquette & Raine, 2004; Polivy & Herman, 2004; Webster & Tiggemann, 2003), these sociocultural influences are difficult to quantify. There is need for further research that operationalizes gendered parental attitudes and gendered self-concept in ways that can be tested empirically as potential pathways of risk for and resilience against body image distortion and risky weight control practices.

The salience of gender socialization and gender identity to adolescent social and emotional health, especially to body image and weight-control practices, raises important questions. Although all girls in the U.S. are exposed to similar cultural factors, why are some girls more restricted in gender stereotyped ways than others? Does a "feminine" self-concept confer greater risk to girls for distorted body image and various types of weight control behaviors? Does self-concept operate directly on weight loss behaviors or is it mediated through body image distortion? What role does the family play in facilitating or moderating risk for unhealthy weight loss?

Objectives

Data for this study will be drawn from the public use version of the National Longitudinal Study of Adolescent Health, Waves I and II (Add Health). This study has four main objectives: 1) to examine the effect of gendered self-concept on body image distortion and on weight loss behaviors; 2) to test whether the hypothesized relationships between aspects of gendered self-concept and risky weight control practices is mediated by body image distortion; 3) to assess whether family social support predicts risky weight loss behavior and/or moderates the strength of the association between body distortion and weight control practices; and finally 4) to examine whether parent traditional

attitudes are associated with aspects of a girl's gendered self-concept. To summarize, the proposed study will examine family and individual level risks and protective factors in the development of body image distortion and risky weight loss behavior strategies among adolescent girls using nationally representative data.

Contributions to the Literature

This study is expected to make contributions to the literature in following ways:

- Use of longitudinal population data to predict weight loss behaviors from BID and family social support, in which Time 1 is included as a control. This design yields a test of change (i.e., onset) of weight loss behaviors between Time 1 and Time 2. This improves upon the more common cross-sectional questionnaires typically found in the body image literature.
- First known study to test body image distortion as a mediator of risk between self-esteem and weight loss behaviors in a longitudinal design.
- First known study to formally test family social support as a moderator of risk between BID and unhealthy weight loss in a longitudinal design controlling for Time 1. Contrary to expectations, this study suggests that family social support is not able to buffer risk once BID has been established. This finding raises important new questions about the sequence and timing of risk and protective factors for disordered eating.
- Application of feminist and Symbolic Interaction theories to research using large survey data.
- Construction and use of the variable BID (rather than the more commonly used body image dissatisfaction variable) in a hypothesized causal model, as

recommended in the literature. BID is considered a more conservative and perhaps sensitive measure of body image disturbance.

- Updates the literature with a study on the impact of gender role adherence on body image distortion and weight loss behaviors. Despite measurement limitations and mostly non-significant findings related to gender, this is one of the first studies to attempt testing "the femininity hypothesis" of disordered eating with population level data.
- Population level longitudinal data offers a useful complement to the many clinical and convenience samples studied in body image research; and to the cross-sectional designs that are limited to correlational analyses.
- Elucidation of the role of BID as a risk factor for disordered eating/dieting yields findings that can easily be translated to screening and prevention programs.. Further intervention research needs to be conducted to determine how amenable to change BID is once it has been established.

Chapter 2: Literature Review

This chapter presents a theoretical framework for this study and a review of literature on the relationships among gender socialization, self-concept, body image, weight loss behavior, and family social support. First theories are discussed. Main dependent/outcome variables are reviewed, as well as relationships among key variables, and control variables. The chapter concludes with an analytic model of the research questions that were generated by theory and the literature review, and a summary of hypotheses under investigation.

Theory

The literature on body image and disordered eating has flourished but has been criticized as lacking strong theoretical moorings (Polivy & Herman, 2002). While there is ample evidence of the use of micro theories such as social comparison (Morrison, Kalin & Morrison, 2004; Lin & Kulik, 2002; Murris, Meesters, van de Blom & Mayer, 2005), utilizing a major, unifying theory remains challenging; perhaps because of the need to account for findings about influences on body image and disordered eating on multiple levels, e.g., sociocultural, family, peer and individual and the literature is informed by research from so many different disciplines. To best accommodate these different levels of potential influence, this study employs Symbolic Interaction theory sensitized by Feminist Sociocultural perspectives. Together, these two perspectives offer testable explanations at multiple levels: sociocultural, family, and individual.

Feminist, Sociocultural, and Symbolic Interaction Theories seemed most relevant to the knowledge gaps and questions suggested by the literature review, especially given

the population of interest (adolescent girls), the line of inquiry (gender socialization), and the context of interest (family).

Feminist sociocultural perspectives and Symbolic Interaction theory are utilized to theoretically guide this inquiry and generate hypotheses about the relationships among constructs. These frameworks are described below and applied to an understanding of body image and risky weight loss behaviors among adolescent girls.

Feminist Sociocultural Analysis

Both feminist and sociocultural perspectives point to the role that pervasive cultural norms and gendered expectations play in the development of body image and eating disorder problems (Polivy & Herman, 2004; Fingeret & Gleaves, 2004; Gilbert & Thompson, 1996; Twamley & Davis, 1999), particularly in the lives of girls and young women as they engage in the construction and reproduction of femininity, in identity development, and as they experience physical/sexual maturation (Brumberg, 1997; Thorne & Luria, 1999). Curiously, I found that studies examining the role of gender and sociocultural norms referred to either Feminist or Sociocultural Theory, but rarely both, though there are exceptions (Fingeret & Gleaves, 2004). Perhaps the sociocultural perspective is more descriptive and so more amenable to operationalization and hypothesis testing; while the feminist perspective tends to be more conceptual, and some would say, ideological. Both are important. I see these perspectives as closely related but making distinctive contributions to the framework of this study.

Sociocultural theory, as described in the literature on body image, is used frequently to refer to and explain cultural and individual level manifestations of a de-politicized but implicitly sexist society: norms and pressures such as the female thin

ideal, objectification of the female body in advertising and mass media, gender stereotypes, gendered role expectations, and body dissatisfaction among females (Morrison et al., 2004; Polivy & Herman, 2004; Paquette & Raine, 2004). Feminist Theory, on the other hand, names and addresses sexism directly. Feminist theory illuminates the political and social-structural implications of gender, and its intersections with race and class, resulting in phenomena such as power imbalances, deferential "gender displays," internalized sexism, consumer identities, and social inequalities (Connell, 1987; West & Zimmerman, 1991; Oswald, Blume & Marks, 2005). A feminist approach to conducting research also carries with it an ethical responsibility to be self-reflexive, to guard against essentializing differences based on constructed social categories of gender or race/ethnicity, and to engage questions that have potential to make a positive difference in people's lives (De Reus, Few & Blume, 2005; Baber, 2005). Taken together, these two perspectives effectively describe a culture in which the adolescent female body is scrutinized and objectified, and explain the patriarchal and capitalist forces that sustain such inhospitable conditions for girls. Under conditions of patriarchy and unbridled capitalism, and without skills of resistance and resilience, the feminine is trivialized as decorative and the female body disparaged as perpetually inadequate (Frost, 2001; Frank, 1999; Katz, 1999).

Empirical studies examining sociocultural influences on body image have attended to gender (Fingeret & Gleaves, 2004; Markey, 2004; Polivy & Herman, 2002; Griffiths et al., 1999), race/ethnicity (Hill, 2002; Wildes & Emery, 2001; James, Phelps & Bross, 2001; Milkie, 1999), socioeconomic status (Walcott, Pratt & Patel, 2003), and historical context (Brumberg & Striegel-Moore, 1993). The compelling historical

perspectives leave little doubt about the influence of culture, gender, and historical context on adolescent and adult symptom formation and body shape ideals (Brumberg & Striegel-Moore, 1993). While historically, anorexia nervosa, a restrictive type of eating disorder, has been most commonly diagnosed among White women of high socioeconomic status (SES) (Brumberg & Striegel-Moore, 1993), contemporary studies show that symptoms of eating disorders and body image disturbances are not limited to young rich white girls (Markey, 2004), who may simply be more likely to seek treatment and be counted. In fact, studies show that body image disturbances and symptoms of disordered eating are found throughout the lifespan (Webster & Tiggemann, 2003), among both males and females (Green & Pritchard, 2003), and among a broad range of race/ethnic and socioeconomic groups (Al-Sendi et al., 2004; Beato-Fernandez et al., 2004; Edman & Yates, 2004; James et al., 2001; Story et al., 1997; Rome et al., 2003). However, gender and race/ethnicity appear to influence risk for body image disturbance and for specific types of eating disorders.

For example, girls are far more likely than boys to be dissatisfied with their bodies (Presnell, Bearman & Stice, 2004), to overestimate their weight (Strauss, 1999), to internalize the thin ideal (Jones, 2004), to compare themselves with media standards of attractiveness (Morrison et al., 2004), and to develop clinical eating disorders (National Institute of Mental Health [NIMH], 2001). These data alert us to underlying structural issues related to gender and power in our society; yet we often forget to ask the basic social-structural question of why females are so much more likely to dislike/hate their bodies and attempt weight loss behavior than males; even though research shows that on average, boys are actually more likely to be overweight than girls (Hofferth & Curtin,

2005). Researchers have often employed a feminist and/or sociocultural perspective to postulate how aspects of gender socialization place girls at greater risk than boys for body image and eating disorder problems (Polivy & Herman, 2004). To the extent that body image distortion and weight loss behavior are a result of sociocultural influences, consistent with a feminist framework, we would expect that a healthy resistance to gender stereotyped attitudes, images, and behaviors among adolescents and/or their parents would reduce the odds of body image distortion and weight loss behavior; and displays of gender stereotype conformity would increase the odds of body image distortion and weight loss behavior (Frank, 1999; Twamley & Davis, 1999).

Although a feminist sociocultural framework is essential to identifying the structural issues and embedded sexist and gendered cultural artifacts that permeate our society (e.g., media images, the thin ideal, gender stereotypes, external beauty fixation), it alone does not provide a theoretical basis for explaining the variation in how young women internalize, interpret, and create personal meaning from these gendered artifacts in ways that may lead to body image distortion or weight loss behavior. For such an enhanced theoretical grounding, this study utilizes a Symbolic Interaction framework.

Symbolic Interaction Framework

Propositions within the Symbolic Interaction framework offer possible explanations for the connections between feminist and/or sociocultural observations and adolescent girls' risk for body image distortion and weight loss behavior, and will tested in this study. Major premises of Symbolic Interactionism include the following: individually and collectively, human beings construct meanings from experiences to help them make sense of their world; the meanings human beings create are contingent on the

context and situation in which they have experiences; human beings' thinking and meaning-making shapes their behavior; and individuals are born into pre-existing social worlds with which they must interact behaviorally, interpersonally, and mentally (symbolically) (White & Klein, 2002; Stryker & Vryan, 2003; Blumer, 1969). These premises highlight the importance of family and relational context, perception, and subjective interpretation of experience in the development of body image distortion and weight loss behavior practices among adolescents. As previous research on body image using a Symbolic Interaction framework has shown, relationship structures and social support highly influence the meaning one ascribes to an illness; and in turn, meaning predicts body image, personal control, and psychosocial functioning (Fife, 1995).

This study evaluates several theoretical propositions within the Symbolic Interaction (SI) framework, including those propositions defined under the concepts of role enactment, definition of the situation, and interpersonal competence (Burr, Leigh, Day & Constantine, 1979). Role enactment refers to the behaviors that fulfill role expectations/demands, and provides the theoretical explanation for "gender displays," or behaviors that align with stereotypical feminine expectations among adolescent girls. The concept of definition of the situation is that when a person defines a situation as real, it is real in its consequences. Based on this concept, we would expect to find that girls who believe they are fat, regardless of actual weight (i.e., BMI), will engage in weight control and weight loss behaviors. The concept of interpersonal competence, within the SI framework, is that the greater the repertoire of role skills and the more complex the conceptions of the self, the greater the interpersonal competence. Based on this proposition we would expect that girls who have a high sense of physical vitality, high

self-esteem, and low levels of gender conformity would have more interpersonal competence and therefore be less susceptible to body image distortion and weight loss behavior.

Current State of Knowledge

Body Image

Body image is defined in several different ways in the literature. The construct of body image may refer to the level of satisfaction a person has with her body, the accuracy of her mental representation of her body weight/shape, her drive for thinness, the degree of internalization of media messages about being thin or fat, or some combination of these aspects (Barker & Galambos, 2003; Webster & Tiggemann, 2003; Polivy & Herman, 2004). Body image is most commonly operationalized in the literature in one of two ways: as the degree of body dissatisfaction and as body image distortion (the inaccurate perception of one's shape or weight).

Body image disturbance, a broad term which encompasses intense body image dissatisfaction, body image distortion, self-evaluation unduly based on body weight and shape, or denial of life-threatening low body weight status, is used as an umbrella term in the literature and is often used interchangeably with more specific terms. In general, body image disturbances and problems have been the subject of much research due to well-established association with disordered eating and risky weight loss methods (Barker & Galambos, 2003; Phares et al., 2004; Polivy & Herman, 2002; Webster & Tiggemann, 2003). Body image disturbance, as defined above, is also a criterion for the major clinical eating disorders outlined in the DSM-IV (American Psychiatric Association, 1994).

There appears to be a need for greater precision in terminology and greater consensus among researchers about which aspects of body image are most salient to individuals and most useful for public health research and program development. Most body image studies measure body image dissatisfaction. However, as mentioned in the previous chapter, it is so pervasive that it may not be a sensitive indicator of distress or risk for subsequent unhealthy eating and dieting behaviors.

Body image distortion (BID), on the other hand, with its characteristic presence of cognitive distortion about one's body weight or shape, may be a more accurate and conservative measure of body image disturbance. One study notes that BID and body image dissatisfaction are correlated but not synonymous; and that BID is preferable to body image dissatisfaction as an indicator of body disturbance because BID is a more stable measure over time. Also, BID is less subject to respondents' mood fluctuations than body image dissatisfaction, which is highly mood contingent (Masheb, Grilo, Burke-Martindale & Rothschild, 2006). In a study among men with eating disorders, it was found that assessing body weight perception (i.e., distortion) is more important than assessing body weight ideal (i.e., thin ideal) because it differed significantly between the men with clinical eating disorders and non-clinical controls, though there was no difference in the two groups' body weight ideals (Mangweth et al., 2004). Despite such endorsements of BID as a preferred indicator of risk for disordered eating, fewer studies have been conducted using body image distortion than body image dissatisfaction.

A study based on the Add Health data found that body image distortion, derived from comparing a person's BMI to their perceived weight and shape, is an acceptable

indicator of body image (Harris, King & Gordon-Larson, 2003). Although one study claimed that the accuracy of weight perception alone was not a sufficient marker of disordered eating (Dring, Singlehurst & Hutton, 2004), the consistent positive association between body image distortion and disordered eating is well documented (Mangweth et al., 2004; Page, Lee & Miao, 2005; Talamayan, Springer, Kelder, Gorospe & Joye, 2006). While only a small percentage of people with body dissatisfaction or distortion will develop eating disorders, nearly everyone with an eating disorder suffers some type of body image disturbance.

Aside from its status as a risk factor for eating disorders, studies have found that body dissatisfaction by itself during adolescence is associated with host of other negative outcomes, especially for females. These include decreased effectiveness of weight loss efforts (Field et al., 2003), increased depression (Stice & Bearman, 2001), anxiety, relationship insecurity (Cash et al., 2004), decreased exercise, decreased awareness of bodily self-regulatory cues such as hunger; and greater susceptibility to internalization of thinness ideals (Barker & Galambos, 2003; Ackard et al., 2003).

Risky Weight Loss Behaviors

Weight loss behavior has been defined as the voluntary restriction of food type or calories, especially for the purpose of losing weight (Ikeda, 2001). Current research indicates that weight control behavior itself may put children at risk for health and mental health problems (Field et al., 2003; Sinton & Birch, 2005). Not only is dieting rarely an effective weight loss strategy, it may actually lead to weight gain in children (Field et al., 2003; Ikeda, 2001). Moreover, dieting behavior has been associated with disordered eating, decreased self-esteem, depression, suicidal ideation, and stress (Neumark-Sztainer

& Hannan, 2000). Restriction theory explains that repeated attempts to restrict food intake may trigger chaotic patterns of eating based on restraint-binge cycles, interfere with normal bodily hunger cueing, and result in weight gain as well as psychosocial distress (Ackard et al., 2003). These connections between dieting, body image disorders, eating disorders, and obesity highlight the importance of dieting behavior itself as a risk factor for other problems, including body image disturbance, especially among children and adolescents.

"Disordered eating" is a useful term found frequently in the literature that encompasses eating disorders but is not limited to the clinical syndromes. Disordered eating encompasses unhealthy or unnecessary weight loss behavior (e.g., when a person is in the normal BMI range); unsafe weight loss strategies such as the use of vomiting, laxatives, diet pills or fasting; and patterns of eating that are unhealthy and that interrupt the body's normal self-regulative cueing system for hunger and satiety (Johnson, 2000), such as bingeing and restriction. Adolescent weight loss behavior in particular tends to be unsupervised, improvisational, extremist, marked by binge eating, and often secretive (Nichter, 2000). Given the unhealthy characteristics of adolescent weight loss behaviors and the research that highlights the risks of dieting in childhood and adolescence, there is a need for research on the factors that lead to weight loss behaviors, especially when girls are normal weight.

Gender Displays and Body Image

Gender displays refer to the symbolic enactments and "performance" of femininity or masculinity as these gendered categories have been constructed and agreed upon in one's society and social or familial groups (Oswald et al., 2005; West &

Fenstermaker, 1995; Baber, 1994; Goffman, 1977). These gender displays, also known in the literature as "doing gender" (West & Zimmerman, 1987; Lloyd, 1998), "sexual scripts" (Baber, 1994), and "gender projects" (Thorne, Best & Strate, 2003), allow adolescent girls to accomplish and assert their femininity in ways that may win or maintain group membership, foster identity formation, assure a male of his masculinity through a display of "feminine" difference, or secure benefits within a patriarchal context (Frost, 2001; West & Zimmerman, 1987; Stiebling, 1999). Indeed, research has shown that social stratification occurs among adolescents based on physical attractiveness (Katz, 1999); and that there are considerable discriminatory and sometimes violent consequences for adolescents who do not conform to rules of unambiguous gender display (Wyss, 2004; Lucal, 1999; Oswald et al., 2005).

Feminine gender displays occur on many levels, e.g., physical appearance, communication styles, emotional display rules, behavioral protocols, and coping strategies, for gender is seen as omnirelevant (West & Zimmerman, 1987; Connell, 1987) along with race and class (Collins et al., 1995). Mahalik and colleagues developed a measure of feminine role stereotypes, the Conformity to Feminine Norms Inventory (Mahalik, Morray, Coonerty-Femiano, Ludlow & Slattery, 2005) based on a review of the literature and several phases of focus groups. They identified eight subscales, including the following: being nice in relationships, thinness, modesty about one's talents and abilities, investment in romantic relationships, and investment in physical appearance (Mahalik et al., 2005). Other researchers have also included passivity and conflict avoidance (Ghaderi, 2003), discomfort with anger (Edman & Yates, 2004), a low degree of self-determination (Pelletier, Dion & Levesque, 2004) and the desire to be

"nice" (Thorne & Luria, 1999) in their formulations of female gender stereotyped behaviors, or gender displays. Perceptions of physical attractiveness form the basis for much of the social ranking and stratification that occurs in our society (Katz, 1999), especially among adolescents (Eder, Evans & Parker, 1995), and this adds to the anxiety girls and young women have about their bodies and their desire to conform to gendered expectations, appearances, and roles.

Feminine gendered behaviors are associated with increased risk for disordered eating (Murnen & Smolak, 1997). One study suggested that people with anorexia and bulimia inhibit negative emotions more than non-affected women (Edman & Yates, 2004). In a different study using structural equation modeling, data supported a causal relationship between a problem avoidance coping style and development of disordered eating (Ghaderi, 2003). In a qualitative study, researchers found that women's tight social networks often reinforce negative, punitive messages about the inadequacy of one's female body (Paquette & Raine, 2004). As such, these close relations foster internalization, reproduction and sometimes amplification of social control mechanisms by which women are objectified, trivialized, and silenced (Paquette & Raine, 2004). Adherence to rigid gender roles and norms (gender displays) may be a form of self-policing by adolescent girls to ensure they get access to the currency that restrained femininity seems to promise (Morrison et al., 2004), but perhaps without the full knowledge of the costs to their sense of power, range of allowable behaviors, and bodily integrity until a time of later reflection in adulthood (Paquette & Raine, 2004).

