

APPLYING THE ELABORATION LIKELIHOOD MODEL OF ATTITUDE CHANGE  
TO REDUCE ANTI-FAT PERSON ATTITUDES IN ADOLESCENTS

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## Abstract

This study investigated the degree to which two types of interventions stimulated changes in adolescents' attitudes and beliefs about people who are obese. The main research questions focused on whether an intervention based on the Elaboration Likelihood Model of attitude change would produce a greater reduction in anti-fat person attitudes and beliefs about obesity than an intervention that did not utilize this framework. The effectiveness of the two types of interventions was assessed with middle school students at a K-12 laboratory school. Students completed pre-intervention, post-intervention, and follow-up surveys about their anti-fat person attitudes and beliefs about the controllability of obesity. The amount of change in attitudes and beliefs was assessed within and across the two intervention groups. The hypotheses of the study predicted that the intervention which integrated the elaboration likelihood model would produce a greater reduction in anti-fat person beliefs than the intervention which did not integrate elaboration-enhancing activities. The hypotheses also predicted that a reduction in beliefs about the controllability of obesity would occur across both interventions but that this reduction would be maintained only in the elaboration-enhancing condition. A multivariate analysis of covariance was used to analyze the data. After controlling for the variable of the teacher present during the time of the intervention, the results showed an equal and significant reduction in the endorsement of anti-fat person attitudes and controllability beliefs across both the information-centered and the elaboration-enhancing interventions. The reduction in anti-fat person beliefs was maintained at the two and one-half month follow-up. Similarly, beliefs about the controllability of obesity remained significantly lower at the two and one-half month follow-up survey.



## **CHAPTER 1: INTRODUCTION**

Anti-fat person attitudes are one of the most pervasive yet least recognized psychosocial stressors that affect obese children today. Many prevention and intervention efforts have focused on lifestyle and health-related aspects of obesity, yet few have addressed the emotional and health consequences that result from the social marginalization of obese children. As the prevalence of obesity continues to rise, an increasing number of children are at risk for the psychosocial consequences of anti-fat person attitudes. Many of these psychosocial consequences appear to result from the teasing that obese children receive from peers within the school setting. Thus, it is important to develop educational interventions for school curricula that will reduce anti-fat person attitudes among school-age children. A few researchers have assessed psychoeducational interventions in classroom settings; these interventions, however, were largely unsuccessful in reducing negative fat stereotypes and associated negative attitudes (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000).

In order to increase the effectiveness of psychoeducational interventions, it may be necessary to incorporate specific principles of attitude change into the interventions. While traditional psychoeducational presentations rely on the presentation of information to facilitate change, presentations may be more effective if they are structured to encourage students' critical thinking about the information provided. This critical

analysis or “cognitive elaboration” requires mental manipulation of the information, resulting in the in-depth processing that is associated with better encoding and increased likelihood of attitude change. Thus, a comparison of information-centered presentations and elaboration-enhancing presentations is necessary to determine which method will more effectively reduce anti-fat person attitudes.

### **Rise in Childhood Obesity**

In 2004, Lobstein, Bauru, and Uauy, members of the International Obesity Taskforce, called the rise in childhood obesity a “crisis in public health.” They noted that data obtained during the 1990s reflected an increase of additional .5% obese children per year. In the Americas, the overall prevalence of overweight children ages 5-17 was over 30%. Close to 10% of them were in the category of obese according to measures of body mass index and waist circumference (Lobstein et al., 2004).

Researchers of childhood obesity frequently emphasize the rising prevalence as well as the health and psychosocial risks that are associated with obesity. The most frequently cited health risks for obese children include increased risk for diabetes, sleeping disorders, asthma, fatty liver disease, menstrual issues, and cardiovascular problems (Daniels, 2006; Friedlander, Larkin, Rosen, Palermo, & Redline, S., 2003; Lobstein et al., 2004). The psychological difficulties that are most commonly associated with childhood obesity include low self-esteem, social isolation, and depression (Daniels, 2006; Friedlander et al., 2003; Lobstein et al., 2004; Schwartz & Puhl, 2003). The studies that assess the psychosocial wellness of obese children have mixed results, such that there are not consistent correlations between body mass index and psychosocial

functioning. In some studies where findings did reflect correlations between body mass indices and decreased psychosocial adjustment, authors recommended weight loss as the strategy that would resolve the problem (Friedlander et al., 2003; Hesketh, Wake & Waters, 2004). This perspective assumes that the excess weight alone is the cause of obesity-related health and psychosocial risks. Thus, intervention efforts have focused predominantly on improving individual diet and exercise regimens. This approach has been ineffective in achieving long-term weight-loss and may cause children to develop disordered eating patterns (Heatherton & Polivy, 1992; Neumark-Sztainer et al., 2002).

Some researchers (Bauer, Yang & Austin, 2004; Brownell, Schwartz, Puhl, Henderson & Harris, 2009; O'Dea, 2000) have suggested that to more effectively address the problem of childhood obesity, the emphasis must shift from a focus on the individual child to the broader sociocultural context. This perspective calls for focusing on the availability of nutritious food, increasing physical activity levels in the communities, and finding optimal ways of incorporating health programs at schools (Bauer et al., 2004; Brownell et al., 2009; O'Dea, 2000). In addition, those who conduct research on the sociocultural variables related to obesity have found that anti-fat person attitudes contribute to both the physical problem of obesity and the psychosocial consequences that are often associated with it. They have indicated the need for reduced anti-fat person attitudes as part of a comprehensive response to childhood obesity (Puhl & Latner, 2007).

### **Anti-fat Person Attitudes Toward Obese Children**

Research studies spanning the last five decades have confirmed both the presence of anti-fat person attitudes and its negative psychosocial consequences. In 1961,

Richardson, Goodman, Hastorf, and Dombusch showed children pictures of other children who were obese or had physical disabilities. They asked children to order the pictures according to their preference for the children depicted as possible playmates. Children consistently ranked the obese child last, indicating that they did not prefer the child as a potential playmate. Since 1961, researchers have replicated Richardson et al.'s study several times and have obtained similar results. Some studies (Bacardi-Gascon, Leon-Reyes, & Jimenez-Cruz, 2007; Latner & Stunkard, 2003) were full replications while others (Brylinsky & Moore, 1994; Lerner & Gellert, 1969) used different types of stimuli such as photographs or updated line drawings of the children. The striking aspect of the literature base is the consistency of the findings. Most children rated the obese child as the least preferred friend in all studies. The adjectives used to describe the fat body type were consistently more negative than adjectives used to describe the average and thin body types. Findings also reflected that individuals hold negative attitudes toward obese people regardless of their own body size, ethnicity, sex or age (Greenleaf, et al., 2006; Latner, Stunkard, & Wilson, 2005; Lerner, Karabenick, & Meisels, 1975).

In comparing the current degree of anti-fat person attitudes to that reflected in earlier studies, Stunkard (2003) found that children are even less likely to play with those who are obese than when anti-fat person attitudes was first assessed. Researchers have compared the stigma of being obese to the stigma of being a racial minority because individuals from both groups experience similar psychosocial stressors (Monello & Maver, 1963; Puhl, Andreyeva, Brownell, 2008). Obese children may feel stigmatized at an early age. Some research indicates that anti-fat person attitudes are already present in

children as young as three years (Cramer & Steinwert, 1998). Other studies show that these attitudes strengthen with age (Bell & Morgan, 2000; Brylinsky & Moore, 1994; Cramer & Steinwert, 1998; Lerner et al., 1975). The increase in the strength of anti-fat person attitudes may account for results from longitudinal studies that indicated a gradual worsening of weight-based teasing and psychosocial problems for obese children (Davison, Markey, & Birch, 2003; Janssen, Craig, Boyce & Pickett, 2004). The consistent confirmation of anti-fat person attitudes across population samples and demographic variables parallels the pervasive existence of weight-based teasing and the social marginalization of obese children.