Self-esteem, Body Image, and Weight Loss Behavior

The classic definition of self-esteem is the positive or negative regard one has for oneself, including an overall perception of one's value or worth (Rosenberg, 1965). High self-esteem refers to positive self-regard and low self-esteem to negative self-regard. This definition is consistent with two widely used measures of self-esteem: the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1989) and the global self-esteem subscale found on the Self-Esteem Questionnaire (SEQ) (DuBois, Felner, Brand, Phillips & Lease, 1996). Within a Symbolic Interaction framework, self-esteem is viewed as one of the four main components of self-concept; and it is thought to develop over time through significant interpersonal interactions, life experiences, and opportunities to acquire skills and display mastery (Owens, 2003). Self-esteem is important to the study of body image for several reasons.

First, in adolescence the changing body becomes highly salient to self-concept formation and may become synonymous with the self (Frost, 2001; Brumberg, 1997). Consistent with self-concept theory, the construction of one's body image is socially influenced through reflected appraisals. Reflected appraisal is also a component of self-concept and posits that self appraisal is derived from the reflected self, i.e., how one thinks others view and appraise one's body, value and worth. I suspect that this process renders adolescents, who are forging their self-concept, particularly vulnerable to internalizing the gendered attitudes of family and society about the female body.

Second, low self-esteem has been associated with body dissatisfaction (Murris et al., 2005; Wood, Waller & Gowers, 1994) and to development of disordered eating (Ghaderi, 2003). The self-consistency theorem of self-concept (based in Symbolic

Interaction theory) posits that individuals seek to validate and confirm their self-concepts, even if negative (Owens, 2003). Thus, consistent with current research cited above, we would expect that girls with low self-esteem will be more likely to develop body image distortion and engage in weight change behaviors; since body image distortion, by definition, is a negative appraisal of one's physical self that is inconsistent with objective measures. Theoretically, those with low self-esteem will seek negative confirmation about the self and thus pay more attention to negative/inadequate female body messages in their environments and society, which negatively affects their body image. Research has shown that low self-esteem increases an adolescent's tendency to engage in social comparison, which in turn increases body dissatisfaction (Murris et al., 2005).

Finally, self-esteem is important to the study of body image is because in many areas, high self-esteem has been linked to resiliency and protective mechanisms and low self-esteem to greater risk for adverse behaviors and experiences. In this study we are interested in self-esteem as a potential outcome of gendered parenting and as a predictor of body image distortion. Although self-esteem is a robust protective factor, to my knowledge no studies have examined whether gendered parenting attitudes predict self-esteem among adolescents.

Locus of control

Locus of control, ranging from internal to external, refers to the beliefs people hold about how much control they have over events and outcomes in their lives (Rotter, 1990). People with internal locus of control believe that they determine the outcomes of their lives and that success is due to one's own effort. On the other end of the continuum, people with external locus of control believe that luck or chance determines life outcomes

and that events and circumstances are out of their control (Rotter, 1992). Locus of control is a construct that has been linked to many areas of personal and health behaviors, including several studies on locus of control and body image (Pokrajac-Bulian & Zivcic-Becirevic, 2005; Parsons & Betz, 2001).

Other body image research has studied concepts closely related to locus of control, such as the relationship between degrees of self-determination and how much pressure women experienced from media images and oppressive body type ideals (Pelletier et al., 2004). Pelletier and colleagues outline a continuum of self-determination, from making choices that fully express oneself and values on one end; to conforming to the pressures and expectations of those in the environment on the other. These researchers classify the ends of the continuum as self-determined (intrinsically motivated) or non-self-determined (extrinsically motivated), reflecting one's capacity for autonomous action. These researchers found that the higher the self-determination, the less women perceived pressure from media messages to achieve body type ideals (Pelletier et al., 2004). They found that those who were intrinsically motivated toward action were able to assess whether or not a media image fit with their value system, and dismiss it if it did not fit with their values. Higher self-determination scores were also correlated with decreased symptoms of bulimia. They note that women who are high on self-determination are likely to have an array of interests, competencies, and pursuits beyond appearance concerns; and that these additional areas of competence make them less susceptible to criticisms about their physical appearance or ornamental virtues (Pelletier et al., 2004).

Studies examining body image and locus of control suggest that internal locus of control, intrinsic motivation, and self-determination may reduce susceptibility to body image disturbances among women. This is consistent with the Interpersonal Competence theorem under Symbolic Interactionism described earlier. Given the passivity and lack of autonomous action that have been part of patriarchal feminine socialization, it was expected that internal locus of control would predict lower odds of body image distortion and weight loss behavior. Unfortunately, there was only one item in Add Health with which to measure locus of control, and it was a poor measure of the construct so was eliminated from the final model.

Physical Vitality (Wellness)

While a plethora of research exists on negative body image (distortion, dissatisfaction, dysmorphia), there is almost no research on positive body image (Williams, 2004). Baber has noted a similar lack of positive conceptualizations of young women's sexual identity, vitality, and physical pleasure in current research (Baber, 1994). Additionally, for adolescents there is a lack of measures that define and operationalize a sense of health, wellness, and vitality as it is experienced from within the body rather than about how the body looks. Even the term "body image" contains an inherent objectification, i.e., the "image" of one's body (even if favorable) is inevitably about how one appears to oneself or to others. There is a need for current research to expand beyond the limiting concept of "body image" to include measures of vitality, of how one experiences one's own body, and of the quality of relationship one has with one's body. These concepts have relevance to issues related to overall health, weight, exercise, food, and weight loss behavior; as well as to psychosocial well-being. While these measures do

not yet exist in the literature, several items from the Add Health data are available to create an approximation of how an adolescent may experience her body in terms of her sense of physical wellness and vitality. For this study, this construct includes measures of adolescents' perceived fitness, energy, health, and pace of recovery from illness.

In contrast to a sense of physical vitality, research shows that girls who view their bodies in an objectified manner, and who judge the worth of their bodies based on "ornamental" criteria, are at greater risk for disordered eating than those girls who viewed their bodies as "instrumental," thereby judging the worth of their bodies based on functional criteria such as strength (Gusella, Clark & van Roosmalen, 2004). Interestingly, they found that when girls were given a task to focus on the functional aspects of their bodies, they displayed little negativity about the self; however, when asked to focus on their bodily shape (the ornamental aspect), the same girls adopted a negative and critical affect. This suggests that there is potential to intervene on an individual level to facilitate perspectives toward the body-self that could mitigate the damaging effects of mass media's constant focus on the ornamental aspects of being female. There is a potential health benefit to training young women to focus on the functionality, dependability, and strength of their bodies to counteract the societal emphasis on the ornamental female body (Kelly et al., 2005; Neumark-Sztainer, Goeden & Story, 2004).

Another study that highlights the importance of internally-based criteria examined the effects of two types of motivation to exercise (Pelletier et al., 2004). They found that exercising for pleasure, fun, or enjoyment (intrinsic rewards) increased body satisfaction; but that the same amount and type of exercise, if conducted specifically in order to lose

weight (extrinsic rewards), increased body dissatisfaction. In the former instance, people were pursuing something they wanted (pleasure) that was immediately realizable; in the latter instance, people were pursuing something (thinness) that was contained in a disembodied, distant future (Pelletier et al., 2004). These findings have powerful implications for disordered eating treatment and prevention programs (including obesity) that have been largely overlooked, and that merit further research. This study intended to include the construct vitality; however due to collinearity issues (high correlation with self-esteem), this construct was eliminated from the study.

Parental Gender Attitudes and Body Image

Symbolic Interaction emphasizes family relationships as primary interpersonal environments in which role expectations and intersubjective meanings are constructed and enacted (White & Klein, 2002). Families are not immune to the sociocultural influence of pervasive female beauty images and stereotypical gender roles, but they do make choices and adopt values and attitudes that place them in the role of gatekeepers of the broader culture for their children. Families construct meanings around gender and expected roles that may shape their daughter's conformity or nonconformity to gender stereotypes (Frank, 1999; Hill, 2002; Phares et al., 2004). Socialization is the process of acquiring or "importing" a detailed knowledge of symbols, roles, beliefs, attitudes and norms of our culture(s) in order to resolve the challenges that arise (White & Klein, 2002).

Family behaviors have been found to influence body dissatisfaction and weight loss behavior among adolescents. Body image disturbance and weight loss behavior behaviors have been correlated with parental criticism about what a child is eating,

teasing a child about her weight or body, and with parental praise for calorie restriction (Polivy & Herman, 2002). Parental attempts to restrict food intake too rigidly are ineffective weight loss strategies and actually promote weight gain (Fisher & Birch, 2002). In contrast, another study found that teens' perceptions of parental autonomy granting were correlated with lowered odds of weight control behaviors (Polivy & Herman, 2002).

One team of researchers found that high parental expectations (in areas other than weight and appearance) of their adolescents were protective against body dissatisfaction (Young et al., 2004). On the other hand, these researchers also found that perceived high expectations from the parent(s) to lose weight predicted body dissatisfaction. A study examining family level risk factors with regards to adolescent body dissatisfaction found that for girls, family efforts to try to be thin, greater frequency of appearance-focused teasing in the family, and higher frequency of church attendance all predicted body dissatisfaction (Barker & Galambos, 2003).

These studies highlight the importance of family attitudes on adolescent weight concerns. Moreover, a feminist sociocultural perspective suggest that developing girls' resistance to pernicious feminine stereotypes could be protective (Frank, 1999; Ward & Benjamin, 2004); and Symbolic Interaction framework suggest that parents influence attitudes toward gendered role prescriptions through the construction of shared meaning. While parental/family emphasis on external appearance and criticism of bodily characteristics has been correlated with body image problems, to my knowledge, no study has empirically examined whether gendered attitudes in general among parents elevates

the risk of a daughter developing weight concerns; or whether non-gendered attitudes are protective for girls.

Family Social Support and Body Image

Social support from family, friends, and school is an important potential protective factor among adolescents against developing body image distortion and unhealthy weight loss behavior (Barker & Galambos, 2003) as well as against depression and psychological distress (Cornwell, 2003; Mellin, Neumark-Sztainer, Story, Ireland & Resnick, 2002). Moreover, perceived deficits in social support have been linked to increased vulnerability among adolescents to body dissatisfaction, pressures to be thin, and/or to the onset of binge eating (Stice, Presnell & Spangler, 2002; Stice & Whitenton, 2002; Ghaderi, 2003).

There are numerous types of social support that are commonly measured in research, such as emotional, instrumental, and informational. However, according to the Handbook on Social Support and the Family (Pierce, Sarason & Sarason, 1996) and a review of the literature, it appears that emotional social support is the type most salient to adolescent well-being and to outcomes related to body image and weight loss behavior (Perrin & McDermott, 1997; DeGoede, Spruijt & Maas, 1999; Stice et al., 2002; Furman & Buhrmester, 1985). A common understanding of emotional social support among adolescents in the literature is the sense of being cared about, valued, loved, understood, and having someone available who can listen and offer encouragement (Cornwell, 2003; Pierce et al., 1996). In a classic study, researchers found that adolescents look to different people in their social networks for different types of support (Furman & Buhrmester,

1985), and that the qualities of support that middle school pre-adolescents turned to most often from mothers and fathers included affection and affirmation of self-worth.

Emotional social support as perceived by adolescents has been operationalized in different ways in the literature, ranging from single items to broad, composite indexes. Some studies of social support and body image have adapted items from the widely used Network of Relationships Inventory (Furman & Buhrmester, 1985) to specify multiple dimensions such as affection, admiration, guidance, and intimacy (Stice & Whitenton, 2002; Stice & Bearman, 2001). Others have derived composite measures of parental social support from items such as parent-child bondedness, shared activity, communication, and family cohesion (Crosnoe & Elder, 2004). The common thread in each of these definitions is a sense of caring, affection (i.e., closeness), and connectedness.

Age

Given that the body is undergoing rapid pubertal changes during early adolescence, body perceptions and distortion among early adolescents may differ from those of later adolescents. Researchers have noted that during early adolescence (middle school), gender stereotypes are heightened and often strictly enforced within peer groups (Berk, 2003). Identity is a primary task of adolescence (Erikson, 1963), and peers become a primary reference group during identity formation processes. Practitioners have observed that much of middle school peer social behavior, including the display of uncontestable "feminine" or "masculine" behavior is part of a larger effort to maintain group membership and attain social status (Wiseman, 2002; Henslin, 1999). Early adolescents' physical bodies are changing at a faster pace than physically will ever occur

again, and girls' increase in pubertal body fat is often accompanied by the fear of becoming fat (Sobal & Stunkard, 1989). These rapid physical changes and anxieties lead them to seek unambiguous role clarity and quick answers about the social meaning of their emerging physical and sexual selves.

In contrast to middle school, during the high school years, adolescents' growing cognitive abilities foster greater tolerance for views other than their own, greater tolerance for ambiguity around moral issues, and greater interest in socializing across lines of difference (Berk, 2003). What happens to body satisfaction trajectories during that period? Empirical studies are inconclusive, and have lent support for both stability and increasing dissatisfaction (Jones, 2004). Unfortunately, no studies have documented an increase in body satisfaction for girls over the course of adolescence, although we do see an increase in body satisfaction for boys (Harris et al., 2003). In an ironic twist of fate, as girls grow up into women, with the normal addition of fatty deposits and curves, they move farther away from the cultural thin-ideal for women; but as boys develop, with the normal addition of muscle bulk and broadening of the shoulders, they move closer to their muscularity-ideal for men (Jones, 2004; Harris et al., 2003; Murris et al., 2005). In other words, in our current culture, normal girl body growth is spurned, while normal boy body growth is celebrated as a status marker.

Race/Ethnicity, body image, and weight loss behavior

The relationship between race/ethnicity and body image and weight concerns is contradictory at this time. For example, several studies conducted with college-aged African Americans (James et al., 2001), American Indians (Story et al., 1997) and Spanish-speaking participants (Beato-Fernandez et al., 2004; Raich et al., 2001) reported

body dissatisfaction and disordered eating or weight loss patterns similar to studies with Whites. However, in other studies, compared to White girls, African American girls tended to have a more positive body image, have less concerned about weight and shape (Godley, 2004), report lower rates of body image distortion, and report less weight control behavior (Strauss, 1999).

Several explanations for the discrepancy between African American girls' and White girls' body satisfaction have been examined. In a qualitative study examining how Black and White adolescents interpret (the typically White) beauty images found in fashion magazines, one researcher found that minority girls said they did not identify with the "White" images nor did they believe that others judged them this way (Milkie, 1999). Their dismissal of these beauty images may have protected them from engaging in self-critical social comparisons. Although the media is often conceptualized as the culprit within the sociocultural explanatory models, this study demonstrates what other researchers have asserted as well, that media images are mediated by individual interpretation (Murris et al., 2005).

African American girls' potentially greater ability to dismiss White thin ideals may protect them from internalizing these as standards of physical beauty (Basow & Rubin, 1999); and indeed other studies have shown that internalization of thin ideals functions as mediator through which body dissatisfaction occurs (Jones, Vigfusdottir & Lee, 2004). In contrast, experimental studies do show that for White and Hispanic women (who may be more susceptible to identification and social comparison with predominately light-skinned models), exposure to appearance-oriented magazines does

tend to increase body dissatisfaction, decrease self-esteem and elicit negative affect (Hawkins et al., 2004).

Finally, while many studies have examined differences *between* race/ethnic groups on measures of body image and weight loss behavior (Strauss, 1999), few quantitative studies have examined –or described- variation in body image and weight loss behavior *within* race/ethnic groups by family factors, individual factors, or socioeconomic indicators, perhaps due to limited statistical power. If sample size permits, this study will include descriptive data on body image and weight loss behavior both between and within racial/ethnic groupings by subcategories, as recommended by feminist researchers (De Reus et al., 2005). In addition, other than the potential explanations outlined above, very few studies have tested hypotheses about why African American girls' show greater resilience against poor body image and weight loss behavior than girls in other racial/ethnic groups.

Definitions

Constructs and terms appearing in this chapter are defined below. Definitions of variables constructed for use in this study are summarized in Table 1.

Body Image

In this study, body image is defined as the perception a person has regarding her weight status (e.g., about right, underweight, overweight).

Gender Displays

Gender displays are behaviors that perform and reinforce female gender stereotypes, such as high social passivity and "niceness" (conflict avoidance), and high investment in appearance (attention to grooming, high physical attractiveness).

Gendered Self-concept

Gendered self-concept includes gender displays but also includes aspects of self-concept that have been found in the literature to differ among girls and boys. For example, self-esteem is generally lower, and social passivity and appearance investment higher, among girls than boys. Gendered self-concept may also include aspects that have distinct gendered patterns over time. For example self-esteem has been found to drop for girls around the time of puberty, and so maintenance of high self-esteem for girls challenges a gendered developmental pattern.

Social Passivity

Social passivity refers to the degree to which a girl refrains from argumentation, debate, and criticism of others.

Appearance Investment

Appearance investment refers to the degree to which a girl invests time and resources into grooming and maintaining her physical appearance.

Self-esteem

Self-esteem refers to the degree of positive or negative regard a person has for herself as well as her perception of feeling worthwhile and accepted by others.

Parent Traditional Attitudes

Traditional parent attitudes refer to whether or not a parent holds stereotypical or non-stereotypical views on the most important thing for a girl to learn. Parent attitudes

are considered traditional if they report that being well-behaved, popular, or to help others is the most important thing; and they are considered non-traditional if they report that thinking for oneself or working hard is the most important thing for a girl to learn.

Family Social Support

Social support refers to the degree to which a girl perceives that her family understands her, pays attention to her, has fun together, and cares about her.

Age of Adolescent

The age of the respondent refers to the age at the time of the wave 1 interview; age was calculated by using the date of the interview, and the date of birth of the respondent. Two age groups were considered, early adolescence (ages 12-15), and later adolescence (ages 6-21).

Race/Ethnicity

Although respondents' were allowed to report multiple ethnic identities, for purposes of this study, a single race/ethnicity category was assigned based on the following order: Hispanic, African American, White, Asian, Other.

Parent Education

Parent education refers to the highest educational level achieved by either parent.

Table 1

Definitions of Analyzed Variables

Variable	*Definition*
Dependent Variables	
Body image distortion (BID)[a]	Condition in which a girl perceives her body weight status to be heavier than as determined by objective classification of her weight status based on gender, age, height and weight (BMI).
Risky weight loss behavior	Report of using any one or more of the following methods in the last seven days specifically to lose weight: diet pills, vomiting, laxatives.
Dieting to lose weight	Report of dieting specifically to lose weight in the last seven days.
Exercising to lose weight	Report of exercising specifically to lose weight in the last seven days.
Trying to lose weight	Participant marks that she is "trying to lose weight" among the following options: trying to lose weight, gain weight, stay the same weight, or not trying to change weight.
Independent Variables	
Social passivity	Social "niceness, " i.e., the degree to which a person agrees with the statements "I never argue with anyone" and "I never criticize anyone."
Appearance investment	Degree to which a person invests time and resources into grooming and physical appearance. Interviewer rated.
Self-esteem	Degree of positive or negative regard a person has for herself as well as her perceptions of worth and acceptance by others.
Parent traditional attitudes	Traditional gender attitudes based on parental beliefs about the most important thing for a girl to learn. Attitudes are considered traditional if parent selects to be well-behaved, to be popular, or to help others and non-traditional if they select to think for themselves or to work hard.
Moderator Variable	
Family social support	Degree to which respondent perceives that her family understands her, pays attention to her, has fun together, and cares about her.
Background Variables	
Race/ethnicity	Respondents could mark more than one category, so a single race/ethnic classification was assigned in this order: Hispanic, African American, White, Asian, Other.
Age	Age at time of wave 1 interview, calculated by using the date of the interview, and the date of birth of the respondent. Age range is 12-21 years old, coded into two groups: early adolescence (12-15) and later adolescence (16-21).
Parent education	Highest level of education attained by either parent, coded into four groups: less than HS, HS or GED, some college, and college degree or beyond.