### **Weight-based Teasing and Social Marginalization**

The results of several studies on anti-fat person attitudes showed that those who endorsed these attitudes were less likely to play with obese children or view them as friends (Greenleaf, Chambliss, Rhea, Martin, & Morrow, 2006; Strauss & Pollack, 2003). Several large-scale studies showed that obese adolescents consistently experienced higher levels of weight-based teasing than average weight peers (Eisenberg, Neumark-Sztainer, & Story, 2003; Neumark-Sztainer et al., 2003; Griffiths, Wolke, Page, & Horwood, 2006; Haines, Neumark-Sztainer, Eisenberg, & Hannan, 2006; Janssen et al., 2004). The adolescents reported that they found the teasing distressful and had to endure it on a daily basis (Eisenberg et al., 2003). This teasing appears to be a major contributor to the psychosocial difficulties that are associated with adolescent obesity (Eisenberg et al., 2003). The psychosocial consequences of weight-related teasing include decreased self-esteem, decreased body satisfaction, increased depressive symptoms, increased suicidal

ideation, and increased suicidal attempts. The amount of weight-based teasing in the adolescents' school and home environments also accounted for more of the variance in psychosocial functioning than differences in body weight alone (Eisenberg, et al., 2003; Faith, Leone, Ayers, Moonseong, & Pietrobelli, 2002; Griffiths et al., 2006; Haines et al., 2006; Storch et al., 2007). These associations were consistent across variations in body mass index, school level, and ethnicity in all of the above studies.

The increased number of obese children does not seem to have normalized the condition. Rather, several studies have shown an equal or greater amount of stigma attached to obesity in the last decade (Andreyeva, Puhl & Brownell, 2008; Latner & Stunkard, 2003). As child obesity rates continue to rise, the adverse psychosocial consequences of anti-fat person attitudes will likely affect more children (Puhl & Latner, 2007). Thus, more psychoeducational interventions studies are necessary to inform educators, parents, and other adults about the most effective ways to decrease anti-fat person attitudes (Brownell et al., 2009; Puhl & Latner, 2003).

### **Efforts to Reduce Anti-fat Person Attitudes among Children**

Pejorative fat stereotypes reflect the association between the perception that people can control their obesity and negative attitudes toward obese individuals. For example, two commonly endorsed stereotypes of obese people characterize them as lazy and without self-control. Many people believe that weight is a physical attribute that people can completely control. This belief leads to the perception that obese people are choosing not to reduce their weight or lacking the willpower to refrain from overeating (Greenleaf et al. 2006, Puhl, Schwartz & Brownell, 2005). Intervention efforts have tried

to reduce negative stereotypes and anti-fat person attitudes by providing information about the complex etiology of obesity. These efforts focus on counteracting the assumptions that people are obese because they lack self-discipline in their eating or activity regimens (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000; Crandall, 1994; Dejong, 1980; Musher-Eizenman, Holub, Miller, Goldstein, & Edwards-Leeper, 2004, Irving, 2000). These intervention efforts did change beliefs about the etiology of obesity, but they did not reduce anti-fat person attitudes or negative stereotyping of obese people. Although these few studies do not permit generalizations about the interventions' effectiveness, it may be that education about the etiology of obesity is a necessary but insufficient strategy to achieve attitude change.

According to persuasion research, attitude change is most likely to occur when message recipients think critically about the messages provided (Cacioppo, Claiborn, Petty, & Heesacker, 1991). A well-known model of attitude change is the Elaboration Likelihood Model of Persuasion (Cacioppo et al., 1991). According to this model, two routes of processing information, the peripheral route and the central route, affect attitude change. The peripheral route involves perceptions of the message source and other, non-content related message features. Sources that are attractive or credible are more likely to induce attitude change, but the attitude shift is often temporary. It seems the recipient has attended to the message sender but not the message itself. By contrast, central route processing refers to cognitive processing of the actual information in the message and is associated with a greater likelihood of long-term attitude change. Central route processing is most likely to occur when message recipients are highly motivated and able

to analyze the message. Motivation is often higher if they perceive the information as personally relevant. Attempts to change attitudes when people perceive the information as personally irrelevant are unlikely to succeed without extra attention to increasing a person's involvement with the issue. When central route processing does occur, there is a higher likelihood that the resulting attitude changes will be lasting and resistant to persuasion. Thus, it is especially important that messages are subjectively positive because subjectively negative messages that are centrally processed may result in lasting negative attitude change.

Incorporating the principles of attitude change into a psychoeducational intervention may provide information about the most effective methods of reducing anti-fat person attitudes in schools. Because shared cultural beliefs about the controllability of obesity appear to be the main source of anti-fat person attitudes, psychoeducational interventions can simultaneously provide accurate information about health while also attempting to alter these faulty belief patterns. Integrating the elaboration likelihood model into intervention attempts may facilitate the central route evaluation needed to produce attitude change.

### **Statement of the Problem**

Although the elaboration likelihood model of persuasion has predicted the effectiveness of various attitude-related interventions (Ernst & Heesacker, 1993; Hague & White, 2005), researchers have not tested the utility of integrating this model into interventions to reduce anti-fat person attitudes with school-aged children. The traditional psychoeducational interventions have been effective in changing the obesity-



etiology beliefs of children in primary grades but have not reduced anti-fat person attitudes. Furthermore, no researchers have tested psychoeducational interventions with adolescents in middle school. Additional research that tests the effectiveness of psychoeducational interventions about obesity will inform successful integration of stigma-reduction efforts into school wide curricula.

### **Purpose of the Study**

Despite the broad literature base that substantiates both the existence of anti-fat person attitudes and the psychosocial harm that results from them, few researchers have evaluated psychoeducational interventions that might reduce negative anti-fat person attitudes. In fact, most of the studies on anti-fat person attitudes have focused on continuing to substantiate their existence despite the consistent confirmatory findings over the last five decades. At this point, research needs to address the question of which interventions will be the most effective in creating both immediate and long-term reduction in anti-fat person attitudes. Intervention efforts that focus on addressing the rise in obesity only through education about food intake and exercise do not address the psychosocial effects of anti-fat person attitudes. This approach may actually worsen the problem because it increases perceptions of obesity as completely within a person's control (Lewis & Cash, 1997).

The purpose of this study is to test the relative effectiveness of two psychoeducational interventions to reduce negative anti-fat person attitudes. The study utilizes a pre and post structure to facilitate comparison of students' baseline anti-fat person attitude with their attitudes following the interventions. Follow-up measurements

provide information about the durability of attitude change. Both interventions were presented in a local secondary school. One of these interventions will be the standard presentation of information about the etiology of obesity while the other intervention will include the same presentation but with a follow-up activity that will facilitate elaboration about the information presented. The Elaboration Likelihood Model of Persuasion predicts that attitude change is more likely to occur when information is presented in a format that facilitates critical thinking. It predicts that this change will be in the desired direction if the receiver perceives the message as positive and if students have a high level of involvement with the issue presented. Some research indicates that elaboration is especially likely to occur when individuals formulate arguments that are contradictory to the premises for the attitudes that they hold (Widgery & Miller, 1973). Thus, integrating activities that allow students to use the information to produce an argument that will persuade others to revise their opinions about the controllability of obesity may reduce students' own beliefs about obesity. Comparing the attitude change that results from the two types of interventions will inform future educational programming. Integrating effective interventions into the school curriculum will increase the knowledge about obesity for a larger number of adolescents than could occur through individual interventions. If post-measurements of attitude change indicate that elaboration-enhancing presentations are more effective in reducing anti-fat person attitudes, educators can incorporate this approach as they plan their health and physical education curricula.

## **Research Questions and Hypotheses**

The research questions of this study will focus on the extent to which an elaboration-enhancing presentation of information about the controllability of obesity will effectively reduce anti-fat person attitudes in middle-school students. The questions will be addressed with a pre-measurement, post-measurement, and follow-up measurement of anti-fat person attitudes and controllability beliefs.