[a]BID is used as a dependent variable in model 1, an independent variable in models 3 and 5, and a mediator in model 4.

Research Questions and Hypotheses

Six research questions and seventeen specific hypotheses were planned and are summarized in Table 2. Together these research questions test paths of family and gender socialization influences through self-concept on cognitive mechanisms (body image distortion) that may lead to the development of disordered eating and risky weight loss among adolescent girls in the U.S.

Conceptual Model

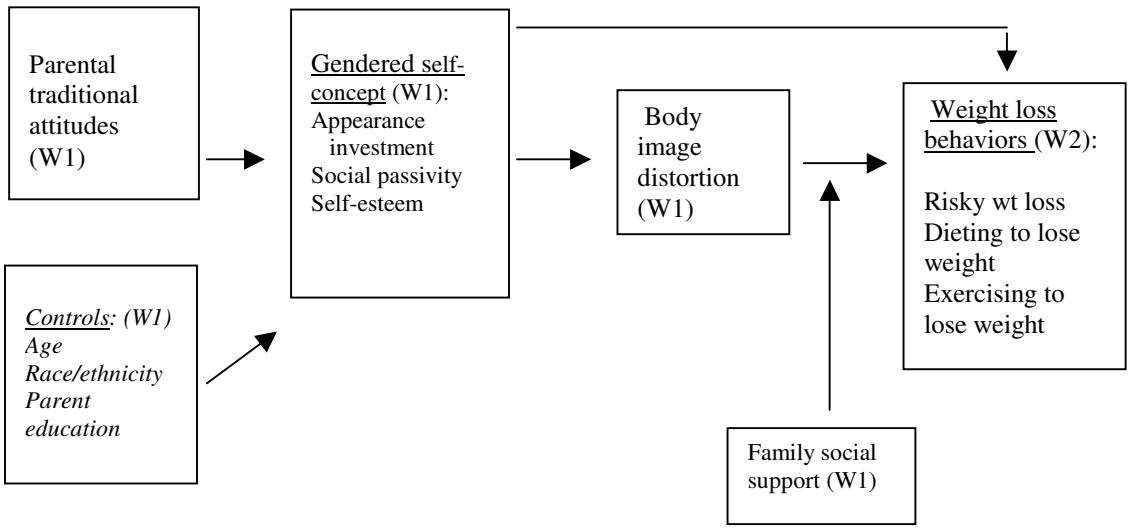


Table 2

Summary of Research Questions and Hypotheses

Research Question	*Hypotheses*
1. Is gendered self-concept associated with body image distortion among girls?	1a) Higher social passivity will be associated with increased likelihood of body image distortion. 1b) Higher appearance investment will be associated with increased likelihood of body image distortion. 1c) Higher self-esteem will be associated with decreased likelihood of body image distortion.
2. Does gendered self-concept at wave 1 predict the onset of weight loss behavior one year later (at wave 2, controlling for weight loss behavior at wave 1)?	2a) Higher social passivity will predict greater likelihood of using risky methods to lose weight. 2b) Higher appearance investment will predict greater likelihood of using risky methods to lose weight. 2c) Higher self-esteem will predict decreased likelihood of using risky methods to lose weight. 2d) Higher social passivity will predict greater likelihood of dieting to lose weight. 2e) Higher appearance investment will predict greater likelihood of dieting to lose weight. 2f) Higher self-esteem will predict decreased likelihood of dieting to lose weight.
3. Does body image distortion at wave 1 predict the onset of weight loss behavior one year later (controlling for weight loss behavior at w1)?	3a) Body image distortion at time 1 will predict greater likelihood of using risky weight control methods at wave 2. 3b) Body image distortion at time 1 will predict greater likelihood of dieting to lose weight at wave 2.
4. Does body image distortion mediate the relationship between self-concept and weight loss behavior?	4a) Body image distortion will mediate the relationships between significant self-concept predictors (e.g., social passivity, appearance investment, self-esteem) and use of risky weight loss methods. 4b) Body image distortion will mediate the relationships between significant self-concept predictors and dieting to lose weight.
5. Does family social support reduce risky weight loss behavior and buffer the effect of body image distortion on risky behavior?	5a) Greater family social support will predict decreased likelihood of risky weight loss behaviors among girls. 5b) Greater family social support will moderate (weaken) the predictive relationship of body image distortion on risky weight loss behavior.
6. Are parental traditional gender role attitudes associated with gendered self-concept among their daughters?	6a) Greater traditional gender role attitudes of parents will be associated with higher social passivity. 6b) Greater traditional gender role attitudes of parents will be associated with higher appearance investment.

Chapter 3: Methods

Data

Secondary analyses were conducted on data from waves 1 and 2 of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a nationally representative study of adolescent students in grades 7-12 in the United States first conducted in 1994-1996. Add Health data are based on a stratified, random sample of high schools in the United States. In order to retain numbers of participants in each grade over time in the study, each high school was matched with a $7^{th}/8^{th}$ grade "feeder" school that was also recruited for the study. Schools were stratified into clusters by region, urbanicity, school size, school type (private, public, parochial), and racial mix in order to ensure diversity in the sample. Over 70% of the randomly selected schools agreed to participate in the study. The individual response rate within the clustered school samples was 78%.

Data collection for Wave 1 occurred in two phases: the in-school questionnaire (completed by students in school) and the in-home survey (completed by students and one parent in the home). The in-school surveys were completed by over 90,000 youth from approximately 130 schools in 80 different communities across the country in 1994-1995. School administrators were also asked to complete a survey about the school climate, policies, and student body at that time. The second phase of Wave 1 consisted of in-depth interviews lasting one to two hours with the student (student survey) and a parent (parent survey) in homes in 1995. This in-home sample consisted of a core sample of about 12,000 nationally representative students and additional special samples of

groups such as twins and disabled youth to ensure large enough sample sizes for sub-group analyses. One year later, in 1996, the in-home, parent, and school administrator surveys were repeated, and these data constitute Wave 2. (However, the in-school survey, which was an abbreviated form of the in-home survey completed by adolescents, was not repeated in Wave 2.)

This study uses data from waves 1 and 2 of the in-home student survey completed by adolescents , and from waves 1 on the parent survey, completed by a parent or guardian, usually the mother. Add Health data are available in both a public use version and a restricted version; these data are drawn from the former. The Add Health study is funded by the National Institute of Child Health and Human Development through the Carolina Population Center, University of North Carolina at Chapel Hill, and receives cooperative funding from seventeen other federal agencies. Add Health is considered the most comprehensive and largest survey of adolescents ever conducted in the U.S. Wave 3 was released in 2005, and Wave 4 and 5 are under development.

Sample

A sub-sample of Add Health consisting of all girls in Wave 1 and/or 2 is analyzed to respond to the research questions of this study (n=3356 in wave 1; n=2370 observations with data for both wave 1 and 2). To take advantage of the longitudinal data available, the predictor variables are taken from the sample in wave 1 and the final outcome variables of interest (weight loss behaviors) are taken from the sample in wave 2. The proposed mediator variable (i.e., body image distortion) is taken from wave 1. In customary manner, the moderator variable (i.e., family social support) is treated as background variable and is taken from wave 1 accordingly. Due to purposive

oversampling of certain groups in the research design, normalized weights are used for all samples to allow for generalization to the U.S. population of students in grades 7-12. Weights for each wave are identified in the documentation on weights provided on the Add Health website. Table 3 illustrates frequencies, means, and standard deviations for the background characteristics of the sample.

Table 3

Descriptive Statistics of Sample, All Girls at Wave 1

Variables	M	Frequency	%	SD	Range	N	Missing
Race/ethnicity						3353	3
Hispanic		416	12.4		1		
African American NH		545	16.2		1		
White NH		2255	67.2		1		
Asian NH		93	1.4		1		
American Indian NH		17	.5		1		
Other NH		27	.8		1		
Age[a]	15.9			1.79	12-21	3354	2
Early adolescence		1447	43.1		1		
Later adolescence		1907	56.9		1		
Parent education						3307	49
Less than high school		549	16.6		1		
High school or GED		1092	33.0		1		
Some college		883	26.7		1		
College degree		783	23.7		1		

Note: All values are weighted to provide national estimates among high school aged girls, 1994-5. [a]Early adolescence = 12-15 years, later adolescence= 16-21.

Measures

The student in-home survey and the parent survey source question items utilized in this study were developed and tested by the Add Health research team at University of North Carolina – Chapel Hill during the survey development phase of the study. The variables and constructs of interest constructed and recoded for use in this study include: demographic variables (gender, age, race/ethnicity, parent education), gendered self-concept variables (social passivity, appearance investment, and self-esteem), beliefs (body image distortion), behaviors (risky weight loss behavior and dieting to lose weight), family social support, and family gender-related traditional attitudes. These variables and constructs are operationalized using items from the Add Health data as described below and summarized in Appendix A.

Demographic Variables

Demographic variables, used as controls, include students' age, race/ethnic identification, and parent education as a proxy for socioeconomic status. (Unfortunately, region and urbanicity variables, appearing on the school administrator survey, are not available in the public use version of Add Health.) Age at interview was calculated by subtracting the year and month of interview from the year and month of birth (converting difference in years to months first, subtracting the -/+ difference in months, and converting back to years). Respondents are permitted to mark more than one race/ethnic identification on the survey and so a single race/ethnic designation was forced based on the following order: Hispanic, African American, White, Asian, American Indian, and Other. Parent education reflects the highest level of education achieved by either parent. Data are taken first from the parent survey, which has over 400 missing observations; and

secondly from identical question items found on the in-home student survey. This process of data recovery is described under missing data treatment below.

Body Image

Body image refers to girls' perceived weight status and is determined by students' response to the question item on the survey, "How do you think of yourself in terms of weight?" (e.g., very underweight, slightly underweight, about right, slightly overweight, very overweight). Body image, or weight status perception, is thus distinct from CDC's BMI weight status classification and may represent an accurate or distorted perception. Body image is a temporary variable used to construct body image distortion.

Body Mass Index

Self-reported height and weight from wave 1 are used to calculate body mass index (BMI = weight (pounds) / height^2 (inches) * 703). However, BMI score alone is not an interpretable measure for children ages 0-21 and should not be used as a continuous variable until adulthood. Instead, categorical weight status assignment is utilized, as discussed below.

Weight Status

Weight status refers to the BMI classification for children and adolescents (aged 0-21) developed by the Centers for Disease Control. Age-adjusted growth charts for height and weight (Centers for Disease Control, 2000) are utilized to assign each respondent a weight status (i.e., underweight, healthy weight, risk for overweight, or overweight) based upon her age in months, gender, and BMI score.

By CDC's standards, a girl is classified as overweight when her BMI is equal to or greater than the 95th national percentile BMI for children of her age and gender. A girl

is classified as at risk for overweight when her BMI equal or greater than the 85th percentile and less than the 95th. Girls are classified as having a healthy wieght when BMI range is from 5th percentile to under the 85th. Finally, girls are classified as underweight when their BMI is less than the 5th percentile for age and gender (Centers for Disease Control, 2000).

Body Image Distortion

In keeping with a previous study based on Add Health, body image distortion is determined by comparing BMI weight status with subjects' perceptions of weight status (Harris et al., 2003). Similarly, in this study, body image distortion is conceptualized as a dichotomous variable, and is constructed based on several items in the survey. Respondents' BMI-based weight status is compared to respondents' perceived weight status (i.e., very underweight, underweight, about right, overweight, very overweight) to determine if her perception is accurate or distorted. BID is coded as a "1" if there is any discrepancy between body image and BMI-based weight status, and a "0" if there is none. This variable is then recoded to depict the direction of distortion (overestimation or underestimation of weight).

Body image distortion in which a girl overestimates her weight is the type of BID considered most relevant to the study of pathways toward disordered eating and is the condition of interest in the multivariate analyses presented here. While there are two types of BID (i.e., overestimation and unerestimation), for this study BID is defined as the condition in which a respondent subjectively reports they are overweight or very overweight when in fact they are at or below the healthy weight range according to the CDC age-adjusted BMI growth charts.

In this study, BID is used as a dependent variable predicted by gendered self-concept factors and parent attitudes, a mediating variable between self-concept factors and weight loss behaviors, and an independent variable that affects weight control behaviors. See Appendix A for a list of the Add Health variables and survey questions used to construct the variables for this study.

Weight Loss Behavior at Waves 1 and 2

Weight loss behavior is based on subjects' report of trying to lose weight in the last seven days by one or more of these methods: exercising, dieting, diet pills, vomiting, or laxatives. Subjects are first asked if they are trying to lose, gain, maintain, or not trying to change their weight. Subjects are then asked to check any methods they have used in the past week to lose weight. Weight loss behaviors are operationalized in three different ways, and each is coded as a dichotomous outcome variable. The first dependent variable is risky weight loss behavior, and it is operationalized as the subject's reported use of laxatives, diet pills or vomiting to lose weight.

The second dependent variable, dieting to lose weight, is operationalized as a subject's reported use of dieting to lose weight. The third dependent variable, use of exercise to lose weight, is not in the hypotheses but is included for comparison purposes as the least risky weight loss method. It is operationalized as a subject's reported use of exercise to lose weight. The same weight loss behaviors are surveyed at wave 1. These wave 1 variables are used as controls in the multivariate models in order to assess change in weight loss behavior over time.

Gendered Self-Concept

Girls' gendered self-concept is assessed by three variables. The first variable is self-esteem (6 items, Cronbach's alpha= .853). The second two variables are consistent with gender displays**,** as defined in the literature review. These variables are appearance investment (2 items, Chronbach's alpha = .686) and social passivity (2 items, Cronbach's alpha =.540).

Self-esteem.

Self-esteem is operationalized using six items from the in-home survey developed by the Carolina Population Research Center research team. Respondents are asked to rate agreement on a scale of 1-5 with statements such as, "You have a lot of good qualities," "You have a lot to be proud of," and "You like yourself just the way you are." During the diagnostic data procedures, a factor analysis was performed to make a determination about whether to include all or some of these items as indicators of self-esteem. All six items are retained (Cronbach's alpha= .853). Self-esteem items are measured at Wave 1. See Appendix A for the wording of the survey questions.

Appearance investment.

Appearance investment is constructed from two items taken from the in-home survey in Wave 1 that were reported by the interviewer. At the conclusion of the in-home interview with the student, the research interviewer indicated, on a scale of 1-5, respondent's attention to grooming, and level of physical attractiveness. The values for these items are summed to obtain an appearance investment measure at Wave 1, with higher values coded to mean higher investment.

Social passivity.

Social passivity is measured by two items that are summed to create a composite score with a range of 2-10. Students indicate their level of agreement, on a scale of 1-5, to these statements: "You never criticize anyone" and "You never argue with anyone." Items are coded so that a higher score indicates higher degree of social passivity. A third item, problem avoidance ("You usually go out of your way to avoid having to deal with problems in your life"), is not included in the final variable factor analysis of the 3-item measure suggests the third item represents a different construct than the first two items.

Family Social Support

The items selected to measure family social support are based on a previous Add Health study on family social support among adolescents (Cornwell, 2003). Family social support is typically operationalized in Add Health studies based on the following four items: my family understands me, my family pays attention to me, my family has fun together, and my parents care about me. Scores on these items are summed to create an index of perceived family social support (4 items, Chronbach's alpha= .784), with higher values coded to represent higher support. Family social support is measured at Wave 1 since moderator variables should be measured at the earliest possible time.

Parental Traditional Attitudes

Parental gendered attitudes (traditional and non-traditional) are operationalized based on responses to a single item from the Parent Questionnaire at Wave 1. Parent respondents are asked to select "the most important thing for a girl to learn" from a list of five options: to be well-behaved, to be popular, to think for themselves, to work hard, or to help others. Selections of being well-behaved, popular, or helping others are coded as

traditional parental gender role attitudes for girls and selections of thinking for oneself and working hard were coded as non-traditional attitudes.

Data Screening Procedures

Standard data screening and variable preparation procedures were followed prior to analysis (Tabachnick & Fidell, 2001). Univariate descriptive statistics (i.e., means, frequencies, standard deviation, distribution attributes, missing values) on each variable and composite variables were obtained using SPSS statistical package version 14.0 and evaluated. Missing data were inspected for the reason and percentage missing; and were either imputed, replaced with identical information from other survey items, or deleted listwise prior to analysis. The variable locus of control, measured by a single item, was dropped from the study as it was deemed a theoretically inconsistent measure of the construct (i.e., the internal locus of control item was positively correlated with social passivity and negatively correlated with self-esteem and vitality, opposite of what would be expected from the literature review and definition of the construct). Each of the remaining continuous predictor variables was sufficiently normally distributed; skewness and kurtosis were within acceptable range and no transformations were necessary.

Logistic regression, which is more flexible in its assumptions than linear regression, does not require predictor variables to be homoscedastic (i.e., equal variance of scores among independent variables in the case of ungrouped data); however this was assessed using binary scatterplots (Tabachnick & Fidell, 2001) among the predictor variables used in the linear regression analysis of this study. Multicollinearity of predictor variables was assessed by examining coefficients in a Pearson's Product-Moment correlation matrix and was found to be problematic in one instance (i.e., self-

esteem and vitality measures were highly correlated and redundant). Thus, the vitality variable was eliminated from all subsequent analyses to achieve singularity among independent variables; self-esteem was preserved over vitality because it is more closely aligned with gendered self-concept.

Variable Preparation

Variables assessed included demographic variables (Table 3), self-concept variables (Table 4), body image and BMI variables (Table 5), weight loss variables (Table 6), and family variables (Table 7). Additional testing on each composite variable was conducted, consisting of a Factor Analysis to obtain Cronbach's alpha on all scales. Based on these diagnostics, I eliminated one of the items on the social passivity scale that appeared to reflect a different factor than the other two items, and this improved the alpha.

Processes for preparing variables for analysis consisted of the following:

- Examination of variable distribution for outliers and normality
- Check items for directionality and reverse coded items as needed
- Recode and construct scale or summed variables
- Obtain Cronbach Alpha correlations on composite variables (e.g., self-esteem, social support, social passivity, appearance investment) to check for internal consistency.
- Conduct factor analyses on variable constructs with multiple items to check for appropriate clustering of variables around the constructs of self-esteem, social passivity, appearance investment, and social support.
- Check for normality of distribution on each new continuous variable.

- Made decisions about cut points for dichotomous categories as needed
- Address missing data issues with appropriate procedures, as described below .

Missing Data

Two methods were used to recover missing data for this study: imputation and triangulation. Imputation, conducted in STATA, calculates a regression equation for the variable selected for missing data recovery based on any number of theoretically sound independent variables selected by the researcher. Imputation was used on the following independent variables: self-esteem, social passivity, appearance investment, and family social support. Missing values were imputed only from other items within the same scale; if all items on the scale were missing the case was dropped. Triangulation refers to capturing missing data from a different item or survey to recover comparable information; it was used on the parent education variable and the process is described below. Following these procedures, remaining missing data were dropped via listwise deletion. Missing values were assessed for each individual variable and each construct variable.

Due to the large sample size in Add Health, only one of the variables had more than 3% missing cases, the parent education variable, which is taken from the parent survey that has a high rate of missing data. The parent education variable from the parent survey was missing 446 cases. To remedy this problem, I used triangulation with 2 questions on the student in home survey about their parents' education. They responded to a question about how far their bio/adoptive mother and bio/adoptive father had gone in school, and the response set was identical to the response set the parents used on the parent survey. I coded these questions so that I would obtain the higher educational achievement of the

two (mother or father) and used these data to replace missing data from the parent survey on matched cases. This reduced the total cases with missing data on parent education to within an acceptable range.

There were more missing data on the height and weight variables (source variables for both BMI and weight status) than was desirable, but since these affected my primary outcome variables, and were not variables that can be meaningfully or logically deduced from related responses, I accepted the loss of these cases. However the percent of missing data on BMI is still within an acceptable range (4.5%). Missing data on individual variables ranged from 5 to 149, or less than 1% to 5%. Missing data for less than 10% of cases is considered acceptable; however even small percentages of missing data on single items can accumulate and present a problem in the final sample so these were remedied when possible.