### **Research Question 1**

Will middle school students who create arguments to persuade others about anti-fat person attitudes experience a greater reduction in their own anti-fat person attitudes than students who have not created such arguments? That is, does elaborating on subjectively positive information in order to formulate arguments designed to change the attitudes of others reduce students' own anti-fat person attitudes more than an intervention that presents information about obesity without any elaboration-enhancing activities?

### **Hypotheses:**

- (1a) There will be a decrease in the endorsement of anti-fat person attitudes from the pre to post measurement in the elaboration-enhancing intervention.
- (1b) There will be no change in the endorsement of anti-fat person attitudes from the pre to post measurement in the information-centered intervention.

- (1c) The post measurement decrease in the endorsement of anti-fat person attitudes will be maintained at a two-month follow-up in the elaboration-enhancing intervention.

### **Research Question 2**

Will middle school students who create arguments to persuade others about obesity controllability experience a greater reduction in their own obesity controllability beliefs than students who have not created such arguments? That is, does elaborating on subjectively positive information in order to formulate arguments designed to change the beliefs of others reduce students' own controllability beliefs more than an intervention that presents information about obesity without any elaboration-enhancing activities?

#### **Hypotheses:**

- (2a) There will be a decrease in the endorsement of beliefs about the controllability of obesity from the pre to post measurement in the elaboration-enhancing intervention.
- (2b) There will be a decrease in the endorsement of beliefs about the controllability of obesity from the pre to post measurement in the information-centered intervention.
- (2c) The post measurement decrease in the endorsements of beliefs about the controllability of obesity will be maintained at a two-month follow-up in the elaboration-enhancing intervention.

(2d) The post measurement decrease in the endorsements of beliefs about the controllability of obesity will not be maintained at a two-month follow-up in the information-centered intervention.

### **Definition of Terms**

The following definitions are provided for the meaning of terms as they are used in the present study.

*Fat.* This term is used as a descriptor for a person who is of larger than average size due to a noticeably higher amount of adipose tissue. It is used interchangeably with the term *Obese* in this study.

*Obese.* Although this term may include individuals who fall in the body mass index category of “obese,” it does not refer only to the medical classification. Rather, it will be used interchangeably with the term *Fat* in this study.

*Anti-fat person attitudes.* This term refers to the negative attitudes people hold toward those they consider obese.

*Controllability beliefs.* This term refers to the beliefs about the etiology of obesity that cause individuals to assume that the condition of obesity is completely within an individual’s control.

## **CHAPTER TWO: LITERATURE REVIEW**

Studies for this literature review were obtained from search results of health and psychology data bases. The searches were conducted using the terms: weight, obesity, weight stigma, stigma, interventions, weight-based teasing, and anti-fat attitudes. References of the obtained articles were also reviewed to ensure a comprehensive assessment of literature from the 1960s to present.

In a review of the psychosocial and health consequences of child obesity, Puhl and Latner (2007) discussed the stigma that is associated with obesity and the degree to which the stress of experiencing it may mediate the health outcomes of childhood obesity. Puhl and Latner noted that the perpetrators of teasing and social marginalization are often the educators, peers and parents of obese children (2007). O'Dea (2000) and other child obesity experts (Brownell et al., 2009) have called for interventions that are effective in both preventing obesity and reducing the stigma that is associated with it. This increased focus on stigma reduction efforts is part of a comprehensive approach that addresses both the individual and cultural factors associated with the problem of child obesity.

## **Obesity and Stigma**

Goffman (1963) conceptualized stigma as occurring from individuals' possession of a characteristic that lowers their social value. He cited some examples of these features, including physical deformities, race, religion, social class, and mental illness. DeJong (1980) suggested that weight should be included in the group of physical attributes that cause stigma, citing the landmark study of Richardson et al. (1961). In this study, children rank ordered pictures of other children according to whom they liked best. The pictures depicted a child with no apparent physical difference, a child with a leg brace and crutches, a child in a wheelchair, a child with an amputated hand, a child with a facial disfigurement, and an obese child. The obese child received the lowest ranking of likeability. Researchers have replicated this study design multiple times. The findings consistently show that children rated obese peers as the least desirable playmate (Bacardi-Gascon, et al., 2007; Latner, Simmonds, Rosewall & Stunkard, 2007; Latner & Stunkard, 2003; Richardson et al., 1961). The rankings for the obese playmate were similar across demographic variables of culture, sex, and ethnicity, forming the foundation of research on obesity stigma.

The presence of negative attitudes toward obese children is accompanied by a high prevalence of weight-based teasing. A 2002 survey of 4746 adolescents across 31 public middle schools and high schools showed that 30% of girls and 24.7% of boys reported that they received weight-related teasing from their peers. Over half of these adolescents reported receiving derogatory comments from their family members as well. The adolescents reported that they found the teasing distressful (Eisenberg et al., 2003).



The multifaceted conceptualization of stigma provided by Link and Phelan (2001) is especially useful in understanding the way that obesity stigma may form the basis for weight-based teasing and discrimination. Building on Goffman's idea of devalued social status, Link and Phelan (2001) suggested a model for the specific social dimensions that form stigma. Link and Phelan conceptualized stigma as an integration of five dimensions: labeling, stereotyping, separation, status loss and discrimination. Labeling is the component of stigma in which people notice differences and then label them. The labels usually do not accommodate the degree of variation that may occur within a group of people who are viewed as different from the rest of society. Rather, the labels tend to identify negative characteristics and generalize them to all people in the group that is different, resulting in the formation of stereotypes. This process of labeling and stereotyping separates people into different categories, resulting in an "us" versus "them" group schema. The "us" (in-group) is generally valued while "them" (out-group) is viewed as fundamentally different and inferior. The negative out-group categorizations results in both status loss and discrimination (Link & Phelan, 2001).

Obesity is an example of a physical characteristic that forms the basis for stigma. As noted by Link and Phelan, labels provide no information about the variation of people within groups. Thus, the label of "fat" does not provide information about the physical and personality variations of individuals who are given that label. Instead, those who are labeled as fat are assumed to equally possess the character stereotypes of being lazy and lacking in self-control. It is important to note that according to Link and Phelan's conceptualization of stigma, the labeling process is a societal construction. Because

people who are obese live in the same society that has concluded that fat people are inferior, they frequently agree with this categorization and the associated negative stereotypes. This agreement with the negative attitudes of the in-group toward one's devalued identity results in a sense of internalized stigmatization (Pierce & Wardle, 1997).

While other minority groups value and support their members, those who are obese often show equally strong or stronger obesity stigma (Monello & Maver, 1963; Schwartz, Vartanian, Nosek & Brownell, 2005; Wang, Brownell, & Wadden, 2004). Thus, they devalue their in-group and are unable to use mutual experience as a factor of social support. Finally, stigmatized individuals may develop a worldview that originates in their identity as a stigmatized person (Crocker, Cornwell & Major, 1993; Link & Phelan, 2001). From this perspective, they view themselves as inferior, of lower status, and without rights to pursue the same opportunities as non-stigmatized individuals.

### **Attribution Theory and Obesity**

The stigmatization of obesity appears to be rooted in people's perceptions that it is caused by character flaws. Attribution theory addresses the tendency for individuals to search out explanations for outcomes and the tendency to attribute negative outcomes in others to internal characteristics such as deficient character. On the other hand, they attribute their own failings to circumstances. A common component of this attribution tendency is the perspective that others get what they deserve because the world is fair. This schema is often referred to as "just world beliefs" and emphasizes individual responsibility for life outcomes (Miller & Porter, 1988). The just world hypothesis

suggests that individuals blame others for their circumstances as a subconscious defense against their own vulnerability to negative life events (Miller & Porter, 1988).

The degree to which obesity is viewed as negative is reflected in research findings. Schwartz et al. (2005) found that 46% of 4283 respondents in an online survey said that they would give up one year of their life to avoid being obese. Thirty percent reported that they would rather be divorced. Thinner people were also willing to sacrifice aspects of health to avoid being obese. This is an interesting finding because health is often used to justify individuals' concern about their weight (T. Cash, personal communication, February 2008). While the belief that obesity can be controlled offers psychological protection for those who fear it, this perspective will decrease empathy for those who are obese because of the perception that they can control it (Miller & Porter, 1988).