Final Sample Size

Three final sample sizes were established for analysis by dropping remaining missing data, as follows: 1) A sample size of 3151 (N=3151) was established for the analyses responding to research questions 1 and 2. These analyses were based on wave 1 data (Total N for Wave 1=3356). 2) A sample size of 2370 (N=2370) was established for the analyses responding to research questions 3 through 5. These analyses were based on respondents who completed both wave 1 and wave 2 questionnaires (Total N for Wave 2= 2519). 3) A sample size of 2751 (N=2751) was established for the analyses responding to research question 6. This analysis was based on wave 1 of both the student survey and one item in the parent survey, the latter of which has 440 missing cases. Therefore the sample size is smaller than that used for the other wave 1 analyses.

Attrition Analysis

A total of 837 observations from wave 1 (n=3356) were missing in wave 2 (n=2519), an attrition rate of nearly 25%, so an attrition analysis was conducted. A dummy variable for attrition was created; and participation in wave 2 was regressed on all wave 1 variables in the study. The only significant difference between those missing and not missing at wave 2 was age. Since it is likely that the age difference is due to natural phasing out of the sampling frame (i.e., students enrolled in high school), the ages of the attritors were examined in further detail. As suspected, 577 of the total 837 attritors were girls ages 17 or older at wave 1, so 69% of the attrition may be largely attributed to phasing out of the sampling frame of the study. The remaining attrition (260 observations) is 7.7% of the full sample at wave 1, and is proportionally distributed among the ages in years. Aside from age, as explained above, no significant differences between missing and non-missing cases were found on wave 1 variables.

Table 4
Descriptive Statistics for Gendered Self-concept Variables, Wave 1

Variables	M	α	SD	Range	N	Missing
Social passivity	4.92	.540	1.58	2-10	3335	21
Never argue	2.15		.931	1-5	3349	7
Never criticize	2.76		.977	1-5	3335	21
Appearance investment	7.36	.686	1.49	2-10	3353	3
Attention to grooming	3.66		.802	1-5	3354	2
Physical attractiveness	3.71		.900	1-5	3353	3
Self-esteem	24.22	.853	3.63	6-30	3347	9
A lot of good qualities	1.81		.66	1-5	3347	11
A lot to be proud of	1.76		.72	1-5	3343	12
Like yourself	2.18		.99	1-5	3345	10
Doing things right	2.32		.89	1-5	3346	10
Feel socially accepted	1.97		.77	1-5	3345	10
Feel loved and wanted	1.74		.74	1-5	3346	10

Note: All values are weighted to provide national estimates among U.S. high school girls.

Table 5

Descriptive Statistics for Body Image Variables, Wave 1

Variables	M	%	SD	Range	N	Missing (%)
Body mass index	22.19		4.35	12-46	3207	149 (4.4%)
Height in inches	64.16		2.98	48-79	3307	49
Weight in pounds	130.11		28.51	57-295	3241	115
Body image					3351	5
Perceives is overweight		40.7		0-1	3351	
Perceives is about right		49.1		0-1	3351	
Perceives is underweight		10.2		0-1	3351	
BMI-based weight status					3207	149 (4.4%)
Overweight		7.5		0-1		
Risk for overweight		13.8		0-1		
Healthy weight		71.9		0-1		
Underweight		2.4		0-1		
Body image distortion					3206	150 (4.5%)
Overestimates weight		23.3		0-1		
No distortion		61.0		0-1		
Underestimates weight		15.7		0-1		

Note: All values are weighted to provide national estimates among high school aged girls, 1994-5.

Table 6

Descriptive Statistics for Weight Loss Behaviors, Waves 1 and 2

Variables Wave 1 and Wave 2	Frequency	%	Range	N	Missing
Risky weight loss, W1	55	1.6	0-1	3356	0
Risky weight loss, W2	62	2.5	0-1	2519	0
Diet to lose weight, W1	705	21.0	0-1	3356	0
Diet to lose weight, W2	580	23.0	0-1	2519	0
Exercise to lose wt, W1	1760	52.4	0-1	3356	0
Exercise to lose wt, W2	1310	52.0	0-1	2519	0
Trying to lose wt, W1	1588	47.3	0-1	3356	0
Trying to lose wt, W2	1166	46.3	0-1	2519	0

Note: All values are weighted to provide national estimates among high school aged girls, 1994-5. Responses were coded as =1 if marked and =0 if not marked or missing.

Table 7

Descriptive Statistics for Family Variables, Wave 1

Variables	M	α	SD	Range	N	Missing
Family social support	15.93	.784	2.87	4-20	3344	12
Family understands me	3.54		1.03	1-5		
Family pays attention to me	3.89		.952	1-5		
Family has fun together	3.73		1.04	1-5		
Parents care about me	4.78		.595	1-5		
Parent Traditional Gender Attitudes	29.7%			0-1	2916	440

Note: All values are weighted to provide national estimates among high school aged girls, 1994-5.

Assessment of Bivariate Relationships among Variables

Among the main study variables in wave 1, the absence of body image distortion among adolescent girls is associated with high self-esteem (r= -.19, $p < .001$), early adolescent years (r= -.09, $p < .001$) compared to later adolescent years, and African American racial identification (r=-.11, $p < .001$). BID is positively correlated with high appearance investment (r=.06, $p < .01$), parent education at the college degree or more level (r=.04, $p < .05$), and White racial identification (r= .06, $p < .01$) (see Table 8).

Table 8

Correlation Matrix of Wave 1 Study Variables

Variables	1	2	3	4	5	6
1. Body image distortion	–					
2. Self-esteem	-.194***	–				
3. Social passivity	-.013	.169***	–			
4. Appearance investment	.061**	.088***	.000	–		
5. Family social support	-131***	.476***	.167***	.064***	–	
6. Parent traditional att.	-.017	-.013	.075***	-.018	.004	–
7. Early adolescence	-.085***	.042*	.097***	.032	.115***	.026
8. Parent ed =HS or less	-.030	-.32	.085***	-.082***	-.044*	.161***
9. Parent ed= some college	-.006	.005	-.040*	.009	-.011	-.066***
10. Parent ed => college grad	.042*	.032	-.059**	.087***	.063***	-.122***
11. Hispanic	.032	-.037*	.080***	-.019	-.001	.129***
12. African American	.-.112***	.115***	-.004	-.100***	.010	.071***
13. White	.057**	-.044*	-.066***	.085***	-.002	-.182***
14. Asian	.030	-.063***	.015	.004	-.026	.090***
15. Other race/ethnicity	-.011	.004	.032	.028	.010	.032
16. Body mass index	-.005	-.090***	-.027	-.251***	-.069***	.041*

Table 8

Continued

Variables	7	8	9	10	11	12	13	14	15
1. Body image distortion									
2. Self-esteem									
3. Social passivity									
4. Appearance investment									
5. Family social support									
6. Parent traditional attitudes									
7. Early adolescence[a]	_	_	_	_					
8. Parent ed =HS or less	-.012	_	_	_	.157***	-.022	-.063***	-.055**	-.004
9. Parent ed= some college	.014	_	_	_	-.047**	.005	.037*	-.028	-.004
10. Parent ed => college grad	-.001	_	_	_	-.130***	.020	.034	.091***	.008
11. Hispanic	.007	.151***	-.056**	-.120***					
12. African American	-.029	.063***	-.006	-.069***					
13. White	.028	-.135***	.062***	.095***					
14. Asian	-.034*	-.065***	-.036*	.114***					
15. Other race/ethnicity	.014	.006	-.028	.022					
16. Body mass index	-.140***	.065***	.012	-.085***	.021	.132***	-.109***	-.061**	.011

Note: Parent traditional attitudes is taken from the Parent Survey; parent education is taken from both the Parent Survey and Student Survey; all other Wave 1 variables are taken from the Student Survey. Pairwise deletion is used on items with missing data in order to obtain the maximum sample size for each correlation. [a]Early adolescence (12-15 y.o.) vs. later adolescence (16-21) y.o.

*$p < .05$. **$p < .01$. ***$p < .001$ (2-tailed).

Correlations among study and control variables in wave 1 and the weight loss behavioral outcomes in wave 2 (i.e., risky weight loss and dieting to lose weight) are shown in Table 9. Correlations for exercising to lose weight and trying to lose weight are also included for comparison purposes, discussed later in Chapter 5. Exercising is an important comparison variable to "risky weight loss" and "dieting to lose weight" because it is considered a healthy approach to weight loss. , As shown in Table 9, the presence of body image distortion at wave 1 is highly correlated with dieting to lose weight (r= .18, p<.000), engaging in risky weight loss behaviors (vomiting, laxatives or diet pills) (r= .085, p<.000), and trying to lose weight (r= .250,p<.000) one year later at wave 2.

Similarly, low self-esteem is highly correlated with dieting to lose weight, risky weight loss behaviors, and trying to lose weight (r= -.112, -.073, -.139, respectively, p<.000). Body image distortion is also positively correlated with exercising to lose weight (r= .048, p < .05), though not strongly; and self-esteem is unrelated to exercising to lose weight. High family social support is strongly correlated with decreased risky weight loss behaviors (r= -.105, p<.000); with decreased trying to lose weight, and with increased exercising to lose weight. Family social support is unrelated to dieting behavior; and parental traditional attitudes are unrelated to any of the weight loss behaviors assessed.

Finally, as shown in Table 9, all weight loss behaviors at wave 1 are positively correlated with each and every other weight loss behavior at wave 2 with a single exception. Risky weight loss behavior at wave 1 is unrelated to exercising at wave

2. The finding of strong associations between weight loss behavior at wave 1 and 2 supports the decision to use wave 1 weight loss variables as controls in the multivariate analyses that follow, in order to clarify temporal order and assess actual change in weight loss behavior (i.e., onset) between waves 1 and 2.

Table 9

Correlations between Wave 1 and Wave 2 Variables (N=2519)

Variables at wave 1	Risky weight loss behavior W2	Dieting to lose weight at W2	Exercising to lose weight W2	Trying to lose weight W2
Body image distortion	.085***	.180***	.048*	.250***
Self-esteem	-.073***	-.112***	.020	-.139***
Social passivity	-.014	-.014	-.006	-.040*
Appearance investment	-.032	-.028	.004	-.108***
Family social support	-.105***	-.029	.056*	-.044*
Parent traditional attitudes	.007	-.004	-.023	.033
Early adolescence (12-15)	-.032	-.064**	.081***	-.031
Parent ed =HS or less	.020	-.035	-.101***	.010
Parent ed= some college	-.012	-.021	.043	.011
Parent ed => college degree	-.011	.063**	.074**	-.023
Hispanic	-.020	.001	-.011	.008
African American	-.013	-.066**	-.074**	-.022
White	.023	.052*	.066**	.021
Asian	.009	.022	-.006	-.013
Risky wt loss W1	.060**	.069**	.004	.077***
Dieting to lose wt W1	.089***	.314***	.087***	.251***
Exercising to lose wt W1	.048*	.106***	.268***	.173***
Trying to lose wt W1	.112***	.345***	.181***	.572***
Body mass index W1	.096***	.223***	.065**	.411***

Note: Pairwise deletion used on variables with missing observations.

*$p < .05$. **$p < .01$. ***$p < .001$ (2-tailed)

Complex Survey Design Considerations

All data screening, variable preparation, and correlation analyses were conducted using SPSS version 14.0. However, the prepared data set was then transferred to STATA with Stat Transfer to perform all multivariate analyses in order to obtain valid results. By entering the probability sampling unit (PSU) variable and cluster variable provided by the Add Health research team, STATA is able to account for the complex survey design of Add Health and estimate more conservative standard errors accordingly. Multivariate analyses consisted of logistical regression when the dependent variables of interest were dichotomous, multiple regression when the dependent variables of interest were continuous, analysis of an intervening variable (mediator effect) and analyses of an interaction (moderator effects). Control variables were entered into each regression model. Analytic strategies for testing specific hypotheses are summarized in Table 10, followed by detailed descriptions.

Table 10

Summary of Hypotheses and Analytic Strategies

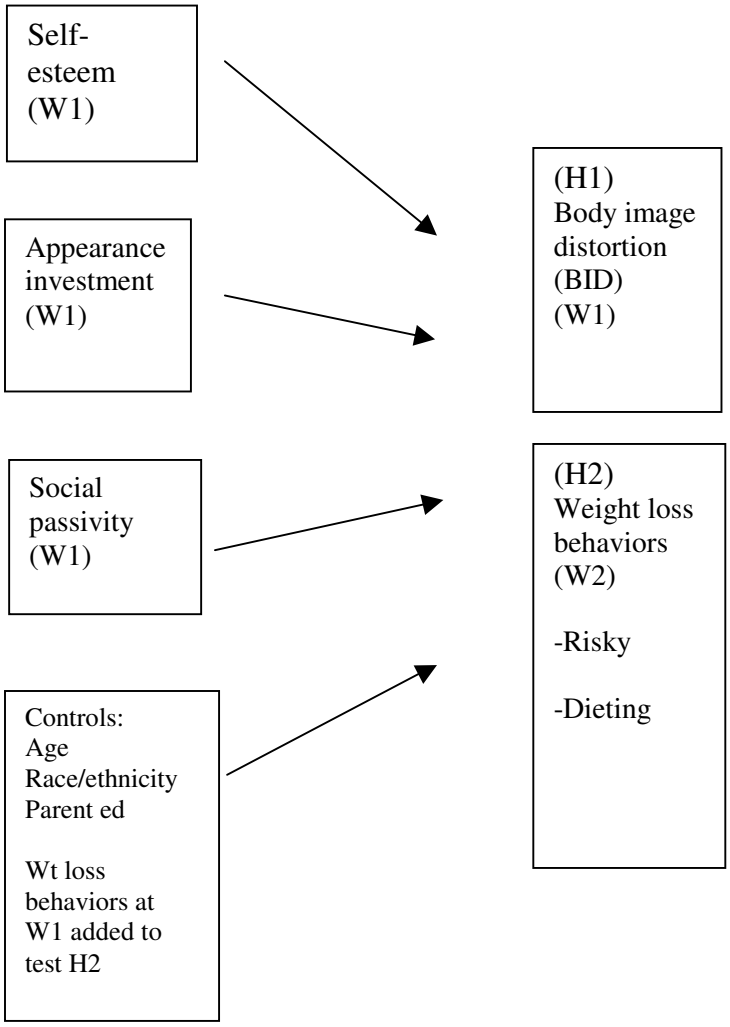
Hypothesis	*Analytic Strategy*
1a) Higher self-esteem will be associated with decreased likelihood of body image distortion. 1b) Higher appearance investment will be associated with increased likelihood of body image distortion. 1c) Higher social passivity will be associated with increased likelihood of body image distortion.	1) Logistic regression predicting body image distortion (BID) at wave 1 from self-concept variables (self-esteem, appearance investment, social passivity) at wave 1, controlling for background factors.
2a) Higher self-esteem will predict decreased likelihood of using risky methods to lose weight. 2b) Higher appearance investment will predict greater likelihood of using risky methods to lose weight. 2c) Higher social passivity will predict greater likelihood of using risky methods to lose weight.	2a-c) Logistic regression predicting risky weight loss behavior at wave 2 from self-concept variables (self-esteem, appearance investment, social passivity) at wave 1, controlling for background factors and risky weight loss behavior at wave 1.
2d) Higher self-esteem will predict decreased likelihood of dieting to lose weight. 2e) Higher appearance investment will predict greater likelihood of dieting to lose weight. 2f) Higher social passivity will predict greater likelihood of dieting to lose weight.	2d-f) Logistic regression predicting dieting to lose weight behavior at wave 2 from self-concept variables (self-esteem, appearance investment, social passivity) at wave 1, controlling for background factors and dieting behavior at wave 1.
3a) Body image distortion at time 1 will predict greater likelihood of using risky weight control methods at w2. 3b) Body image distortion at time 1 will predict greater likelihood of dieting to lose weight at w2.	3) Two logistic regressions predicting two types of weight loss behavior at wave 2 from BID at wave 1, controlling for background factors, self-concept, and respective weight loss behavior at wave 1.
4a) Body image distortion will mediate the relationships between significant self-concept predictors (e.g., social passivity, appearance investment, self-esteem) and use of risky weight loss methods. 4b) Body image distortion will mediate the relationships between significant self-concept predictors and dieting to lose weight.	4) Observe changes in coefficients and significance levels before and after BID is added to the models (i.e., changes in coefficients for social passivity, appearance investment and self-esteem between models 2 and model 3).
5a) Greater family social support will predict decreased likelihood of risky weight loss behaviors among girls. 5b) Greater family social support will moderate (weaken) the predictive relationship of body image distortion on risky weight loss behavior.	5) Logistic regression predicting risky weight loss behavior from family social support (FSS) and from the interaction of FSS*BID, controlling for background factors, self-concept, and risky weight loss behavior at wave 1.
6a) Greater traditional gender role attitudes of parents will be associated with higher appearance investment. 6b) Greater traditional gender role attitudes of parents will be associated with higher social passivity.	6a) Two multivariate regressions predicting appearance investment and social passivity, respectively, at wave 1 from parent traditional gender attitudes at wave 1.

Hypotheses 1 and 2: Predicting body image distortion and weight loss behaviors from gendered self-concept.

Hypotheses 1 and 2 were assessed using logistic regression to predict body image distortion from three gendered self-concept variables (self-esteem, appearance investment and social passivity), controlling for age, race/ethnicity, and parent education. All variables for testing hypothesis 1 were from wave 1.

Hypotheses 2 was assessed using two logistic regressions to predict the change, since wave 1, in each weight loss behavior at wave 2 (i.e., risky weight loss behavior and dieting) from the same three gendered self-concept variables listed above. This model included a control for the weight loss behavior at wave 1 as well as for age, race/ethnicity, and parent education (see Figure 1).

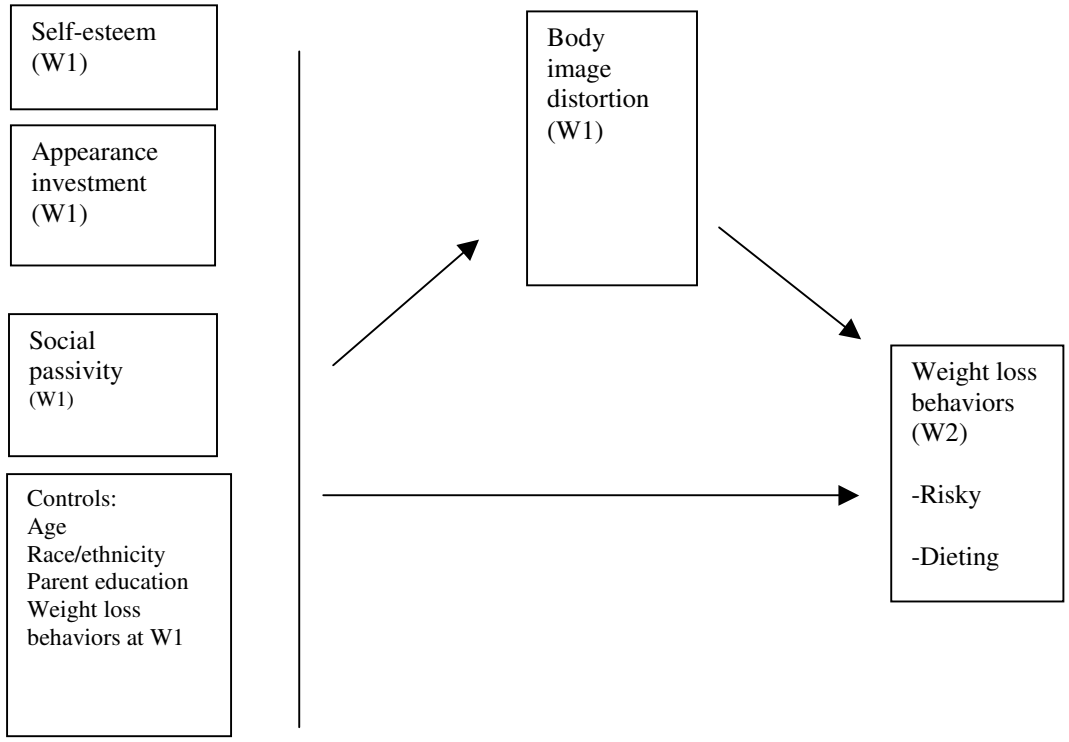
Figure 1. Hypotheses 1 and 2: Gendered self-concept.



Hypotheses 3 and 4: Predicting Weight Loss Behavior from BID and BID Mediation.

Logistic regression was used to evaluate the hypotheses that body image distortion at wave 1 predicts each type of binary coded weight loss behavior at wave 2, controlling for baseline weight loss behaviors. Race/ethnicity, age, and parent education were also entered as controls throughout. The strategy to test hypotheses 4a and 4b was to regress each weight loss variable onto the independent variables (i.e., self-esteem, appearance investment, social passivity, and controls) and enter body image distortion as a mediator last (Preacher & Hayes, 2004). This assessed the degree to which BID operates as a mechanism through which girls' self-esteem, appearance investment, and social passivity operate to influence girls' odds of each type of weight loss behavior. For mediation, we expected to see the strength of the relationships between the self-concept factors and weight loss behaviors to decrease to non-significant levels when body image was added to the model. Body image would be considered a "perfect" mediator if the association between individual factors and weight control drops to zero once body image is added to the model (Preacher & Hayes, 2004). If there is no change in the strength of the relationships between individual variables and weight control when BID is added to the model, then the data would not support a mediation explanation. See Figure 2.

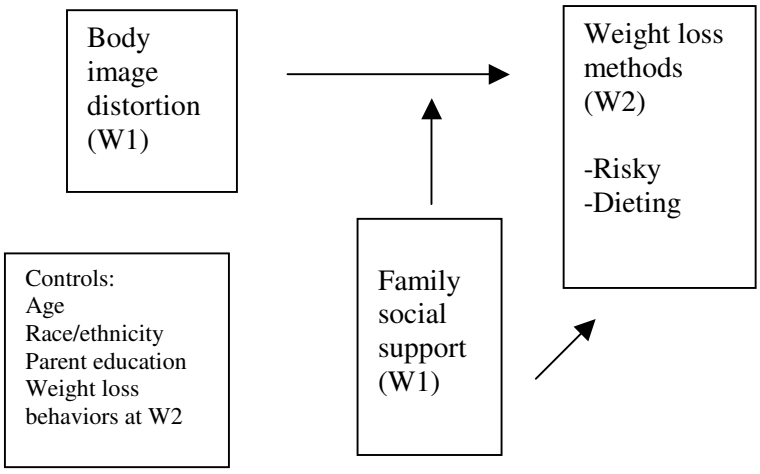
Figure 2. Hypotheses 3 and 4: BID as predictor and mediator.



Hypothesis 5: Family social support and moderation effects.

Logistic regression was used to test hypotheses 5a and 5b. This model tested family social support (FSS) as a predictor and it was expected that FSS would decrease the odds of a girl reporting risky weight loss behavior. Family social support was also tested as a moderator of the relationship between BID and risky weight loss behavior by adding a FSS*BID interaction term to the model. Moderator variables are variables that specify conditions (e.g., SES, social support), that affect the direction and/or strength of a causal chain or correlation between an IV and a DV (Baron & Kenny, 1986). Standard procedures were followed: the outcome variable was regressed first on the controls, then the main predictor variable (BID), the moderator variable (FSS), and finally predictor X the moderator of interest (thus controlling for all other IVs). It was expected that the degree of family social support would buffer the effect of body image distortion on risky weight loss behaviors. See Figure 3.

Figure 3. Hypothesis 5: Family social support and moderation effects.



Hypotheses 6: Parent Gender Attitudes

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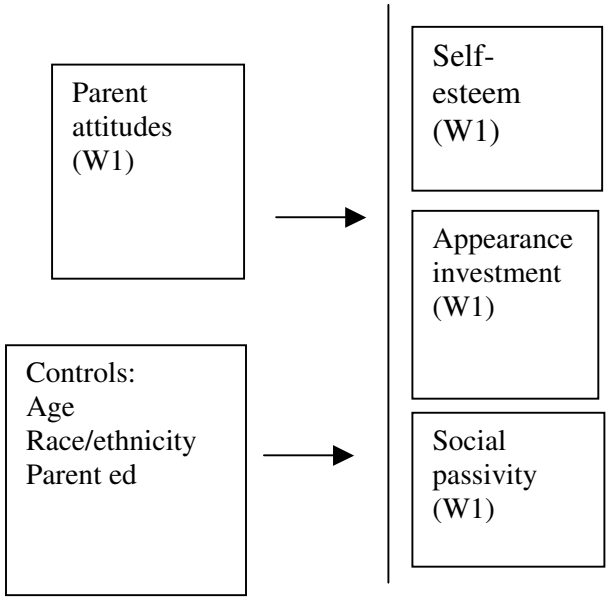
Linear ordinary least squares regression was used to test the three hypotheses that parent traditional gender attitudes would be associated with a girl's level of gendered self-concept (i.e., self-esteem, appearance investment, social passivity). Controlling for age, race/ethnicity, parent education, each of the self-concept variables were regressed onto parent attitudes. All measures in this model were taken from wave 1. It was expected that parent traditional attitudes would be associated with each aspect of a girls' gendered self-concept. See Figure 4.

Figure 4. Hypothesis 6: Parent gender attitudes.



Summary of Analytic Plan

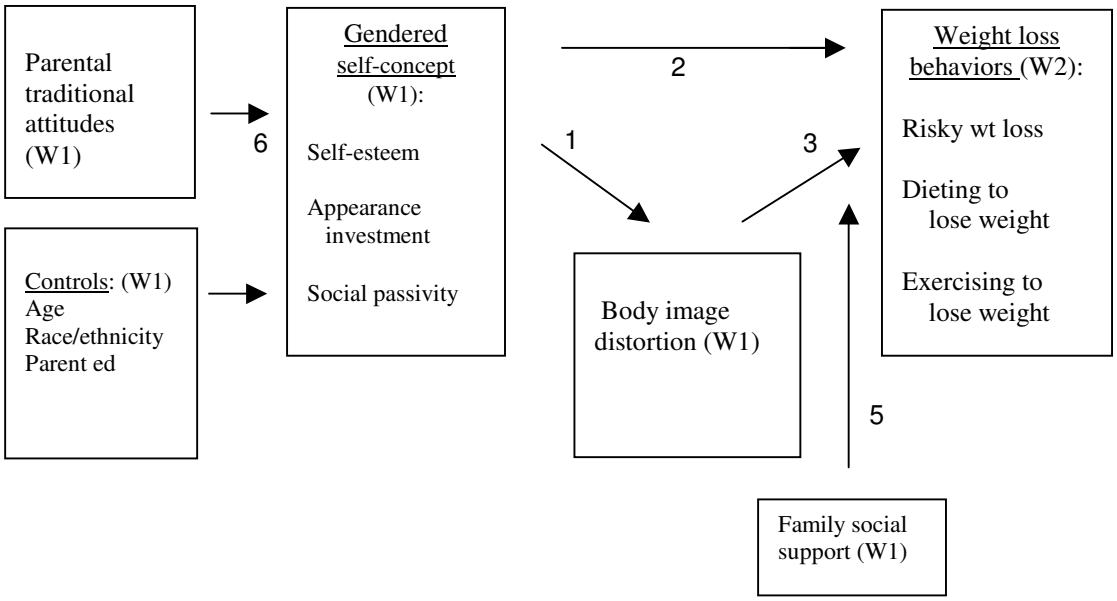
The study was organized by three phases to identify possible pathways of risk and resilience. In the first phase, the dependent variable was body image distortion and the main independent variables were self-esteem, appearance investment and social passivity (three aspects of gendered self-concept). In the second phase, the dependent variables were levels of weight loss behavior; and the main independent variables were aspects of gendered self-concept and body image distortion. Mediation through BID and moderation by family social support were also considered when predicting weight loss behavior. In the third phase the dependent variables were aspects of gendered self-concept and the independent variable was parent traditional gender attitudes. Control variables for race/ethnicity, age, and parent education were employed throughout the study.

Linear ordinary least squares regression was used with the continuous dependent variables in research question 6. All other analyses conducted in this study were based on logistic regression, since the remaining dependent variables were dichotomous (research questions 1-5). Unstandardized coefficients (B) and odds ratios are computed for each predictor in the logistic regressions. Odds ratio is the standard measure of effect size for logistic regression, ranging from 0 to infinity. An odds ratio [=exp(B)] is interpreted when the coefficient is statistically significant. When the predictor is binary, the odds ratio is interpreted as the odds in favor of an outcome when a predictor is present (=1) vs. when it is absent (=0). For continuous predictors, the odds ratio is interpreted as a percent increase or decrease in odds of the outcome for every 1 unit increase in the predictor (odds ratio minus 1 * 100). Thus an odds ratio of less than one indicates lower odds of an outcome occurring, and an odds ratio of greater than one indicates greater

odds of an outcome occurring, relative to the reference category (Tabachnick & Fidell, 2001; Pedhazur, 1997).

The conceptual diagram in Figure 5 summarizes the relationships that are examined in this study. The numbers represent the hypotheses relevant to each relationship and correspond to the summary of analytic strategies outlined in Table 10. Results are reported in the following chapter.

Figure 5. Conceptual diagram.



Chapter 4: Results

This chapter presents results of multivariate analyses to answer the six research questions outlined above. Each proposed hypothesis is evaluated, and a summary of all results is found at the end of this chapter in Table 18. Together the six research questions aim to find out the degree to which gendered self-concept and family factors influence the development of disordered body image and eating among adolescent girls. Models 1 and 2 test gendered self-concept as a predictor of body image distortion (BID) and weight loss behaviors, respectively. Model 3 tests whether BID predicts weight loss behaviors; and model 4 examines BID as a mechanism (mediator) between self-concept and weight loss behavior. Models 5 and 6 examine the protective effect of family social support on outcomes, and the role of parent traditional attitudes as predictors of a gendered self-concept, respectively.

Predicting Body Image Distortion from Gendered Self-concept (Question 1)

Is a gendered self-concept (i.e., social passivity, appearance investment, low self-esteem) associated with body image distortion among girls? Contrary to one of the hypotheses, social passivity is not related to body image distortion, as suggested by the logistic regression results presented in Table 11. However, the data do support the second two hypotheses that lower self-esteem and higher appearance investment are significantly associated with the presence of body image distortion. Girls with a high level of appearance investment have 13% greater odds of displaying body image distortion for every unit of increase on the appearance investment scale (range 2-10, B= .12, $p<.01$). Girls with high self-esteem have 12% decrease in odds of displaying body

image distortion for every unit decrease on the self-esteem scale (range 6-30, B= -.13, $p<.001$).

In addition, young age (12-15 years vs. 16-21) and African American race/ethnic identification are associated with the a lower chance of body image distortion; African American girls are half as likely as White girls to display body image distortion (exp(B)= .50, B = -.69, $p<.001$). Young girls ages 12-15 are 37% less likely to display body image distortion than older girls ages 16-21 (exp(B)= .63, B = -.46, $p<.001$). Though parent education was strongly associated with BID before correcting for the clustered survey design in STATA, the effect of parent education is reduced to the trend level in this corrected model: girls whose parents are highly educated (i.e., college degree or beyond) are more likely to display body image distortion than girls with parents who completed high school or less (exp(B)= 1.3, B = .27, $p=.05$).

Thus, in this multivariate model predicting BID, high self-esteem and African American race/ethnic identification function as a protective factors against body image distortion, while older age and high appearance investment function as risk factors for BID. At the trend level, high parent education (college degree or beyond) may also function as a risk factor for BID. As measured here, social passivity has no relationship to BID.

However, although social passivity does not have a direct effect on BID, does it have a direct effect on risky weight loss behavior or dieting outcomes? Similarly, although low self-esteem and high appearance investment predict cognitive body image distortion, do they also have direct effects on risky weight loss and dieting to lose weight

behavior outcomes (research question 3)? These questions are addressed below under research question 2.

Table 11

Logistic Regression Analysis Predicting Body Image Distortion Among Girls from Background Factors and Self-concept at Wave 1 (n=3151)

	Body image distortion at W1 (girls who overestimate their weight status compared to BMI classification)					
	Model 1			Model 2		
Variable	B	*SE B*	e^B	B	*SE B*	e^B
Hispanic	.091	.144	1.10	.061	.149	1.062
African American	-.851***	.145	**.427**	-.694***	.147	**.500**
Asian	.182	.304	1.20	.020	.296	1.020
Other	-.342	.412	.711	-.363	.401	.700
Early Adolescence	-.446***	.108	**.640**	-.462***	.110	**.630**
Parent ed some college	.059	.120	1.060	.091	.125	1.095
Parent ed college grad	.220	.130	1.246	.272	.137	1.313
Self-esteem				-.128***	.013	**.879**
Appearance invest				.123**	.042	**1.131**
Social passivity				.042	.034	1.043
Constant	.996	.094		-.916	.456	
N=	3151			3151		
Design F =	F (7, 124) = 8.31			F (10, 121) = 15.19		
Prob> F =	.000			.000		

Note: B=unstandardized coefficient, *SE B*=standard error of coefficient, $e^{B=}$ =odds ratio. Reference categories are White race/ethnicity, later adolescence (16-21 y.o.), and parent ed HS or less. Analysis was performed with STATA statistical software to account for the complex survey design of Add Health. Body image distortion is operationalized as girls who overestimate their weight status compared to their BMI classification based on height, weight and age.

*$p < .05$. **$p < .01$. ***$p < .001$.

Predicting Weight Loss Behavior from Gendered Self-concept (Question 2)

Does a gendered self-concept at wave 1 predict the onset of weight loss behavior a year later? As shown in Table 12, low self-esteem predicts both risky weight loss behavior and dieting to lose weight at wave 2, even after controlling for these behaviors at wave 1. Girls have a 10% decrease in odds of risky weight loss behavior (*exp*(B)= .90, $p<.05$) and a 5% decrease in odds of dieting to lose weight (*exp*(B)= .95, $p=.01$) for every unit increase they report on the self-esteem scale with a range of 6-30. However, social passivity and appearance investment are unrelated to the use of risky weight loss methods or dieting to lose weight a year later. These data lend support for two of the six hypotheses posed under research question 2 (see Table 18 for a summary of all results).

Results from questions 1 and 2 thus far suggest that in multivariate models controlling for other factors, including a control for wave 1 risk behavior, only self-esteem at wave 1 has a direct effect on both risky weight loss and dieting to lose weight one year later. Low self-esteem and high appearance investment are associated with greater likelihood of BID, leading to the next major question: does BID matter? Is BID a potential risk factor in the development of disordered eating? Does BID have a direct effect on risky weight loss behavior and on dieting to lose weight? These questions are specified and answered below.

Table 12

Logistic Regression Predicting Change in Weight Loss Behaviors at W2 from Self-concept at W1

	Predict Risky Weight Loss Behavior			Predict Dieting to Lose Weight Behavior		
Predictor variable	B	SE B	e^B	B	SE B	e^B
Hispanic	-.568	.518	.567	-.105	.221	.900
African American	-.366	.515	.693	-.415*	.188	**.660**
Asian	.176	.773	1.192	.026	.319	1.027
Other	-.289	.960	.749	-1.670**	.593	.183
Early Adolescence	-.308	.271	.735	-.181	.123	.834
Parent ed some college	-.282	.344	.755	-.027	.161	.973
Parent ed college grad	-.331	.362	.718	.239	.135	1.269
Self-esteem	-.104*	.046	**.902**	-.051**	.015	**.950**
Appearance invest	-.138	.117	.871	-.019	.042	.981
Social passivity	-.010	.083	.990	.033	.040	1.033
Risky wt loss at W1	1.259	.716	3.521			
Dieting to lose wt at W1				1.651***	.133	**5.230**
Constant	-.246	1.162		.354	.518	
	N= 2370 F (11, 120) = 1.99 Prob>F= .035			N= 2370 F (11, 120) = 17.02 Prob>F= .000		
	% girls reporting risky weight loss behavior at W2 = 2.7%			*% girls reporting dieting to lose weight at W2 = 28.4%*		

Note: Analysis was performed with STATA statistical software using svyset commands in order to adjust the standard errors to account for the clustered sampling survey design of Add Health. The e^B = exponentiated B can be interpreted as odds ratios. Older adolescent age, parent education of HS or less, and White race/ethnicity were omitted as reference categories.
*$p < .05$. **$p < .01$. ***$p < .001$.

Predicting Weight Loss Behavior from Body Image Distortion (Question 3)

Does body image distortion predict the onset of weight loss behavior one year later? Body image distortion is a strong predictor of an increase in both risky weight loss behavior and in dieting to lose weight from wave 1 to wave 2 (see Table 13). Specifically, compared to girls without BID, girls with BID at wave 1 are 140% more likely to begin to engage in risky weight loss behavior within a year (*exp*(B)= 2.4, *p*=.01) and 100% more likely to begin dieting to lose weight within a year (*exp*(B)= 2.00, *p*=.001). Both hypotheses are supported.

Combined results suggest that body image distortion at wave 1 does have a direct effects on risky weight loss behavior and on dieting to lose weight at wave 2; however, does BID function in another way in the potential development of disordered eating? Does BID mediate the effects of a gendered self-concept (i.e., low self-esteem and high appearance investment) on weight loss behavior? Do low self-esteem and high appearance investment have only direct effects on weight loss behavior, as previously reported, or do they also have indirect effects through BID? Specifically, is BID a mechanism of risk for disordered weight loss behavior and dieting to lose weight? These questions are addressed below under question 4.

Table 13

Logistic Regression Predicting Change in Weight Loss Behaviors at W2 from Body Image Distortion at W1

	Predict Risky Weight Loss Behavior			Predict Dieting to Lose Weight Behavior		
Predictor variable	B	SE B	e^B	B	SE B	e^B
Hispanic	-.573	.517	.564	-.102	.218	.903
African American	-.265	.512	.767	-.341	.185	.711
Asian	.201	.769	1.223	.042	.314	1.043
Other	-.280	.888	.756	-1.603**	.590	.201
Early Adolescence	-.242	.270	.785	-.130	.124	.878
Parent ed some college	-.275	.342	.759	-.013	.163	.987
Parent ed college grad	-.364	.362	.695	.228	.134	1.257
Self-esteem	-.080	.049	.923	-.036*	.015	**.965**
Appearance invest	-.168	.119	.846	-.041	.043	.960
Social passivity	-.026	.084	.974	.022	.040	1.022
Risky wt loss at W1	.896	.717	2.45			
Dieting to lose wt at W1				1.533***	.138	**4.633**
Body image distortion	.862**	.313	**2.368**	.693***	.137	**2.00**
Constant	.319	1.23		.708	.511	
N= 2370 F (12, 119) = 2.73 Prob>F= .003				N= 2370 F (12, 119) = 16.12 Prob>F= .000		
% girls reporting risky weight loss behavior at W2 = 2.7%				*% girls reporting dieting to lose weight at W2 = 28.4%*		

Note: Analysis was performed with STATA statistical software using svyset commands in order to adjust the standard errors to account for the clustered sampling survey design of Add Health. The e^B = exponentiated B can be interpreted as odds ratios. Older adolescent age, parent education of HS or less, and White race/ethnicity were omitted as reference categories.

*$p < .05$. **$p < .01$. ***$p < .001$.

Testing Body Image Distortion as a Mediator of Risk (Question 4)

Does body image distortion mediate the relationship between self-concept and weight loss behavior? Body image distortion appears to partially mediate the relationship between low self-esteem and risky weight loss behavior. The three conditions for testing mediation are met (Baron & Kenny, 1986): first, self-esteem predicts risky weight loss and dieting; second, self-esteem predicts BID; and third, BID predicts risky weight loss and dieting. If mediation is occurring, the strength of the association between self-esteem and weight loss behavior will decrease (preferably to non-significance) when BID is added to the model.

BID mediation between self-concept and risky weight loss.

As shown in Table 14, self-esteem was a significant predictor before adding BID to the model (B = -.104, $p<.05$) but the coefficient declined in size and it was no longer significant after adding BID to the model (B = -.08, $p=.1$) , suggesting mediation effects. Self-esteem has no direct effect on risky weight loss once BID is included. Therefore, self-esteem has an indirect effect, mediated through BID, but no direct effect. Hypothesis 4a is supported.