Although research indicates a lack of consistent differences in eating behaviors between obese and non-obese persons, obesity is frequently viewed as a consequence of overeating (Kaplen, 1980; Stunkard, Coll, Lundquist & Meyers, 1980; Wooley, Wooley, & Dyrenforth, 1979). Thus, obesity is viewed as an outcome that people can control and for which they are responsible. The condition of an obese person is viewed as evidence of laziness and a lack of self-control (Crandall, 1994; Miller & Porter, 1988)

**Research on control attributions of obesity.** In order to assess the effect of control attributions on anti-fat person bias, Maddox (1968) conducted a replication of Richardson's 1961 study with a stratified, random sample of students. After he acquired student ratings on the pictures, he asked them to state whether they thought that the

individuals portrayed were responsible for their physical conditions. He also asked whether this judgment had affected their liking of the individual. Results showed that the more students' believed obese individuals were responsible for their condition, the less they reported liking the obese individuals portrayed.

To further test the relationship between attributions of individual control and anti-fat person attitudes, Lewis and Cash (1997) had students read information that emphasized behavior that might reduce obesity, such as exercise and dieting. Another group read information that emphasized the genetic etiology of obesity. Those that read information that emphasized aspects of individuals' behavior endorsed more items that reflected blame of obese individuals for their condition. A similar study that assessed the effect of providing information about behavioral aspects associated with obesity (i.e., overeating and lack of exercise) on the strength of implicit anti-fat person attitudes showed higher anti-fat person attitudes in students who had received this information than those who did not receive it (Teachman, Gapinski, Brownell, Rawlins & Jeyaram, 2003).

Another study of control attributions assessed the degree to which perceptions of controllability affected character ratings of obese adolescents portrayed with or without a thyroid problem (DeJong, 1980). DeJong conducted two studies in which he varied the amount of health information, the level of self-disclosure, and the degree to which a girl described herself in a derogatory manner. Results indicated that obese girls without a medical explanation for their condition received more highly negative character ratings than those who provided a medical explanation. Specifically, girls who did not provide

medical explanations were viewed as more self-indulgent and without self-discipline. The perceptions of character deficits and lowered social value as reflected in this experiment result in the status loss that results from stigma (Goffman, 1963; Link & Phelan, 2001).

**Cultural messages about obesity.** In addition to the research evidence of the control attributions associated with obesity, modern media confirms the presence of these attributions. For example, *The Today Show*, a popular morning show on the NBC network, regularly hosts a segment about weight-loss dietary strategies and the personal success stories of those who have lost weight. The popular reality show, *The Biggest Loser*, relies on the concept of reduced caloric intake and multi-hour exercise regimens as effecting weight-loss. In post-show disclosures, some of the Biggest Loser contestants talked about their use of laxatives, fasting and other unhealthy behaviors to maximize their weight-loss as well as their struggle with weight regain at the completion of the show.

The cultural message that one can achieve a socially desirable weight with hard work permeated the diet fads of the 1800s (Segrave, 2008). The emphasis on diet fads continued into the present, with variations on carbohydrate restriction (e.g., Atkins, South Beach), fat restriction (e.g., Susan Power's Stop the Insanity), and "gluttony" restriction (e.g. Weigh Down Workshop). A review of participants in the National Weight Control Registry, a database of individuals who have successfully maintained some degree of weight loss, indicated that significant weight loss was difficult to maintain (Wing & Hill, 2001). Wing and Hill suggested that a 10% reduction in weight that is maintained for at

least a year should be viewed as a success. They noted that while this reduction may increase health status, it may not be enough to shift people from obese to non-obese classifications. This view of weight-loss success contradicts that of the modern diet industry which reinforces the belief that people can reach any desirable weight if they have the self-discipline to adhere to the diet prescribed. Taken together, the message that weight is completely within a person's control reinforces the stereotype of fat people as lazy and undisciplined individuals with marginal social value.

The conceptualization of stigma as culturally constructed and the ubiquitous nature of obesity stigma in Western culture raises questions about its transmission to children. Do children show anti-fat person attitudes? If so, at what age does it manifest itself? The following review of empirical studies related to anti-fat person attitudes in children substantiates its presence and will provide a rationale for the need to test which intervention strategies most effectively reduce this stigma.

### **Obesity Stigma in Children**

#### **Anti-fat Person Attitudes**

**Devaluing obese peers.** Following the 1961 study in which the obese child was ranked as least likeable (Richardson et al), a number of studies have assessed the social status of obese children. Across measures of bias and variations in target stimuli, children consistently preferred pictures of children with average or thin body builds (e.g. Brylinsky & Moore, 1994; Greenleaf, Starks, Gomez, Chambliss & Martin, 2004). They also expressed that they did not want to look like chubby children (Lerner & Gellert, 1969).

**Endorsement of stereotypes.** In addition to the studies that show devalued social status, research also shows that children hold stereotypes of fat peers. Some frequently endorsed stereotypes of obese children are that they are lazy, sloppy, and unintelligent (Anesbury & Tiggemann, 2000; Counts, Jones, Frame, Jarvis & Strauss, 1986). Kraig and Keel (2001) found that children assigned more positive attributes to average or thin body builds compared to chubby ones. For example, ratings on both social characteristics (i.e., attractive, polite, popular) and physical characteristics (i.e., strong, healthy) were negative for chubby children. Ratings were positive for average-sized children and mixed for thin children.

Lawson (1980) found that the negative stereotypes reflected in research findings do not affect children's attitudes toward real-life, obese classmates. She did not find that students applied fat stereotypes toward their classmates even though they had strongly endorsed them in paper-based questionnaires. Lawson concluded that the endorsement of stereotypes in figure drawings does not apply to real-life contexts. While these results provide a basis for questioning the relationship between broad-based stereotypes and the perceptions of specific individuals, the study did not cite the number of obese classmates that were present in the sample size of 84 students. Personality factors of both students and classmates may have affected the application of negative qualities to specific individuals. Additionally, her results may have been vulnerable to social desirability bias because children individually wrote the names of those they thought fit the stereotypes while an adult volunteer watched them.

## **Anti-fat Behaviors**

**Willingness to engage.** In addition to assessing the devaluation and stereotypes of fat children, researchers have tried to determine the degree to which anti-fat person attitudes will affect children's willingness to engage with peers who are obese. Results of a study of 274 Hispanic and White adolescents indicated that endorsement of weight-related stereotypes predicted less willingness to engage with overweight peers in academic, social, and recreational settings (Greenleaf et al., 2006). Another study using the same behavioral measure reflected age differences in behavioral intentions such that younger were less likely to engage with obese children in recreational settings. Older children were less likely to engage academically. Additionally, older children showed a lower degree of willingness overall to engage with obese peers than did younger children (Bell & Morgan, 2000).

Another way of assessing the relationship between obesity and willingness to engage is the use of friendship nominations. This allows a researcher to compare behavior directly with self-reports or indirectly by checking for reciprocity in nominations, (i.e., Sally says Jenny is a friend, and Jenny says Sally is a friend). Strauss and Pollack (2003) used this technique with 90,118 adolescents to assess whether the anti-fat person attitude studies would be reflected in real social networks. They asked students to list their five best friends of each sex. Results indicated that children listed obese peers as friends much less often than they listed non-obese peers (Strauss & Pollack; 2003). A 2008 study that included 2278 students (Crosnoe et al., 2008) replicated these findings such that obesity was related to fewer friendship nominations.



This relationship remained after accounting for other factors that might affect friendships such as characteristics of emotional distress or academic achievement. In addition to the studies that have verified the presence of social marginalization of obese children, a number of researchers have assessed the presence and consequences of overt behavior such as teasing and bullying.

**Weight-based teasing.** Results of studies on weight-based teasing in children's school and home environments indicated that teasing accounts for more variance in psychosocial functioning than differences in body weight alone (Eisenberg et al., 2003; Faith et al., 2002; Griffiths et al., 2006; Haines et al., 2006; Lewin, Geffken, & Silverstein, 2007; Storch et al., 2007). Some results indicate that this teasing is the mediating variable between obesity and the psychosocial issues that are frequently associated with overweight status (Thompson, Covert, Richards, Johnson & Cattarin, 1995).

As with other areas of literature, the research on the associations between body mass index and teasing have evolved from simple to more complex designs. Early studies yielded correlations from cross-sectional samples. These studies provided information about the presence of psychosocial problems in obese children but did not provide an explanation of the pathways between body mass and these difficulties. Longitudinal designs, predictor models, and covariate structural modeling affords a clearer picture of the pathways between the variables assessed. Teasing appears to be a primary mediating variable that accounts for the association between obesity and multiple psychosocial problems. The most frequent problems associated with obesity in

adolescents include higher rates of depression, peer victimization, food restraint, binge behavior, poor body image, suicidal ideation and suicidal attempts (Anderson, Cohen, Naumova, Must, 2006; Davison et al., 2003; Eaton, Lowry, Brener, Galuska & Crosby, 2005; Janssen et al., 2004; Pesa, Syre, & Jones, 2000).

Eisenberg et al. (2003) investigated the link between obesity and several of these psychosocial problems. Results showed that weight-based teasing was associated with decreased self-esteem, decreased body satisfaction, increased depressive symptoms, increased suicidal ideation, and increased suicidal attempts. The relationship between teasing and these outcomes was not affected by body mass index, sex, school level and race. Several additional studies looked specifically at the relationship between weight-based teasing and depression. Teasing predicted depressive symptoms in a sample of children ranging in age from 8-18 years old (Storch et al., 2001). Young-Hyman et al. (2006) found this same predictive relationship between weight-based teasing and depression. Their study also showed that depression was associated with reports of body size dissatisfaction in models using all students, only girls, or only White students. The relationship between body dissatisfaction and depression may explain the findings from a national, representative Youth Risk Survey ( $N = 13601$ ) that showed body dissatisfaction as a full mediator between body mass index and suicidal risk (Eaton et al., 2005). Because of the relationships among depression, teasing and body dissatisfaction, the relationship between teasing and body dissatisfaction warrants closer scrutiny.

To what extent is perception of body weight and body dissatisfaction associated with a person's history of experiencing weight-based teasing? Lunner, Werthem,

Thompson, Paxton, McDonald, and Halvaarson (2000) used path modeling to analyze the relationships between body mass index, teasing, and body dissatisfaction of 629 Swedish and Australian adolescents. Path analyses of three samples showed that body mass predicted both body dissatisfaction and teasing. Teasing was also a separate predictor of body dissatisfaction. A similar pattern occurred with the use of covariance modeling in the longitudinal study of 210 adolescent girls (Thompson et al., 1995). Results showed that teasing history fully mediated the association between body mass index and body dissatisfaction across a series of three studies.

In addition to predicting depression and body dissatisfaction, a history of being teased about weight appears to predict the development of both restrictive eating patterns and binge eating behaviors. A five-year-longitudinal study of 2516 adolescents assessed this association after controlling for age, race, socioeconomic status and body mass index. Boys who were teased were more likely to binge eat and engage in unhealthy weight control behaviors (e.g., skipping meals) at the five-year follow-up. The prevalence of this behavior was 4.1% in those who were teased compared to 1.4% in those who were not teased. Girls who were teased were more likely to engage in restrictive eating, a behavior that predicted bulimia in two of the studies from Thompson et al (1995). Taken together, these studies indicate that teasing leads to body dissatisfaction with leads to higher risk for eating disturbance

In addition to the development of unhealthy eating patterns, teasing is also predictive of loneliness and decreased physical activity (Storch et al., 2007). Results of a study of 576 adolescents indicated that teasing reduces both the enjoyment of physical

activity as well as participation in it (Faith et al., 2002). Furthermore, 72% of the children who experienced teasing said that they were excluded from sports and games because of their body size.

The research on the effect of being teased shows a complex but consistent picture of its negative consequences. Variations across studies show some differences in prediction patterns. Sample sizes and research methods varied in each study. Despite these differences, the relationship between teasing and psychosocial distress was consistent across results. All analyses showed an association between being teased and decreased self-esteem, decreased body satisfaction, increased depressive symptoms, increased suicidal ideation, and increased suicidal attempts. Depending on the study design, teasing was a correlate, a predictor, a partial mediator or a full mediator. Thus, the adverse consequences of teasing are not simply an artifact of one type of design or sample group.

### **Demographic Variables Influencing Anti-fat Person Attitudes and Teasing**

**Body mass index.** Body mass index, the measure that assesses levels of obesity, is usually not associated with the strength of anti-fat person attitudes and stereotyping (Counts et al., 1986; Kraig & Keel, 2001; Anesbury & Tiggemann, 2000). In fact, the results that did show associations indicated that those who are obese have more negative attitudes toward obese targets and endorse stereotypes more strongly. The researchers did not assess whether they also teased obese peers.(Cramer & Steinwert, 1998). Obese adolescents' endorsement of anti-fat person attitudes is consistent with the construct of

internalized stigma in which people adopt the culture's negative attributions related to their devalued characteristic.

While body mass is not associated with the strength of anti-fat person attitudes, it is consistently associated with the degree to which children are the targets of weight-based teasing and social marginalization. Across studies, children and adolescents in the overweight or obese body mass index categories experienced more weight-based teasing than those of average weight (Faith et al, 2002; Griffiths et al, 2006; Jackson, Grilos, & Masheb, 2000; Janssen et al., 2004; Lunner et al., 2000; Sweeting & West, 2001) . At the same time, the correlation between body mass index and teasing does not appear to be completely linear. Results of one study in which all children were very obese did not reflect a relationship between BMI and the amount of teasing, possibly indicating a ceiling effect for children with very high body mass indices (Storch et al., 2007). Some results show that underweight children experienced weight-based teasing, but the percentage and frequency of teasing is lower than that of overweight and obese children (Neumark-Sztainer et al., 2002).

**Ethnicity and Race.** The cultural variation in attitudes toward body size and obesity is an area of research that has generated numerous studies. This demographic variable will not be a primary focus in this study, yet it is helpful to review literature in order to counter a frequent misperception that obesity stigma occurs only in White populations. Some studies have indicated cultural variations in body type norms or individual satisfaction with body size (e.g. Kemper, Sargent, Drane, Valois & Hussey, 1994). On the other hand, general endorsement of anti-fat person attitudes and weight-

based teasing has been reported in diverse samples, including students who identified as Hispanic-American, White-American, African-American, Mexican, Australian, and Swedish. (Bacardi-Gascon, et al, 2007; Greenleaf, Chambliss, Rhea, Martin, & Morrow; 2006; Latner et al., 2007; Lerner et al., 1975; Lunner et al., 2000; Neumark-Sztainer, Story, & Faibisch, 1998). One study on the hurtfulness of teasing included African-American girls and White girls in equal proportion. The African-American girls reported the same distress as White girls and noted that the teasing about weight hurt more than comments about their race (Neumark-Sztainer et al., 1998).

**Sex.** Anti-fat person attitudes and stereotyping exists across both sexes in all studies (e.g. Cramer & Steinwert, 1998; Anesbury & Tiggemann, 2000). There were no consistent differences in the strength of the anti-fat person attitudes between girls and boys. The results of some studies indicate that one sex characterizes overweight children more negatively while other studies report the opposite pattern (Kraig & Keel, 2001; Latner et al., 2007).

While both sexes reported weight-based teasing (Janssen et al, 2004; Kraig & Keel, 2001), the problem affects a higher percentage of girls than boys (Eisenberg et al., 2003; Faith et al., 2002; Griffiths et al., 2006). The frequency of teasing episodes is also higher for girls. Some findings indicated that boys teased more often than girls (Griffiths et al., 2006). Girls agreed. They reported that they were teased more often by boys than by girls (Neumark-Sztainer et al., 2002). Although negative psychosocial outcomes of weight-based teasing were present for both sexes, the psychosocial consequences seemed

to be stronger for girls than for boys (Neumark-Sztainer et al., 2002; Young-Hyman et al., 2006).