Table 14

Logistic Regression Assessing BID as a Mediator between Self-concept and Risky Weight Loss Behavior

	Risky weight loss behaviors at W2 (diet pills, vomiting, or laxatives)								
	Model 1			Model 2			Model 3		
Variable	B	*SE B*	e^B	B	*SE B*	e^B	B	*SE B*	e^B
Hispanic	-.546	.508	.579	-.568	.518	.567	-.573	.517	.564
African American	-.363	.512	.695	-.366	.515	.693	-.265	.512	.767
Asian	.168	.764	1.18	.176	.773	1.192	.201	.769	1.223
Other	-.334	.955	.716	-.289	.960	.749	-.280	.888	.756
Early Adolescence	-.330	.265	.719	-.308	.271	.735	-.242	.270	.785
Parent ed some college	-.268	.350	.765	-.282	.344	.755	-.275	.342	.759
Parent ed college grad	-.336	.360	.715	-.331	.362	.718	-.364	.362	.695
Self-esteem	-.110*	.046	**.896**	-.104*	.046	**.902**	-.080	.049	.923
Appearance invest	-.131	.120	.878	-.138	.117	.871	-.168	.119	.846
Social passivity	-.012	.081	.989	-.010	.083	.990	-.026	.084	.974
Risky wt loss at W1				1.259	.716	3.521	.896	.717	2.45
Body image distortion							.862**	.313	**2.368**
Constant	-.389	.111		-.246	1.162		.319	1.23	
N=	2370			2370			2370		
Design F =	F (10, 121) = 1.55			F (11, 120) = 1.99			F (12, 119) = 2.73		
Prob> F =	.130			.035			.003		

Note: B=unstandardized coefficients, *SE B*=standard error of coefficient, $e^{B=}$ =odds ratio. Reference categories are White race/ethnicity, later adolescence (16-21 y.o.), and parent ed HS or less.

*$p < .05$ **$p < .01$ ***$p < .001$

BID mediation between self-concept and dieting to lose weight.

BID also partially mediates the relationship between low self-esteem and dieting to lose weight, as depicted in Table 15. There is a decrease in significance and a 20% decrease in the strength of the coefficient after adding BID to the model. However, self-esteem remains a significant predictor before (B = -.05, $p<.01$) and after adding BID to the model (B = -.04, $p<.05$), so this is partial mediation. Self-esteem has a strong direct effect on dieting to lose weight and a weak indirect effect on dieting through BID. The other two self-concept variables (i.e., social passivity and appearance investment) do not meet the conditions for testing mediation (Baron & Kenny, 1986). Hypothesis 4b is partially supported.

Additional findings.

Although exercising to lose weight is not included in the hypotheses of this study since it is considered a benign approach for adolescents to lose weight, it is useful as a comparison. Analyses parallel to those conducted above (for research questions 2-4) with exercising to lose weight as the dependent variable were also conducted. Results are found in Appendix B, and will be mentioned in the discussion chapter to follow.

Table 15

Logistic Regression Assessing BID as a Mediator between Self-concept and Diet to Lose Weight Behavior

	Dieting to Lose Weight at W2								
	Model 1			Model 2			Model 3		
Variable	B	*SE B*	e^B	B	*SE B*	e^B	B	*SE B*	e^B
Hispanic	-.109	.207	.897	-.105	.221	.900	-.102	.218	.903
African American	-.443*	.176	**.642**	-.415*	.188	**.660**	-.341	.185	.711
Asian	-.024	.293	.976	.026	.319	1.027	.042	.314	1.043
Other	-1.379*	.598	.252	-1.670**	.593	.183	-1.603**	.590	.201
Early Adolescence	-.239*	.119	**.788**	-.181	.123	.834	-.130	.124	.878
Parent ed some college	.048	.154	1.050	-.027	.161	.973	-.013	.163	.987
Parent ed college grad	.327*	.133	**1.387**	.239	.135	1.269	.228	.134	1.257
Self-esteem	-.067***	.014	**.935**	-.051**	.015	**.950**	-.036*	.015	**.965**
Appearance invest	-.041	.039	.959	-.019	.042	.981	-.041	.043	.960
Social passivity	.031	.036	1.031	.033	.040	1.033	.022	.040	1.022
Diet to lose wt at W1				1.651***	.133	**5.230**	1.533***	.138	**4.633**
Body image distortion						.	.693***	.137	**2.00**
Constant	-.612	.422		.354	.518		.708	.511	
N=	2370			2370			2370		
Design F =	F (10, 121) = 4.44			F (11, 120) = 17.02			F (12, 119) = 16.12		
Prob> F =	.000			.000			..000		

Note: B=coefficients, *SE B*=standard error of coefficient, $e^{B=}$ =odds ratio. Reference categories are White race/ethnicity, later adolescence (16-21 y.o.), and parent ed HS or less.

*$p < .05$ **$p < .01$ ***$p < .001$

Summary of findings: Research question 4.

The findings under question 4 lend support for each of the two BID mediation hypotheses. These and other findings are summarized in Table 18. Findings also provide additional evidence of BID mediation effects between early and later dieting behavior among adolescent girls.

Overall, results thus far clarify the important role of self-esteem and body image distortion in the development of disordered eating indicators. Self-esteem is a strong predictor of BID, and a predictor of the onset of both risky weight loss and dieting to lose weight from one year to another. Self-esteem has both direct effects on weight loss and indirect effects through BID. Though not hypothesized, a noteworthy comparison is that low self-esteem does not predict exercising to lose weight (see Appendix B). However, body image distortion is the strongest of all predictors examined here for all categories of weight loss behavior examined. BID has strong, direct effects on risky weight loss, dieting, and exercising. BID also mediates the effect of self-esteem on risky weight loss.

Findings thus far beg the question: if BID is so influential, is it malleable? Can the effects of BID be attenuated by positive environmental factors? Can strong family social support decrease the odds of risky weight loss behavior one year later? Additionally, could high family social support moderate the vulnerability toward risky weight loss behavior girls with BID display? These questions are explored and answered below under research question 5.

Testing Family Social Support as a Predictor and Moderator of Risk (Question 5)

Does family social support decrease girls' risky weight loss behavior? Does family social support buffer (moderate) the risk of body image distortion on weight loss behavior? Results suggest yes to the first question and no to the second one.

Predicting Risky Weight Loss from Family Social Support (FSS).

Findings in Table 16 suggest that family social support is a strong predictor of decreased likelihood of risky weight loss behavior (B = -18, p=.01). A girl is 16% less likely to engage in risky weight loss behavior for every one unit increase reported on the family social support scale (range 4-20, *exp*(B)= .84, p=.01). Hypothesis 5a is supported.

*Predicting Risky Weight Loss from the Interaction of BID*FSS.*

Results in Table 16 provide no evidence of any interaction effect between body image distortion and family social support (BID*FSS) on risky weight loss behavior (B= -.05, p=.60). Both family social support and body image distortion have direct effects on risky weight loss, but the increased risk of girls with BID for engaging in risky weight loss behaviors at wave 2 is not buffered or moderated by family social support. Hypothesis 5b is not supported (see Table 18 for summary of all results).

These findings beg further exploration about the potential role of the family in moderating and preventing disordered eating and body image distortion. The final research question asks whether parent attitudes influence a girl's self-concept in a way that might begin a trajectory of risk or resiliency early in a girl's life. Do parent traditional or non-traditional gender role attitudes influence a girl's self-concept in ways

that are associated with increased or decreased risk for BID and risky weight loss? This final question is explored and answered under research question 6 below.

Table 16

*Logistic Regression Predicting Risky Weight Loss Behavior from Family Social Support and BID*FSS Interaction*

	Risky weight loss behaviors at W2 (diet pills, vomiting, or laxatives)					
	Model 1			Model 2		
Variable	B	*SE B*	e^B	B	*SE B*	e^B
Hispanic	-477	.516	.620	-.471	.517	.624
African American	-.369	.546	.691	-.386	.547	.680
Asian	.310	.787	1.363	.333	.791	1.395
Other	-.188	.881	.829	-.191	.881	.826
Early Adolescence	-.170	.271	.843	-.164	.272	.849
Parent ed some college	-.269	.342	.764	-.278	.349	.757
Parent ed college grad	-.282	.364	.762	-.279	.366	.756
Self-esteem	-.009	.052	.991	-.010	.053	.990
Appearance invest	-.147	.117	.863	-.144	.120	.866
Social passivity	.004	.087	1.004	.002	.089	1.00
Risky wt loss at W1	.824	.684	2.280	.849	.673	2.34
Body image distortion (BID)	.829**	.304	**2.290**	1.554	1.423	4.731
Family social support (FSS)	-.180**	.055	**.835**	-.1559*	.068	**.856**
BID*FSS				-.051	.098	.950
Constant	-.404	1.173		-.078	1.418	
N=	2370			2370		
Design F =	F (13, 118) = 3.71			F (14, 117) = 3.96		
Prob> F =	.000			.000		

Note: B=coefficients, *SE B*=standard error of coefficient, $e^{B=}$ =odds ratio. Reference categories are White race/ethnicity, later adolescence (16-21 y.o.), and parent ed HS or less.

*$p < .05$ **$p < .01$ ***$p < .001$

Predicting Girls' Gendered Self-concept from Parent Attitudes (Question 6)

Are parental traditional gender role attitudes associated with gendered self-concept among their daughters? Three linear regressions predicting social passivity, appearance investment, and self-esteem from parent attitudes and controls are presented in Table 17. As hypothesized, parent traditional gender role attitudes significantly predict social passivity (B= .08, $p<.05$). However, there is no evidence of any relationship between parent traditional attitudes and appearance investment among girls. One of the two hypotheses is supported. Furthermore, parental gender role attitudes as measured here suggest no relationship to self-esteem.

Findings presented in this chapter are discussed below in chapter 5. As a basis for this discussion, Table 18 summarizes the six research questions, tests of hypotheses, and results of the study.

Table 17

Three Linear Regression Analyses Predicting Girls' Gendered Self-concept from Parent Traditional Attitudes and Background Variables in Wave 1 (N=2751)

	Dependent variable								
	Self-esteem			Appearance investment			Social passivity		
Predictor	*B*	*SE B*	*p*=	*B*	*SE B*	*p*=	*B*	*SE B*	*p*=
Hispanic	-.289	.337	.394	-.168	.091	.070	.293*	.143	.042
African American	1.274***	.192	.000	-.376***	.089	.000	-.040	.093	.666
Asian	-.989	.586	.094	-.147	.254	.564	.002	.209	.992
Other	-.027	.540	.961	.247	.332	.459	.528	.360	.144
Early Adolescence	.065	.158	.682	.010	.074	.894	.304***	.066	.000
Parent ed some college	.106	.166	.525	.153	.079	.055	-.225**	.067	.001
Parent ed college grad	.487**	.178	.007	.314***	.081	.000	-.299***	.081	.000
Self-esteem	---	---	---	.042***	.009	.000	.075***	.009	.000
Appearance invest	.243***	.053	.000	---	---	---	-.013	.023	.563
Social passivity	.397***	.048	.000	-.012	.021	.562	---	---	---
Parent traditional attitudes	-.136	.170	.424	.075	.074	.311	.163*	.080	.044
constant	20.294	.472	.000	6.39***	.245	.000	3.092** *	.282	.000
$R^{2=}$	.059			.027			.056		
F=	F (10, 121) = 16.08			F (10, 121) = 5.13			F (10, 121) = 12.79		
Prob > F =	.000			.000			.000		
N=	2751			2751			2751		

*$p < .05$ **$p < .01$ ***$p < .001$

Table 18

Summary of Results

Hypothesis	***Results***
*1) Is **gendered self-concept** associated with body image distortion among girls?*	
a) Higher self-esteem will be associated with decreased likelihood of body image distortion.	a) Supported. Girls with higher self esteem are 12% less likely to display body image distortion for every unit decrease on the self-esteem scale (range 6-30).
b) Higher appearance investment will be associated with increased likelihood of body image distortion.	b) Supported. As measured in this study, girls with a higher level of appearance investment are 13% more likely to display body image distortion for every unit of increase on the appearance investment scale (range 2-10).
c) Higher social passivity will be associated with increased likelihood of body image distortion.	c) Not supported. As measured in this study, social passivity is unrelated to incidence of body image distortion in girls.
*2) Does **gendered self-concept** at wave 1 predict the onset of weight loss behavior one year later at wave 2, even after controlling for weight loss behavior at wave 1)?*	
a) Higher self-esteem will predict decreased likelihood of using risky methods to lose weight.	a) Supported. High self-esteem predicts decreased likelihood of reporting risky weight loss behavior. Girls are 10% less likely to use risky weight loss methods for every unit increase they report on the self-esteem scale (range 6-30). High self-esteem is highly correlated with decreased risky weight loss in bivariate analysis.
b) Higher appearance investment will predict greater likelihood of using risky methods to lose weight.	b) Not supported. Higher appearance investment is unrelated to risky weight loss behavior at W2.
c) High social passivity will predict greater likelihood of using risky methods to lose weight.	c) Not supported. Social passivity is unrelated to the use of risky weight loss behavior at W2.
d) High self-esteem will predict decreased dieting to lose weight.	d) Supported. Girls with high self-esteem are 5% less likely to report dieting to lose weight for every unit increase on the self-esteem scale (range 6-30). High self-esteem is highly correlated with dieting in bivariate analysis.
e) High appearance investment will predict greater likelihood of dieting to lose weight.	e) Not supported. Appearance investment is unrelated to likelihood of dieting to lose weight at wave 2.

f) High social passivity will predict greater likelihood of dieting to lose weight.	f) Not supported. Social passivity is unrelated to dieting to lose weight at W2.

*3) Does **body image distortion** at wave 1 predict the onset of weight loss behavior one year later at wave 2, even after controlling for weight loss behavior at w1?*

a) Body image distortion at time 1 will predict greater likelihood of using risky weight control methods at wave 2.	a) Supported. Girls with BID at wave 1 are 140% more likely than girls without BID to begin risky weight loss behavior by wave 2, one year later.
b) Body image distortion at time 1 will predict greater likelihood of dieting to lose weight at wave 2.	b) Supported. Girls with BID at wave 1 are twice as likely than girls without BID to begin dieting to lose weight one year later at wave 2.

*4) Does **body image distortion** mediate the relationship between self-concept and weight loss behavior?*

a) Body image distortion will mediate the relationships between significant self-concept predictors (e.g., social passivity, appearance investment, self-esteem) and use of risky weight loss methods.	a) Partially supported. Mediating relationship is partially supported. There is a direct effect between self-esteem and risky weight loss behavior and between BID and risky weight loss behavior. In addition, there is an indirect effect of self-esteem on risky weight loss, through BID. No direct effects are noted for either of the other self-concept variables, so mediation is not tested.
b) Body image distortion will mediate the relationships between significant self-concept predictors and dieting to lose weight.	b) No supported. Mediation relationship is not supported for the dieting outcome for any of the three self-concept variables. Social passivity and appearance investment do not have direct effects on dieting, so mediation is not tested. Self-esteem is a strong predictor of dieting; however the direct effects of self-esteem on dieting to lose weight persist even after BID is added to the model, suggesting minimal indirect effect through BID. .

*5) Does **family social support** moderate the relationship between body image distortion and weight loss behavior?*

a) Greater family social support will predict decreased likelihood of risky weight loss behaviors among girls.	a) Supported. Girls with high family social support (FSS) at wave 1 are 16% less likely to report risky weight loss behavior at wave 2 for every unit increase on the FSS scale (range 4-20).
b) Greater family social support will moderate (weaken) the predictive relationship of body image distortion on risky weight loss behavior.	b) Not supported. There is no evidence of any buffering or moderating effect of family social support on the relationship between BID and risky weight loss behavior. Both FSS and BID have strong direct effects on weight loss behavior but do not interact.

*6) Are **parental traditional gender role attitudes** associated with gendered self-concept among their daughters?*

a) Greater traditional gender role attitudes of parents will be associated with higher appearance investment.	a) Not supported. There is no evidence of any relationship between parent traditional attitudes and appearance investment among girls.
b) Greater the traditional gender role attitudes of parents will be associated with higher social passivity.	b) Supported. There is a significant association between parent traditional attitudes and social passivity. (However, contrary to expectations, social passivity is not a predictor of BID or risky weight loss behavior.)

Chapter 5: Discussion

This chapter presents an integrative summary and interpretation of study findings in relation to the research questions and to the current literature (see Table 18 for an overview of hypotheses testing and results). Implications for policy and practice as well as limitations of the study are noted. Finally, future directions for research are outlined.

Summary and Interpretation of Findings

This study responds to several inter-related questions about girls' gendered self-concept, body image, weight loss practices, and relevant family influences; and it raises questions for further research. The study questions were designed to elucidate the importance of gendered self-concept, body image distortion, and family in a path leading to or averting disordered eating behavior among girls, as discussed below. Findings from each research question are summarized and interpreted below in light of theory and previous research.

The primary emphasis of this discussion chapter is on gendered self-concept and body image: a synthesis of current findings, previous research, theory, and meaning. The rest of the chapter consists of a brief summary and interpretation of findings for each of the remaining hypotheses related to body image distortion, weight loss behaviors, family social support, and parent attitudes.

Summary of Findings Regarding Gendered Self-concept as a Risk Factor

Research question one asks if gendered self-concept (i.e., low self-esteem, high appearance investment, and high social passivity) is associated with body image distortion among girls. Cross-sectional multivariate analyses suggest that low self-esteem

and high appearance investment are positively associated with girls' body image distortion, but social passivity is not.

The second research question asks if gendered self-concept is associated with weight loss behavior among girls. Longitudinal multivariate analyses suggest that low self-esteem (but not appearance investment nor social passivity) at baseline predicts the onset of risky weight loss behaviors a year later. Low self-esteem also predicts the onset of dieting to lose weight a year later, but appearance investment and social passivity do not. As a comparison, none of the gendered self-concept indicators predict girls' report of exercising to lose weight, which is generally considered a benign strategy for weight loss.

Interpretation of Findings Regarding Gendered Self-concept as a Risk Factor

This section will first discuss the findings related to self-esteem and then to the two constructs most closely tied to feminine sex-roles: social passivity and appearance investment. Then findings of the study related to gendered self-concept as a whole are discussed in more detail in relation to the literature and theory.

Self-esteem.

The rationale for conceptualizing self-esteem as an aspect of a gendered self-concept, as made earlier, is the distinct gendered pattern to trends in self-esteem during adolescence. Nationally representative data from the Growth and Health Study were used to assess self-esteem trends over a five year period; no changes in self-esteem were found for boys ages 9-14 or for African American girls, but White girls' self-esteem decreased (Brown et al., 1998). These authors conclude that African American girls' greater and more stable self-esteem and higher satisfaction with their appearance may be due to

different socialization processes from White girls regarding physical appearance and weight. Although arguable, this suggests that African American girls' maintenance of high self-esteem through puberty and adolescence is an indication of healthy resistance to the hegemonic standards of beauty and femininity to which many girls in our society subject themselves. However, since inclusion of self-esteem as an aspect of gendered self-concept is arguable, the discussion also interprets self-esteem findings as a separate individual characteristic.

If one conceptualizes self-esteem as an aspect of gendered self-concept, then this study lends modest but not overwhelming support for the "femininity hypothesis" (Lakkis, Ricciardelli & Williams, 1999), i.e., that a feminine gendered self-concept elevates one's risk for BID and unhealthy weight loss behaviors. Both low self-esteem and high appearance investment were associated with BID; and low self-esteem predicted onset of risky weight loss behaviors between wave 1 and 2, even after controlling for wave 1.

However, if one does not accept low self-esteem as indicative of a feminine gendered pattern in adolescence, then contrary to expectations, there is little support for the femininity hypothesis in this study. High appearance investment was associated with BID but not with weight loss. These weak findings differ from what one would expect to find based on the literature, as discussed in detail below under gendered self-concept.

Social passivity.

Contrary to expectations, social passivity failed to predict body image distortion or weight loss behaviors, although the (non-significant) direction of influence was as expected. To the extent that the measure of social passivity here is a valid indicator of

female sex-role conformity, the lack of association found here contradicts many previous studies detailed below under gendered self-concept.

The first possible explanation for the lack of significant findings is the weakness of the measure, which consisted of only two items. Social passivity originally had three items but the third one was eliminated due to a low alpha coefficient, and the two items that were retained for social passivity were only moderately well correlated. (In defense of the measure, however, social passivity was correlated with parent traditional gender attitudes, as expected.)