**Age.** Results of one study indicated that three-year-olds have negative perceptions of fat. The sample included 83 children ranging from three years old to five years old. Children listened to several simple stories that included nice and mean characters. Following the stories, the children looked at ink and colored drawings and pointed out the figures which they thought represented the nice or mean characters of the story. The children were then asked why they had chosen a figure as being nice or mean. Their responses were coded according to whether they made explicit mention of weight, general aspects of body size, other aspects of appearance, thoughts about what characters had done in the story, and “don’t know” responses. Following this task, children were presented with lists of adjectives and asked to point to the figure that they thought represented that adjective. Finally, they were asked to identify the figures they would prefer as a playmate.

Results of the study showed that boys and girls of all ages were more likely to identify the chubby figures as being mean across all stories. The analysis of their explanations showed that four-year-olds used appearance and body size to explain their figure preferences. Five-year-olds shifted to explicitly talking about fat or thin body sizes. The results of the adjective task showed that three-year-olds attributed more negative adjectives to chubby figures than thin figure. This pattern became stronger for four-year-olds who attributed more negative adjectives than three-year-olds. Five-year-olds identified the most negative adjectives and used fewer positive adjectives to describe

chubby figures than did the two younger age groups. Children across age categories equally preferred a thinner figure as a potential playmate (Cramer & Steinwert, 1998). Both this study and others showed that fat stereotypes tend to strengthen with age (Bell & Morgan, 2000; Cramer & Steinwert, 1998; Brylinsky & Moore, 1994; Lerner et al., 1975). This increase in anti-fat person attitudes may account for results that indicated a worsening of teasing and psychosocial problems in longitudinal studies (Davison et al., 2003; Janssen et al., 2004).

### **Interventions to Reduce Obesity Stigma**

Despite the large amount of literature on weight-based social marginalization and teasing, intervention efforts for obese children and adolescents continue to focus on weight reduction. Children and adolescents hold anti-fat person attitudes regardless of their own body size, sex, or race. The teasing and social marginalization that is associated with these anti-fat person attitudes is related to decreased self-esteem, decreased body satisfaction, increased disordered eating patterns, increased depressive symptoms, increased suicidal ideation, and increased suicidal attempts. Thus, it is crucial that researchers move from confirming the presence of anti-fat person attitudes to finding ways to reduce them.

### **Medical Model**

In accordance with the medical model of intervention, researchers have attempted to reduce the effects of obesity stigma by advocating for weight reduction efforts (Friedlander et al., 2003; Hesketh et al., 2004). Obesity stigma and its consequences to self-esteem are often included in the list of consequences to childhood obesity. Thus,



some individuals use the psychosocial consequences of obesity stigma to substantiate the need for prevention of childhood obesity rather than separately addressing obesity stigma as a cultural problem. Within this medical model, healthcare professionals recommend weight-loss as the primary intervention to address the consequences of obesity stigma. Several research articles that include commentary on the psychosocial consequences of obesity stigma conclude by calling for increased weight-loss intervention programs to prevent or ameliorate the psychosocial stress of children who are obese (e.g. Hesketh et al., 2004). Because of the individual emphasis, this perspective reinforces controllability attributions related to obesity and decreases the responsibility of the culture for marginalizing those who are obese.

### **Attitudinally Based Interventions**

**Control Attributions.** Some intervention studies have assessed whether providing medical explanations for obesity may reduce individuals' perceptions that weight is completely within a person's control and that fat people are lazy and self-indulgent. Bell and Morgan (2000) conducted a study investigating the degree to which medical explanations would affect children's attitudes toward obese peers and their willingness to play with them. One hundred eight-four students in third through sixth grade viewed videos of children who appeared to be of average weight or obese. The obese conditions included presentations by a child presenter who wore a "fat suit." A "fat suit", or padded costume that retains facial features but adds additional body weight, ensured that other appearance characteristics were constant across conditions. In one condition, the child provided medical explanations for obesity while no explanations

were provided in the other condition. In assessing the effect of a medical explanation on attitudes, results showed that children in fifth and sixth grade viewed the obese child presenter negatively regardless of whether the child provided a medical explanation. On the other hand, analyses showed that a medical explanation did result in ratings that were more positive from children in third and fourth grade. The results related to the children's willingness to engage with the obese child presenter showed that younger children were less likely to engage in recreational activities, regardless of whether a medical explanation was offered. On the other hand, older children reported being less likely to engage in academic activities with an obese child who had a medical condition. Although there is not a literature base available to explain the differences in engagement according to activity, the more positive ratings from younger children when given a medical explanation may reflect more flexible beliefs about obesity. This explanation would be consistent with the literature that shows age-related increases in anti-fat person attitudes (e.g. Cramer & Steinwert, 1998).

Another intervention study focused more directly on changing controllability beliefs as a method of affecting attitudes. The belief that fat individuals can control their weight may contribute to the laziness stereotype because of the perception that they are choosing not to change their situation. Anesbury and Tiggemann (2000) attempted to reduce negative stereotyping by changing controllability beliefs in 74 upper elementary school children. The students watched a 10-minute, simply worded presentation accompanied by pictures. The presentation focused on the uncontrollability of size. Results indicated that while the controllability beliefs were lower than those reported

prior to the intervention, the pre- and post- reporting of fat stereotypes remained the same. Although the short presentation style may be appropriate for the attention span of younger children, it may have limited the thought rehearsal associated with changes in cognitive structure. Alternately, the content may have lacked the personal relevance that would help increase children's motivation to process the information (Petty, Heesacker, & Huges, 1997).

Three studies of anti-fat person attitudes in adults assessed the effectiveness of providing information about the genetic etiology of obesity (Crandall, 1994; Lewis & Cash, 1997; Teachman et al., 2003). Crandall provided persuasive messages about genetics and metabolism to college students. After hearing the messages, students received a fact sheet summarizing what they had heard. Students who read these messages endorsed fewer beliefs about the controllability of obesity and scored lower in anti-fat person attitudes compared to a control group which had not received this information. Lewis and Cash (1997) conducted a similar intervention to that of Crandall but did not provide the additional fact sheet following the presentation of the persuasive message. They found that providing information about individual behavioral differences in eating or exercise increased control attributions and anti-fat person attitudes. On the other hand, providing information about the uncontrollable aspects of obesity did not reduce anti-fat person attitudes. Lewis and Cash (1997) suggested that the intervention may have been too brief to result in positive attitude change. Teachman et al (2003) also found that providing information about the uncontrollable aspects of obesity did not lower the anti-fat person attitudes of college students. They speculated that students may

have viewed the obesity uncontrollability information as less creditable or had pre-existing strong beliefs that caused them to discount the research presented.

**Emphasis on weight acceptance.** An intervention study that emphasized weight-acceptance used a puppet show to decrease anti-fat person attitudes in elementary-aged children. Several puppets of different sizes were used to present a story. The story emphasized the importance of accepting diverse body sizes, enhancing self-esteem, and holding healthy attitudes about food (Irving, 2000). The presentation of the puppet show was 20 minutes long. The class asked questions to the puppets for another 10-20 minutes, but the content of these questions was not reported. Students ( $N = 152$ ) completed an evaluation of the puppet show that asked questions about their favorite puppets, their favorite components, and the lessons they had learned. Younger children were more likely to report that they had learned not to tease whereas older children perceived the message to be general kindness toward others. Forty-five girls from the sample completed a questionnaire on body size and adjective descriptors either before or after the show. The girls who completed the questionnaire after the show endorsed more positive ratings of larger body size related to cuteness, having friends, and work ethic than those who completed it before the show. Some methodological issues of the study included an uneven number of puppets representing each sex and the small cross-sectional design with which researchers assessed pre-post measures of attitude. These methodological issues prevent the ability to draw strong conclusions about the intervention's effectiveness in reducing anti-fat person attitudes. At the same time, it is

the first intervention that facilitated processing of the information by allowing the children to ask questions to the puppets (Irving, 2000).