A second possible explanation for the unsupported hypothesis related to social passivity as a predictor of body distortion and/or weight loss behavior is that, as measured here, it is possible that social passivity may actually contribute to a girl's overall interpersonal competence, and thus her ability to cope with body image stressors. The items are "You never criticize anyone" and "You never argue with anyone." While these questions have reasonable face validity as indicators of social passivity, it is possible that even assertive and self-assured adolescent girls may be reluctant to criticize or argue directly with others in order to win social approval. Indeed, using Goffman's front stage/back stage theatrical metaphor, a girl's "front stage" presentation of self as nice, non-critical, and non-argumentative may differ somewhat from a back stage self (Goffman, 1977) quite capable of critique and argument, in different social contexts (Krane, Choi, Baird, Aimar & Kauer, 2004). In addition, high social passivity correlated strongly with young age, and may be a function of age rather than gender role adherence, as it is measured here.

There is a third possible explanation for why social passivity did not predict either BID or weight loss behaviors, and for why high appearance investment predicted only BID but not weight loss behaviors as predicted. Close inspection of the sex-role and body image literature provides some evidence that it is not femininity per se that confers risk, but the absence of masculinity traits (e.g., agency, instrumentality, decisiveness, etc.) that confers vulnerability to body image disturbance (Lamke, 1982). The two indicators measured in this study (social passivity and appearance investment) do not cover a full range of sex-role traits and so may be endorsed as part of a fuller androgynous orientation rather than an indication of a feminine orientation only.

Fourth and finally, it is possible that the findings of this study are accurate. There is no relationship between gendered self-concept and body image distortion, or between gendered self-concept and weight loss behaviors as measured in a national sample with fairly limited indicators of sex-roles.

Appearance investment.

As expected, high appearance investment was associated with BID; however contrary to expectations it did not predict weight loss behavior at wave 2, controlling for time 1. Overall, there is little evidence from this study that high appearance investment plays an important role in the etiology of disordered eating. The possible reasons for why a stronger association was not found are very similar to those cited for social passivity. First, the measure of appearance investment is less than ideal. It only contained 2 items, and these were based on interviewer observation.

Second, high appearance investment is rewarded in our society and could increase overall self-esteem through reflected appraisals, even if high appearance investment is

motivated by insecurity or adherence to femininity rules. This paradox (femininity may increase risk, but it also reaps positive social rewards) makes femininity a difficulty construct for which to evaluate the true consequences. However, this is precisely the double bind that girls must face: to be feminine "enough" to reap the social rewards for femininity and yet to embrace sufficient masculinity to succeed as a student, athlete, and leader. Negotiating this balance may be stressful and confusing for girls when the contexts change (e.g., on the soccer field vs. on a date) or conflict.

Third, as noted earlier, this study contained no measure of masculinity traits, and so it is undetermined whether high appearance investment is an indicator of a feminine orientation, or just part of an androgynous orientation. Finally, it is possible that the findings of this study are accurate, and that there is no relationship between appearance investment and any weight loss behaviors.

Gendered self-concept as a whole.

Overall, as expected, findings of this study lend modest but not overwhelming support for the "femininity hypothesis," i.e., that a feminine gendered self-concept elevates one's risk for BID and unhealthy weight loss behaviors. Both low self-esteem and high appearance investment were associated with BID; and even under conditions of controlling for wave 1, low self-esteem still predicted onset of unhealthy weight loss behaviors between wave 1 and 2. There is even less evidence supporting the femininity hypothesis if one does not conceptualize self-esteem as an aspect of gendered self-concept.

The lack of strong support for the femininity hypothesis is surprising given ample evidence in the literature that a suggests feminine sex-role orientation is associated with

increased risk for body image disturbance (Hepp, Spindler & Milos, 2005; Strong, Singh & Randall, 2000) and disordered eating (Murnen & Smolak, 1997) and dieting (Lakkis et al., 1999). The studies in the literature suggest that vulnerability to body image and eating disturbance may be related to the construction of gender and adherence to femininity rather than to biological sex, a claim that was not well-supported by this study.

Among the most compelling evidence of the importance of femininity to body image disturbance and disordered eating is a careful meta-analysis of 22 studies on this topic that found a modest but significant association between adherence to female gender roles and disordered eating (Murnen & Smolak, 1997). Other studies have found similar empirical evidence of associations between gender role adherence and body image dissatisfaction (Strong et al., 2000) and dieting (Lakkis et al., 1999); and feminist scholars have been theorizing on these connections for many years (Ferguson, 1980; Spence & Helmreich, 1980; Brumberg, 1997; Frost, 2001). That body image disturbance, weight concern, dieting, disordered eating and clinical eating disorders are far more common in females than males is undisputed (Murnen & Smolak, 1997), though researchers do vary widely in the degree of attention they give to gender role phenomena in their explanations of the sex disparity.

Like this study, some scholars have explored feminine gender role adherence as a possible explanation for greater female overrepresentation in the cluster of symptoms and signs of body and food disturbance, and with good reason. Girls construct self-concepts within the parameters and value systems of their cultures, and in our 21st century society, gender role prescriptions for appearances and behavior are still highly salient (Frost,

2003), particularly during adolescence, a time of "gender intensification" (Wichstrom, 1999).

While there are certainly many ethnic and cultural variations in feminine ideals, especially among African American women (Bay-Cheng et al., 2002), pluralism of femininities is not widely acknowledged or reflected in mainstream media images, which are likely to display and reproduce a pervasive hegemonic femininity instead (Krane et al., 2004)(e.g., thin, attractive, heterosexual, fair skinned, young, nurturing, passive, approval-seeking). By contrast, hegemonic masculinity ideals connote power, action, agency, strength, and importance. Thus, the theorized relationship between hegemonic femininity and disturbances of body image/eating has been called the femininity hypothesis of disordered eating, pointing toward sociocultural determinants.

Theory.

However, feminist sociocultural theory doesn't adequately explain the variation in susceptibility to strict feminine ideals and self-concept among girls: if the world is awash in gendered prescriptions, why aren't all girls affected in the same way? Symbolic Interaction theory, with its emphasis on meaning-making and a person's individual as well as socially patterned interpretation of events as the mediator between a stimulus and a response, offers two explanations that address the observed variation in susceptibility of girls to feminine prescriptions. First, based on the role enactment principle from a Symbolic Interaction framework (Burr et al., 1979), the greater her and her significant social groups' sensitivity to role demands made by others, the more complete her role enactment. In other words, the more a girl internalizes the expectations of others to practice "femininity," the more likely she is to enact or display "feminine" behaviors

such as high appearance investment, weight preoccupation, and dieting. Internalization of reflected appraisals and interpretation of their meaning for her is each individual girl's domain, thus subject to wide variation. However, it is important to note that meanings are not completely individualistic. They are shaped and constructed in socially patterned ways through interaction with significant others and significant social cultural and identity subgroups. For example, peer groups, school cultures, and race/ethnic identities may affect meanings, degree of internalization of "mainstream" norms, reference groups with which to compare oneself, and the nature of reflected appraisals. Data that capture some of these contexts might be able to explain what seems like individual variation.

Second, the interpersonal competence principle in Symbolic Interaction posits that the greater the repertoire of roles, skills, and complexity of self-concept, the higher the interpersonal competence under stress (Burr et al., 1979). Under this principle, the societal pressures on girls to be thin, attractive and "feminine" are conceptualized as stressors (West & Sweeting, 2003); and the interpersonal competence principle draws attention to a double jeopardy. Not only are girls dealing with the stress of becoming women in a sexist context, but the gender-role expectations limit the repertoire of skills they can access with which to manage the stress. Girls with greater interpersonal competence may be less vulnerable to internalization of harmful body type ideals.

Body Image Distortion

In addition to gendered self-concept, another predictor of weight loss behaviors became apparent in the longitudinal analyses in answer to research question three, "Does body image distortion predict change in weight loss behavior?" Body image distortion is a strong predictor of the onset of both risky weight loss behavior and of dieting to lose

weight one year later. Question four goes on to ask, "Does body image distortion mediate the relationship between self-concept and weight loss behavior?" Results suggest that body image distortion mediates the relationship between low self-esteem and the onset of risky weight loss a year later; but body image distortion does not mediate between low self-esteem and dieting a year later. Thus, body image distortion is a mechanism through which self-esteem operates on risky weight loss behavior. These findings are consistent with theory and with the literature.

Definition of the situation proposition, within the Symbolic Interaction framework, posits that even though a girl may not be overweight, when a person defines a situation as real, it is real in its consequences. Thus, a girl who thinks herself to be fat when she is not, will behave in ways that are consistent with her perception of a "fat" reality. Perceived overweight becomes real in consequence, and so a girl diets and attempts weight loss. Similarly, these findings suggest that the relationship between low self-esteem and risky weight loss behavior is mediated by a girl's body image distortion, or her perception of the facts. Unlike body image dissatisfaction, which is far more commonly studied than distortion, body image distortion can be seen as a reflection of a girl's perception of reality that is based on her interpretation of the facts (e.g., weight, height, shape) rather than the facts themselves. Although self-esteem is a commonly evaluated correlate of risky weight loss behavior (Croll, Neumark-Sztainer & Story, 2002), no studies were found that examined body image distortion as a mediating factor between self-esteem and risky weight loss behavior, neither in cross-sectional or longitudinal designs. The current study lends support for Symbolic Interaction's

emphasis on a person's subjective interpretation and perception of the facts as a mediator between condition and behavior.

Weight Loss Behaviors

This study examined one to several weight loss behavior outcomes, depending on the research question. The three outcome variables were conceptualized loosely on a continuum of severity. Risky weight loss behavior e.g., vomiting, diet pills, laxatives, is the most severe of the weight loss outcomes; then dieting to lose weight; and then exercising to lose weight. Results suggested some support for this continuum, as body image distortion was most strongly associated with risky weight loss, slightly less so with dieting, and not at all with exercising to lose weight. Girls' decision to exercise was independent of their body image status; body image distortion was not a motivating factor to exercise. This finding is relevant because it can be argued that any weight loss activity driven by a distorted body image could potentially become unhealthy, excessive, or a trigger for feelings of ineffectiveness and shame. In general, findings here suggest that exercising to lose weight is not tainted in this way for most girls like dieting is. Along similar lines, a 5-year longitudinal study found that body image dissatisfaction is associated with unhealthy but not with healthy weight loss behaviors (Neumark-Sztainer, Paxton, Hannan, Haines & Story, 2006). There is a growing body of literature suggesting that dieting to lose weight among children and adolescents is ineffective, and that early dieting may elevate risk for fluctuating weight and obesity (Martin et al., 1999; Crow, Eisenberg, Story & Neumark-Sztainer, 2006; Stice, Presnell & Shaw, 2005).

Family Social Support

Research question five asks if high family social support predicts decreased odds of risky weight loss and if it moderates the association between body image distortion and risky weight loss. Findings suggest that high family support has a direct effect on risky weight loss behavior, with higher support predicting decreased odds of risky behavior. However, there was no interaction between BID and family support. High family social support did not buffer or lessen the risk of body image distortion on risky weight loss. Family social support and body image distortion each had a direct and separate effect on risky weight loss: high family support decreases the odds of risky weight loss and the presence of body image distortion increases the odds of risky weight loss behavior.

These findings suggest that that family relationships continue to be salient to teenagers throughout high school, and that high family social support decreases a girl's likelihood of engaging in risky weight loss. However, findings also suggested that there are limits to how much family social support can mitigate pathways of risk toward disordered eating and weight loss once BID has set in. Family social support does not appear to be sufficient to challenge the direct effects of body image distortion on risky weight loss. It appears that once BID sets in, it may be too late for mere family social support to alter girls' trajectory in a systematic way. If BID is present, perhaps more deliberate family intervention (e.g., family therapy, psychoeducation) is warranted for a girl to benefit from the influence of her supportive family.

Given ample evidence of the important role family support plays in the lives of adolescents, why does this study find that family support fails to moderate risky weight loss behavior for girls with BID? One possibility is that the distortion in body image may

be paired with a distortion in girls' perception of family support, thus confounding the results. For example, a recent longitudinal study found a decrease in girls' perceptions of maternal support as she acquired greater symptoms of disordered eating, but no decrease in perception of paternal support (Lee, 2006). Perhaps a competent mother's caring concern and worry over her daughter's distorted body image may actually be perceived as intrusive or judgmental by a teenage girl after BID has set in, and result in emotional distancing rather than buffering of risks of BID. Clearly, this is an area where further family research is needed to inform preventive practices and family interventions. It also highlights BID as pivotal in girls' risk for eating disorders.

We can conclude that family social support has a distinct, direct, and important role in reducing the odds of a daughter engaging in risky weight loss behavior. However, in public health terms, it does not rise to the level of "protective factor" that moderates a known risk, such as BID, for an adverse condition. These findings beg further questions about the potential role of the family in preventing disordered eating and body image distortion. The possibilities for exploring family contribution are many: does family social support affect self-esteem? Do different types of family support (e.g., emotional, instrumental) affect outcomes in different ways? Is family support the best measure, or should researchers examine family involvement, parenting style, parental monitoring, or other family processes that might influence girls' risk for disordered weight loss behavior? How does the influence of family change as girls' age and as there is symptom progression toward an eating disorder? Can family attitudes or processes "inoculate" their daughters against risk for body image distortion? With an eye toward prevention, the final research question of this study returns to the idea of gendered self-concept, and

explores family gender role attitudes that might set in motion a trajectory of risk or resiliency early in a girl's life.

Parental Gender Role Attitudes

Question six asks if parent gender role attitudes are associated with their daughters' gendered self-concept. Findings suggest there is a positive association between parent traditional gender attitudes and girls' high level of social passivity. However, there is no evidence of association between parent traditional attitudes and girls' appearance investment nor self-esteem as measured in this study. Based on a Symbolic Interaction perspective, the family is a primary early context for the emergence and negotiation of meanings and symbolic gestures pertaining to core identity markers in our society such as gender. Thus, it was hypothesized that these two constructs would be associated. The hypothesis was partially supported. Consistent with Symbolic Interaction theory, parent traditional attitudes are positively associated with daughters' level of social passivity. However, the question remains why parent attitudes were not related to appearance investment nor self-esteem; the literature suggests possible explanations.

Although past research has shown a positive correlation between mothers' and daughters' body image scores and self-esteem, it has also noted a lack of similarity between mother and daughters' degree of sex role adherence (Usmiani & Daniluk, 1997). A related study on the mechanisms of transmission of weight concern from mother to daughter concluded that simple modeling (i.e., resulting in sameness of weight concern) was not evident, that it was too simplistic, and that family transmission of weight concern

occurs in complex patterns of interaction with on-going interpretation (Ogden & Steward, 2000) rather than in a static manner. Studies highlighting the complexity of family transmission processes may partially explain why this study failed to find a relationship between parent traditional gender attitudes and the other aspects of girls' gendered self-concepts. Measurement weakness is also a plausible explanation for the lack of association, as the parent attitudes measure is based on a categorical single item in which parents are asked to make a forced choice between five options of what they think is most important for a girl to learn. The lack of a significant relationship could be explored further; some researchers have postulated that a mismatch between parent and daughter gender role attitudes could be source of stress that contributes to disordered eating (Murnen & Smolak, 1997), an hypothesis that could be tested.

Age, Race/ethnicity, and Parent Education

Though not hypothesized, relationships between the background (control) variables and outcomes are noted. Results suggested that early adolescent girls (ages 12-15) are less likely to report body image distortion, risky weight loss, or dieting to lose weight than older adolescent girls (ages 16-21). On the other hand younger adolescents are more likely to exercise to lose weight than older adolescents. Parent education is not related to body image distortion, risky weight loss, nor dieting to lose weight in any of the analyses after adjusting for the complex survey design through STATA survey commands. (Before adjustment, parent education of some college or more was associated with greater risk for all three outcomes.)

Consistent with other studies, African American girls were less likely than White girls to report body image distortion. However, in preliminary analyses the models were

run separately by race/ethnicity and the general patterns and trends in how gendered self-concept is related to outcomes remained similar for all race/ethnic groups despite differences in degree and therefore statistical significance. The on-line supplemental tables to a recently released study on prevalence and correlates of eating disorders based on the National Comorbidity Survey Replication showed that while Whites have a greater incidence of anorexia nervosa than minorities, African Americans and Hispanics have similar or even greater odds than Whites of reporting other eating disorders such as bulimia and binge eating (Hudson, Hiripi, Pope & Kessler, 2007).

Mind-body Relationship

Body image distortion and risky weight loss behaviors are accessible examples of the relationship between mind and body gone awry. Punitive thoughts and neglectful behaviors toward one's body may get incorporated into the self and feel normal. Blumer's concept of interpretation and meaning-making occurring in a dialogue with the self (Blumer, 1969) could be useful in studying this phenomenon. These negative perceptions and interpretations of one's body become one's reality and thus real in consequence. Part of the motivation for conducting this study was the opportunity to think more carefully about the phenomenon of body-mind dis-unity, or conflict, as manifested so clearly in body image distortion. Is it possible to observe and create measures to document the types and degrees of conflict between one's mind and body (or self and body), similar to couple conflict scales (e.g., extent of hostility, emotional abuse, physical abuse)? Would such a measure be a useful predictor of a broad range of health outcomes, including disordered eating and body image concerns? We have yet to map qualities of one's relationship with one's body that may be salient to health and mental

health outcomes, to understanding variation in vulnerability and resilience to risk factors in the environment such as thin-ideal images, and to prevention programs aimed at strengthening protective factors against body image disturbance and disordered eating.

Limitations

This study has several limitations. Perhaps the most obvious limitation is the quality of some of the measures. Girls' height and weight in wave 1 is by self-report only, and if there were any bias in reporting, this would affect the construction of BMI and BID items as well. One study using a community sample of 418 adolescents (ages 11-21) in Wales compared self-report and measured weight; and the study found that although the two types of measures were highly correlated (r= .95), there was an average downward bias of about two pounds on self-reported weight (Elgar, Roberts, Tudor-Smith & Moore, 2005), although the measured weight was taken with clothes and shoes, whereas students may have reported their bathroom scale unclothed weight, which is typically about 2 pounds less than fully clothed weight. Furthermore, the downward bias was predicted by greater measured BMI (Elgar et al., 2005). This and other studies comparing measured and self-reported weight consistently show that overweight persons are more likely than those of normal weight to show a downward bias in reporting their weight by an average of a few pounds (Elgar et al., 2005; Shapiro & Anderson, 2003). Some studies have concluded that these minor discrepancies have little consequence (Jeffery, 1996), and where there are consequences, it is generally in undercounting overweight or obese individuals (Elgar et al., 2005; Morrissey, Whetstone, Cummings & Owen, 2006). If Add Health data contains similar bias, this could result in an undercount of girls in the overweight category.

However, none of these studies assessed whether the downward bias affected both self-reported weight and self-reported perceived weight status (e.g., overweight, about right, or underweight), the two constructs used to determine BID. If the bias is consistent across both self-reported items, then a bias of a few pounds would not necessarily affect BID, since the relative relationship between constructs would be retained. However, if the bias is present only in reporting one's weight but not perceived weight status, or the bias is in opposite directions (e.g., reporting less pounds than is factual, but reporting greater/heavier weight status than is warranted), then the count of BID would be inflated. Even so, if the downward bias is only a few pounds, as reflected in the literature, this minor inaccuracy may not affect BMI enough to alter one's assigned weight status, since the categories are fairly broad. For future research, comparisons between the Add Health BMI data and other national BMI data during the same time period would help assess the accuracy of self-reported weight in wave 1 of the Add Health data.

The measures of appearance investment and social passivity were less than ideal, particularly in comparison to some of the lengthy multi-dimensional standardized scales found in the literature related to gender-role adherence (Murnen & Smolak, 1997). However, it was a learning exercise to try to best operationalize theoretical constructs within the limits of available survey items and few standardized scales, and rewarding to see that many of the findings are consistent with other studies. Many large-scale studies on body image and disordered eating are demographic in nature and lack theoretical mooring, and the countless small scale studies lack generalizability; so though imperfect, this attempt is arguably useful.