**Perceived social consensus.** According to Stangor and Crandall (2000) consensus about stereotypical beliefs develops from interactions with in-group members. In order to investigate how providing information about the attitudes of other group members might affect one's own perceptions, Puhl et al. (2005) conducted a series of three studies on social consensus. The attitudes of respondents were more positive toward obese people if they received information that led them to believe that the attitudes of others from their own group were positive toward obese individuals. In addition, those who received information about the attitudes of others in their in-group (students from same college) shifted their own attitudes to a greater degree than those who received information about the attitudes of out-group individuals (students from a different college). Finally, Puhl et al. compared the influence of providing information on social consensus with providing information about the uncontrollability of weight. While receiving information about the uncontrollable aspects of weight decreased endorsement of negative descriptors about obese individuals, it did not increase endorsement of positive descriptors. On the other hand, the social consensus group endorsed characteristics of obese individuals that were more positive. They were also more likely to endorse external factors that might affect weight. Together, these interventions suggest that a combination of providing information about obesity and addressing the social framework that supports stigma may be beneficial in helping to reduce anti-fat person attitudes.

### **Limitations of Interventions**

Two primary limitations to the interventions above may have affected the degree to which they were effective in decreasing anti-fat person attitudes. First, the information about the etiology of obesity may have been perceived as a weak argument, thus reducing the central route processing necessary for attitude change. Secondly, the interventions consisted of brief sessions with little opportunity to manipulate the information presented. Even if the information was perceived as credible, the lack of opportunity for manipulation may have reduced message encoding (Reisberg, 2007). The differences in presentation lengths, frequency, and manipulation may have interacted with the types of intervention to produce the mixed patterns of results. Manipulation of information is a factor that appears to affect not only information encoding but also the likelihood of attitude change.

### **Using Attitudinal Literature to Inform and Improve Interventions**

#### **Elaboration Likelihood Model**

A well-known model of attitude change is the Elaboration Likelihood Model (Cacioppo et al., 1991). According to this model, people use two methods to process attitude relevant information: the peripheral route and the central route. The processing route used is determined by characteristics of the message recipients and their psychological state. If the recipient is neither motivated nor able to process the fundamental arguments of the message (i.e., centrally processed), the peripheral route will be used. Peripheral processing does not involve thoughtful consideration of the message. Instead, the context of the message serves as a cue for evaluating the message.

Many factors serve to define a message's context. Some examples involve subjective liking of the communicator, his or her attractiveness, frequency of the presentation, and the media used to present the message (Cacioppo et al., 1991).

By contrast, central route processing involves effortful consideration of the validity of the message. Although recipients can shift their opinions or attitudes through either route of processing, the central processing route is associated with sustained attitude change and is more likely to result in behavioral change (Cacioppo et al., 1991). Conversely, attitude shifts resulting from peripheral cues tend to quickly return to their original status. While it is necessary to understand the differences in the two routes of processing, it is important to note that the presence of one form of processing does not exclude the other. For example, sources that are credible or attractive may motivate recipients to pay closer attention to the message presented, thereby engaging central route processing. Similarly, individuals may critically evaluate the message content but may be more likely to evaluate it in a positive manner if they are in a good mood during the presentation of the message (Cacioppo et al., 1991).

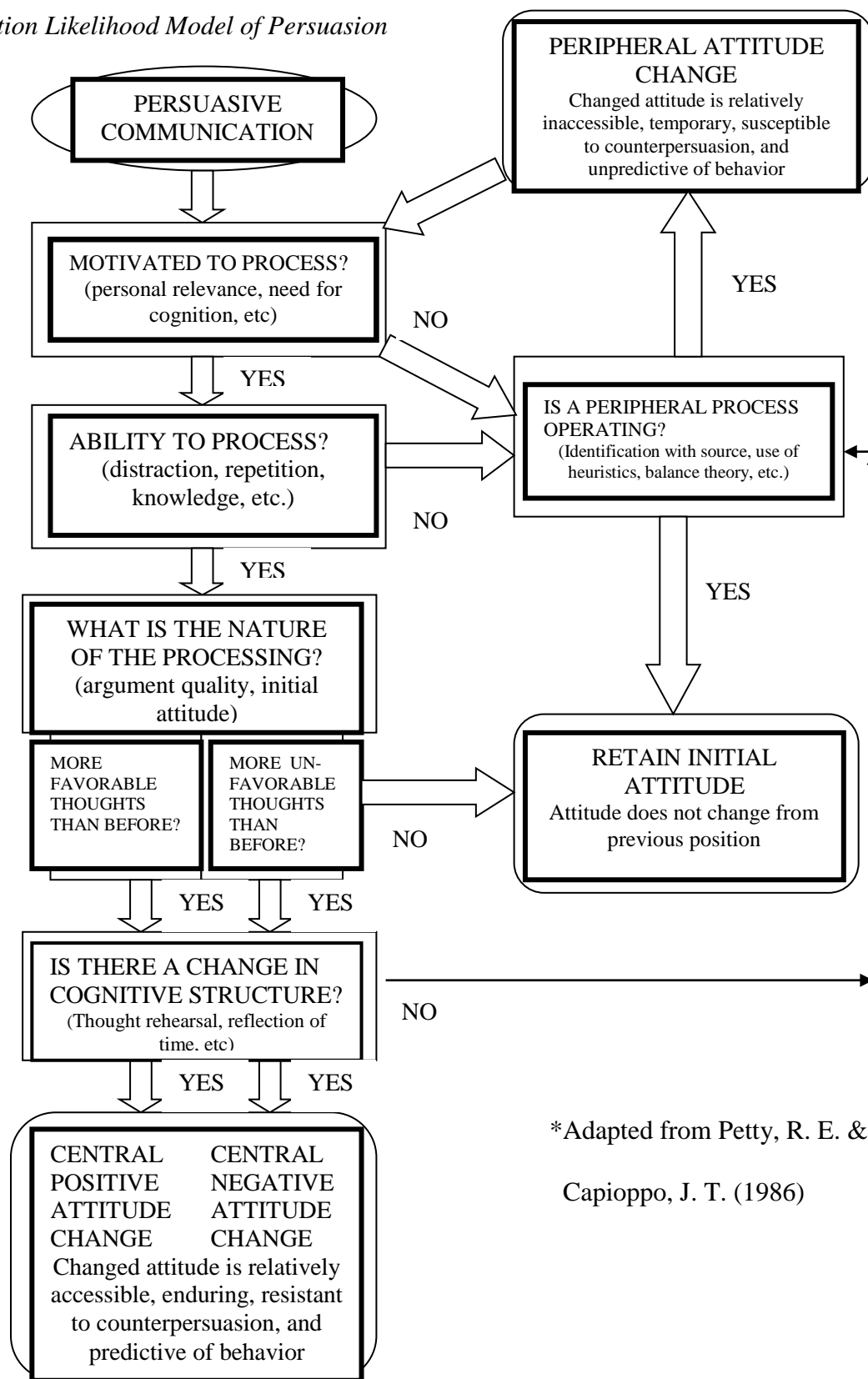
Because central route processing is associated with attitude change that is lasting, resistant to counterarguments, and associated with behavioral change, integrating the conditions that foster positive attitude change is crucial to interventions. Recipients who are both motivated and capable of evaluating message information are much more likely to be influenced by central route processing rather than the peripheral route (Cacioppo et al., 1991). Thus, if students do not have a reason to attend to the information presented or the information is confusing, they will be less motivated to assess the information

using the central route. Motivation is also affected by one's involvement with the message. This involvement may occur because the message is viewed as personally affecting the recipient, interesting, pertaining to one's values or convictions, or necessary for later task achievement or decision-making (Hallahan, 2005). Students may become involved in messages they perceive as negative or contradictory to their personal values. In such cases, central route processing may occur but result in an enduring negative attitude change rather than a positive one. Thus, it is especially important to ensure that recipients will view the message as credible, compelling and positive before facilitating central route processing.