Measures of weight loss behaviors were likely to underestimate occurrence for several reasons. First, the wording on the question asks students to report if they have engaged in any of the weight loss behaviors in the past 7 days. Other national youth surveys such as CDC's Youth Risk Behavior Surveillance System (YRBSS) use a similar stem structure but specify the wider recall timeframe "in the past 30 days" (Lowery, Galuska, Fulton, Burgeson & Kann, 2005), which is less restrictive. Secondly, the response set includes many but not nearly all indicators of risky weight loss or disordered eating patterns. For example, it does not ask about fasting to lose weight, skipping breakfast or other meals to lose weight, or use of crash or fad diets that promise quick weight gain, even though these are likely methods for teenagers. It did include a generic "other method" response category, which had a higher response than the risky methods questions but was not interpretable because the meaning was too vague.

Measures of weight loss behavior may be incomplete. Data were available on weight loss or weight gain activities, but no data were gathered about irregularity of eating, binge eating, time of eating or other eating pattern questions, all behaviors as important as weight loss strategies in determining risk for disordered eating. Several recent epidemiological studies have found that binge eating and "eating disorders not otherwise specified" (EDNOS) as listed in the DSM-IV (American Psychiatric Association, 1994) are far more prevalent than previously estimated, including among men and minorities, and are not necessarily linked with weight loss efforts (Hudson et al., 2007; Lowery et al., 2005). These cases are ignored in studies using Add Health and similar national data on youth behavior.

Finally, this study has no direct measure of societal influences or exposure to risk (e.g., saturation of thin-ideal images, culture of school environment), and so cannot control for prior exposure. It assumes that all girls by virtue of residing in the United States are exposed to similar gender socialization processes, which is probably not accurate. Measuring parent attitudes was one way to try to quantify the type of family socialization girls may have experienced, but as shown it was not a sensitive measure in the pathways of risk explored here.

Non-imputable missing data on girls' weight and height resulted in about 150 missing cases for BMI scores and body image distortion variable. Although follow up tests suggested no significant differences between missing and non-missing cases on the independent variables, dropping these cases resulted in loss of power. Missing data were also problematic on the two items taken from the parent survey, which had lower completion rates than the student survey. Though able to capture missing data on parent education from other sources, it was not possible to capture, replace or impute missing data on the parent attitude item.

In general, sample size is not a problem with Add Health data, but cell size was quite small for the risky weight loss behavior variable, which is why all three methods (diet pills, laxatives, vomiting) were combined into one indicator rather than analyzed separately. The Add Health public use data set was used here; however I have begun the careful process of running the study's variable construction programs on the larger restricted data, and will run these and future analyses on the larger sample. This will increase my sample size on the weight loss behavior variables and refine my results.

Another limitation of using waves 1 and 2 of Add Health is that the data, gathered in 1995-1996 are arguably becoming outdated. My rationale, however for using Add Health is justified for two reasons. First, a national study of trends over the last decade in weight management behaviors among youth in the U.S. revealed no significant change among girls from 1991 to 2001. It did however find an increase in weight loss and maintenance efforts and rigorous exercise among boys (Lowery et al., 2005). The weight management question items in that study (CDC's Youth Risk Behavior Surveillance System) were very similar to those in Add Health, and these findings suggest that the weight loss behaviors reported in Add Health 1995-1996 are still relevant.

The second reason for using Add Health is that there is on-going commitment from the National Institutes of Health to follow respondents into adulthood. Wave 3 is now available and wave 4 is under development. This affords the opportunity to examine the relationships between body image or weight loss behaviors in adolescence with BMI, weight loss behaviors, and mental health indicators in young adulthood. A third reason for using Add Health is that it oversampled middle income African Americans, which in future studies will allow important within-group analyses to disentangle the effects of race and class on body image and weight loss behaviors.

Finally, the approach taken with regards to race/ethnicity in this first study, as control variables, is a limitation that will be addressed in future studies. The topics of gender identity, constructions of femininity, body image, and weight management are embedded in contexts of culture, race, ethnicity, social class, and history. This study is a beginning foray into this terrain; and regrettably it was beyond the scope of this study to do repeated analyses for all race/ethnic groups on each hypothesis, though this is planned

as a follow-up study. To ensure examining girls under aggregated race/ethnic conditions was appropriate for a first study, preliminary analyses were run separately for each race/ethnic group. The factors associated with BID appear to be similar across race/ethnic groups. While strength of associations, standard errors, and therefore significance of relationships differed somewhat by race/ethnicity, and particularly for African American girls, the direction of coefficients did not differ. However, overall levels of BID and the direction of distortion (overestimation or underestimation) do differ by race/ethnicity; and thus further examination of processes within race/ethnicity is an important topic for future research.

Other race/ethnic differences in the bivariate findings are intriguing, such as that high self-esteem is correlated more strongly with African American identification than with any other racial/ethnic selection. Another intriguing finding is that while African American girls have similar rates of "any distortion" in body weight perception to Whites and Hispanics, it occurs in the opposite directions than other groups: African American girls tend to underestimate their weight at the same rate that Whites and Hispanics overestimate their weight. Another interesting finding is that Asian women had similar rates of body image distortion (overestimation) as Whites and Hispanics, though obesity rates are low among Asians. Hopefully exploring these and other culturally distinct patterns with the larger restricted Add Health data will allow sufficient sample sizes to conduct appropriate between and within-group analyses in the near future.

Implications for Theory and Practice

In many ways Symbolic Interaction seems particularly well suited for the study of body image distortion and its behavioral sequelae. It emphasizes the pivotal nature of

interpretation, perceptions, and meaning-making forged within the context of on-going relationships, that accounts for wide variation in response to stressors. Many of the propositions of Symbolic Interaction are testable (Burr et al., 1979) and offer common sense explanation to body image issues, as suggested by this study. The theory acknowledges the contextual nature of self-representation and eschews notions of a static self-concept or static behavioral profile. Symbolic Interaction theory has also elucidated the self-body relationship as observable, inseparable, and engaged in on-going dialog. The self-body construct opens the possibility of conceptualizing this relationship as an entity of study, possibly including measurement of typical relationship characteristics such as level of intrapersonal conflict, hostility, connection, and withdrawal (dissociation). We have limited language for discussing the quality of self-body relationship at this time. Symbolic Interaction theory and feminist work in the areas of embodiment and self-objectification theory (Fredrickson & Roberts, 1997) could inform development of this idea.

Despite the ease with which one can apply Symbolic Interaction theory to this topic, is it a satisfactory guide to the development of effective interventions and programs to reduce body image distortion and its behavioral sequelae? Ultimately, research must move beyond observation, description and explanation, toward application. Is the theory useful? In general, Symbolic Interaction theory suggests that positive youth development (building assets rather than just targeting symptom reduction) is an effective approach to building interpersonal competence and resistance against stress. As a sociological theory, Symbolic Interaction has been used to map and guide observation of social interactions,

but perhaps less so as a guide to interventions that attempt to apply these observations to acts of human caring and alleviation of distress. Is this theory relevant to practitioners?

With regards to gender socialization, this study offers little support for this as a target of intervention. However, the literature must also be considered. There is a some consensus among researchers that optimal gender socialization includes competence in both masculine and feminine roles and skills. Symbolic Interaction theory seems to suggest that greater attention might be given to opportunities girls (and boys) have to explore and develop a full repertoire of human skills and behaviors, regardless of gender, that lead to social competence and mastery in multiple domains. Inclusive athletic programs in schools and the community encourage teamwork, healthy competition, physical activity and fitness, and a self-concept that includes experience of the body as strong and capable not just decorative. Alternative physical education classes in schools such as dance, yoga, and weight training may be more appealing to some girls than team and performance sports. Programs in school or community, as well as informal relationships with older adults, that teach practical life skills are recommended. Who knows what has been lost in the elimination of practical life-skills classes such as home economics and industrial arts in so many public schools, rather than extending them include both genders and updating them to build competence in a technological world?

Perhaps in our public frenzy to raise academic test scores, we are inadvertently narrowing the range of valued competencies in our youth –to the intellectual domain- rendering them more susceptible to stress because academic imperfection can threaten their sense of worth. Some scholars have noted that in the absence of meaningful and varied culturally-valued markers of maturity and competence among youth, they are

filling the void with consumer-driven identities, appearances, and visual displays of purchased selfhood: “shopping for subjectivities” (Frost, 2003) or products that will communicate an identity to the world. In contrast, youth programs, schools, communities and family cultures that promote real skill development, embodied hands-on learning, mastery of hobbies and interests, apprenticeships with more experienced experts, meaningful service and contribution to the common good, and responsibilities that confirm mattering and belonging among both girls and boys hold promise for correcting the problems that have given rise to an appearance-obsessed culture. These ideas are testable.

Body image distortion seems to be a common problem, and healthy weight promotion programs should emphasize and teach accurate self-assessment of weight, especially in light of the dynamic interpretation of BMI for weight status until age 21, and the fact that BMI is not sensitive to adiposity vs. muscularity weight. School-based or community-based programs aimed to prevent body image distortion and disordered eating among should consider including the following components: nutritional education, sexual health education, screening for body image distortion, media literacy and critical thinking about gender and body messages, recognizing and stopping body teasing and sexual harassment, body appreciation for its strength and vitality, understanding beauty as a cultural artifact, and opportunities for activism on behalf of gender equality. Though controversial, I believe that offering some of these components in coed settings is important. Together, girls and boys construct their social realities and if boys are excluded from efforts to critique and improve the social climate they are overlooked as possible allies.

A possible direction for family education and therapy is to consider how families might actively inform and teach their daughters and sons to recognize and confront sexism, body-based teasing, sexual harassment, and unspoken gender role codes that are invoked to ridicule or restrict human expression. Although there is little consensus on what makes girls more or less susceptible to body related concerns, and the extent to which gender socialization is implicated, there is no need to wait for that jury to begin efforts to inoculate and strengthen girls' abilities to recognize and resist sexism. It may be that in doing so we discover new pathways of resilience. Lessons from African American parents in how they inoculate their youths against racism and socialize or formally teach them to resist external judgments on their physical appearance, and to notice, resist, and redress racist commentary in the world could be very informative.

Future Directions

This study is a small beginning. Hopefully its strengths, limitations, and inevitable mistakes will serve as grist for honing future work that can contribute meaningfully to the areas of gender and health, mind-body health, and the family as a socializing influence on health beliefs and behaviors. There seem to be opportunities for both quantitative and qualitative exploration, with an emphasis on understanding how family processes around food, the body, and self-care in diverse families affect health-related decision-making, health-care utilization, and health outcomes among family members.

Several follow-up studies based on Add Health are planned. As mentioned earlier, follow-up analysis on race/ethnic variations for these models using the larger restricted Add Health data will enable me to make between and within group comparisons by race and SES. So far few studies in this topic area have been published using wave 3 of Add

Health, and this is an opportunity to use three waves of longitudinal data to examine continuity and discontinuity over time in body image distortion, weight status, and weight loss behaviors. A typology of dieting could be developed (chronic dieting, ineffective dieting, effective dieting, etc.), with an assessment of health outcomes. I am particularly interested in the long term effects of body image distortion, reported during adolescence, on subsequent weight, eating patterns, and mental health in adulthood. It will also be possible to examine long term effects of dieting as a teenager on BMI as an adult. Wave 4 of Add Health will include the mates, children, and parenting practices of the original Add Health participants, enabling further study of family level variables.

An area of interest that I had hoped to pursue in this study was in constructing a positive body image rooted in a sense of vitality and connection between mind and body. I constructed such a variable ""vitality" with these data but had to drop it from analyses because of its high correlation with self-esteem. While ample literature exists about body image disturbance, disordered eating, and negative outcomes of these conditions, there is scant attention to the description, correlates, or psychosocial process of constructing a positive body image. Furthermore, the term "body image" connotes in itself the notion of an objectified body, i.e., the perception of one's "image," or how ones weight and shape appear to an onlooker (whether the onlooker is the self or a perceived other). This type of body image has been termed the "ornamental" body and has been contrasted to an "instrumental" body self-appraisal. Instrumental body self-appraisal refers to one's perception of the functionality of the body, such as its strength and health (Gusella et al., 2004). Research is needed that moves the field beyond examination of negative body image toward a positive construct of bodily vitality that includes bodily experiences that

are not appearance-based (e.g., experiences of bodily strength, energy, fitness, health, etc.). The Add Health data make this possible and I will pursue study of this construct in a follow-up study.

Finally, the empirical literature on body image and disordered eating/weight management focuses almost exclusively on a narrow set of constructs operationalized as variables to study, such as body dissatisfaction, body distortion, weight loss behaviors, self-esteem, self-efficacy, weight concern, gender role adherence, and screening for clinical eating disorders. There are a few innovative constructs under study, such as self-objectification (Fredrickson & Roberts, 1997), but many of the studies seem to be a shuffling of variables. Perhaps this study is guilty of the same, despite efforts to use and apply theory. For all the decades of research that has been done in this area, there is no evidence that we are reversing the trend toward body image dissatisfaction, disordered eating/dieting, and one of their pernicious sequela, obesity. At some point in this field of research I anticipate there will be a breakthrough, or several, with new ways of seeing the problem that translate more directly into effective public health programs, family education, and preventive health care practices.

What are the questions and approaches that can move the field forward out of the morass of what Herbert Blumer called endless "variables analysis" (Blumer, 1969)? Certainly a focus on translational research, as recommended by the National Institutes of Health, is sorely needed, i.e., summarizing and applying what we already know about body image and disordered eating to intervention and prevention programs, and testing their effectiveness in a systematic ways through intervention research. This and greater

attention to theory, to family and other contexts, to variation within and between groups, and to collaboration across disciplinary lines, is a sound beginning.

Appendix A

Table A

Survey Items Used from National Longitudinal Study of Adolescent Health

Variable	Survey item operationalization	Survey source[a]
Biological sex	Are you a male or a female?	Student, wave 1
Date of birth	What is your birth date [month and year])?	Student, wave 1
Date interview	Mark month, year of survey	Student, wave 1
Age	Calculated from above	Constructed, from wave 1
Race/ethnicity	Are you of Hispanic origin? Check your race/ethnicity …African American …White …Asian …[remainder collapsed into Other]	Student, wave 1
Parent education[b]	How far did you go in school? How far did you [or your mother/father] go in school? …8th grade or less …some high school …HS graduate …GED …some college …vocational training after HS …college graduate	Parent, wave 1 & Student, wave 1
Height	What is your height in feet? What is your height in inches?	Student, wave 1
Weight	What is your weight?	Student, wave 1
Body mass index (BMI)	BMI= weight in pounds / (height in inches)sq *703	Constructed, from wave 1
BMI-based weight status[c](per CDC's age-adjusted BMI classification tables)[b]	BMI for age= …underweight …healthy weight …risk for overweight …overweight	Student, wave 1
Body image (BodImageW1	How do you think of yourself in terms of weight? …very underweight …somewhat underweight …about right …somewhat overweight …very overweight	Student, wave 1
Body image distortion[d]	Discrepancy between body image (perceived weight status) and BMI-based weight status	Constructed, from wave 1

	Are you trying to … lose weight … gain weight … stay the same weight … not trying to change your weight	
Risky weight loss behavior	During the last 7 days, which of the following things did you do in order to lose weight or to keep from gaining weight? …dieted …exercised ---made yourself vomit …took diet pills …took laxative …other …none	Student, waves 1 and 2
Dieting to lose weight	…dieting	Student, waves 1 and 2
Exercising to lose weight	…exercising	Student, waves 1 and 2
Attention to grooming	Interviewer: How well groomed is the respondent? (1-5)	Student, wave 1
Physical attractiveness	Interviewer: How physically attractive is the respondent? (1-5)	Student, wave 1
Appearance investment	Summed score (2-10) of following items:	Constructed (sum).
	R's attention to grooming (1-5) R's physical attractiveness (1-5)	Interviewer report on student survey, wave 1
Social passivity	Summed score (2-10) of following items:	Constructed from wave 1
	You never criticize anyone (1-5) You never argue (1-5)	Student, wave 1
Self-esteem	Summed score (6-30) of following items: You have a lot of good qualities You have a lot to be proud of You like yourself just the way you are You feel like you are doing everything just about right You feel socially accepted You feel loved and wanted	Student, wave 1
Parent traditional attitudes	Yes if marked 1,3 or 5 below: Of the following, which do you think is the most important thing for a girl to learn? …to be popular …to think for herself …to help others …to work hard …to be well-behaved	Parent, wave 1

Family social support	Summed score (4-20) of the following items:	Constructed from wave 1
	How much do you feel that your parents care about you? (1-5) How much do you feel that you and your family have fun together? (1-5) How much do you feel that your family understands you? (1-5) How much do you feel that your pays attention to you? (1-5)	Student, wave 1

[a] Student = in-home student survey; Parent=parent survey. [b]Parent education categories were then collapsed into four (less than HS, HS/GED, some college, college grad) and three level variables (HS or less, some college, college grad). [c]BMI-based weight status as per CDC's 2000 age-adjusted BMI classification tables. [d]Body image distortion refers to overestimating one's weight for this study.

Appendix B

Table B

Logistic Regression Predicting Change in Exercise to Lose Weight between Waves and Testing BID Mediation

	Exercising to Lose Weight at W2								
	Model 1			Model 2			Model 3		
Predictor variable	B	*SE B*	e^B	B	*SE B*	e^B	B	*SE B*	e^B
Hispanic	-.160	.155	.852	-.050	.155	.951	-.054	.155	.947
African American	-.439**	.133	**.857**	-.304*	.138	**.738**	-.270	.138	.764
Asian	-.298	.213	.743	-.293	.241	.744	-.293	.244	.746
Other	-.375	.480	.687	-.370	.424	.691	-.341	.440	.711
Early Adolescence	.236*	.108	**1.266**	.245*	.111	**1.278**	.278*	.111	**1.32**
Parent ed some college	.266*	.110	1.305	.175	.121	1.191	.182	.120	1.120
Parent ed college grad	.331**	.113	**1.393**	.260*	.128	**1.230**	.251	.128	1.285
Self-esteem	.006	.014	1.006	.007	.015	1.007	.017	.016	1.017
Appearance invest	-.054	.031	.947	-.056	.033	.946	-.065	.033	.937
Social passivity	.002	.029	1.002	-.010	.032	.990	-.015	.032	.985
Exercise to lose wt W1				1.35***	.094	**3.858**	1.318***	.092	**3.736**
Body image distortion							.444***	.113	**1.559**
Constant	-.175	.389		.484	.428		.750	.431	
N=	2370			2370			2370		
Design F =	F (10, 121) = 3.34			F (11, 120) = 21.53			F (12, 119) = 21.05		
Prob> F =	.000			.000			..000		

Note: B=coefficients, *SE B*=standard error of coefficient, $e^{B=}$ =odds ratio. Reference categories are White race/ethnicity, later adolescence (16-21 y.o.), and parent ed HS or less.
*$p < .05$ **$p < .01$ ***$p < .001$

Appendix C

UNIVERSITY OF MARYLAND
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Notice: IRB Review Is Not Required Because Research Does Not Involve Human Subjects

Date: September 14, 2005

To: Sandra Hofferth, Ph.D.
Janet M. Liechty
Department of Family Studies

From: Roslyn Edson, M.S., CIP RaE
IRB Manager
University of Maryland, College Park

Re: IRB Application #05-0413
Title of Research Project: *Adolescent Family Relationships, Gender Socialization, Body Image and Dieting*

Type of Application: Initial

The above-referenced Institutional Review Board (IRB) initial application does not include any activities that meet the Federal definition of research involving human subjects. Specifically, the analysis of existing data that does not contain individually identifiable information is not research involving human subjects. Individually identifiable data is data for which the identity of the subject is or may readily be ascertained by the investigator or associated with the information. Examples of individually identifiable data include information with a subject's name and information with a code that links data to a subject's identity. Since the existing data does not contain individually identifiable data, the application does not need to be reviewed by the IRB under the requirements of the U. S. Department of Health and Human Services (HHS) regulations at 45 CRR Part 46 and the University's Federal Wide Assurance. Therefore, the application was not reviewed under exempt, expedited or full Board review procedures. However, if you plan to modify your research to include any of the following activities, you are required to submit an IRB application and obtain prior IRB approval: obtaining data through intervention or interaction with human subjects; obtaining identifiable private information about living individuals; or analyzing identifiable private information about living individuals.

Please contact the IRB Office at 301-405-0678 if you have any IRB-related questions or concerns. Please refer to the above-cited IRB application number in any future communications with our office regarding this research.

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