Cognitive processing or involvement may decrease according to the number of persons responsible for evaluating the argument. Petty, Harkins and Williams (1980) found that when individuals evaluated arguments as part of a group, they used less cognitive effort than when they were individually responsible for evaluating the argument. This finding corresponds with those of Robbins (1995) who found that social loafing occurred on cognitive tasks that were completed in groups, even when the tasks were interesting and personally relevant. Thus, the conditions that maximize central route processing and positive attitude change are those that facilitate perceived relevance, a positive subjective evaluation of the message, comprehension of the message, and individual responsibility to think about and respond to the message presented. Figure 1 shows the integration of these components into the central and peripheral processing pathways.



Figure 1

*Elaboration Likelihood Model of Persuasion*

**Empirical validation of elaboration likelihood.** Several studies have integrated the elaboration likelihood model into efforts to change individuals' attitudes on a variety of subjects. Ernst and Heesacker (1993) incorporated components of the model in order to fill a gap in the effectiveness of assertiveness training workshops. According to Ernst and Heesacker, previous studies had shown that while workshop attendees' had increased their knowledge and skills related to assertiveness, they remained hesitant to implement the assertiveness skills in daily living. Ernst and Heesacker added components of the elaboration likelihood model to one of the workshops to investigate whether this focus on attitude change would help to close the gap between knowledge and action. They specifically focused on increasing motivation by asking students to think about incidents in which failure to assert themselves had resulted in negative ramifications. The researchers addressed the ability and memory consolidation aspects of the elaboration likelihood model by asking the students to recall thoughts they had during the workshop. Additionally, the researchers presented positive arguments for behaving assertively. In comparing the actions of attendees who had participated in the elaboration-enhancing assertiveness workshops with those from a traditional workshop, Ernst and Heesacker found that participants in the elaboration-enhancing condition reported attitudes that were more positive about assertiveness and that their roommates reported observing more assertive behaviors at a 2-week follow-up.

In a study that assessed the use of the elaboration likelihood model for changing attitudes about electronic health care records, Angst and Agarwal (2009) participants were assigned to two argument conditions. One argument was neutral while the other was

designed to induce positive attitudes toward electronic health records. Participants completed an online survey related to concerns for privacy and attitudes toward electronic health records. In order to assess the level of issue involvement, researchers obtained information about the frequency with which students utilized health services. The researchers addressed the component of “ability” in their experiment by keeping the arguments simple to increase comprehensibility. The results of the study were consistent with the elaboration likelihood model. Results showed that the message argument did not significantly affect attitude change for participants who were less involved with the issue, but the credibility of the source (peripheral route) did yield attitude change. For those who had higher involvement with the issue, the content of the message was more important in changing attitudes because more elaboration occurred. It should be noted that participants may have not had pre-existing strong attitudes against electronic records, reducing the potential for counterarguments and increasing the likelihood that the new information would facilitate positive attitude change.

Another study assessed the utility of integrating the elaboration likelihood model to facilitate attitude change about body image with adolescents with eating disorders (Withers & Wertheim, 2004). The researchers compared the amount of attitude change that occurred in information-centered and elaboration-enhancing conditions. Attitudes assessed in the experiment were the drive for thinness, perception of one’s own body size as acceptable, and attitudes toward dieting. Adolescent females watched a videotape about eating disorders. Following the video, some of the participants worked in groups to complete verbal and written activities related to the video content (Withers & Wertheim,

2004). Although the video intervention was more effective in changing attitudes than the control condition (no intervention), results reflected no difference between the information-centered and the video with elaboration-enhancing activities. Researchers suggested that the video, designed to change attitudes, might have resulted in the maximum attitude change possible. The researchers noted that girls had heard many of the messages in the video previously such that the elaboration exercises that focused on the information itself might have simply added redundancy rather than additional persuasive power. The researchers also investigated variables related to students' need for cognition, personal relevance to the information presented, and own body size; however, these variables did not affect the overall outcomes related to elaboration effectiveness.

A strategy that focuses more directly on facilitating the critical analysis of a message is that of counter attitudinal advocacy. Widgery & Miller (1973) asked students to persuade others to take an attitude that was different from the one they actually believed. The researchers presented the students with the idea that a national policy should mandate military service for all men prior to their acceptance into a university. Students constructed a persuasive argument that was contradictory to their own beliefs on the subject. Widgery & Miller's results showed that the strategy was most effective if people were persuading a known audience who they did not perceive as committed to either position. In persuading others, the person formulating the argument must deduce the counterarguments of the opposing side and address them. This process involves more critical thinking and message manipulation than the written or verbal exercises that

Withers and Wertheim (2004) used in their video elaboration exercises. Thus, integrating the video presentation of information with an elaboration task that requires critical thinking in order to persuade others may be a more successful strategy of facilitating attitude change.

One web-based study used the components of the elaboration likelihood model to assess the most effective interventions in changing attitudes toward obesity (Hague & White, 2005). Researchers assigned the future teachers to one of four web-based education modules promoting acceptance of large-sized individuals. The modules were the same for each treatment condition, with each containing 13 web pages intended to facilitate learning in a self-paced format. The groups included a control condition, an educational module only, a module with exposure to the credentials of the presenter, and two modules that included the credentials of a “fat” or “non-fat” picture of the presenter. Researchers created two pictures of the same presenter by altering the image electronically so that one appeared 20% larger than the other. Negative attitudes decreased following the intervention and remained stable at six-week follow-up in all treatment groups, but those who had viewed the credible “fat” source showed a more positive change in attitudes than those who viewed the credible “non-fat” source. Although results partially supported the elaboration likelihood model in that the source perceived as more trustworthy resulted in higher amounts of attitude change, attitude did not change according to measures of motivation or ability, as the elaboration likelihood model predicts. The sustained outcome indicates that central processing occurred, and

the multiple web pages, self-paced format may have provided the mental elaboration that is the main component of central route processing.

### **Application of the Elaboration Likelihood Model to Obesity Stigma Reduction Interventions**

Consistent with stigma theory, attitudes about obesity are deeply entrenched in many individuals because the stigma is both culturally constructed and continuously reinforced. The elaboration likelihood model provides a guide for presenting information to counter controllability beliefs under the conditions that are most likely to facilitate attitude change. The specific interventions can be tailored according to the age or cultural differences of the treatment group, as long as they have high source credibility, a subjectively positive message, and individuals who are capable of elaborating on the message and motivated to do so. Integrating all of these components will maximize the potential for positive attitude change in stigma reduction interventions.

One of the main consequences of obesity stigma is the psychosocial distress that results from teasing and social marginalization of children who are obese. Although there are many variables that affect the extent to which attitude predicts behavior, Fazio (1990) suggests that attitudes are better predictors of behavior when they are cognitively accessible, internally consistent, and strongly held. The elements of critical thinking and involvement that facilitate central route processing increase the strength and accessibility of new attitudes. Thus, this type of attitude change toward individuals who are obese might increase the likelihood of reducing teasing and social marginalization of obese peers.

One of the limitations of some intervention and prevention efforts is that the credibility of the instructor may strongly affect the amount of attitude and behavioral change in adolescents (Stephens et al., 2009). By focusing on the characteristics that facilitate central route processing, researchers can increase the potential that interventions will be effective despite variations in the attractiveness of the source. Intervention efforts which use video presentations designed for specific populations or age groups can maximize inclusion of the elaboration likelihood model components while minimizing the effect of instructor credibility.

In designing stigma reduction efforts for adolescents, using the information about credibility, motivation to process, and processing ability will provide a framework for choosing the characteristics of an intervention that will be most appropriate. For example, while providing information from adult experts will be important, presentation of information by a same-aged peer may increase source credibility for secondary students. Providing an intervention that is appropriate for the grade level and facilitates student involvement will increase the potential for central route processing and ensure that source credibility is not the only factor that affects attitude change.

### **Summary**

As the rates of obesity rise, it is likely that more children will experience the adverse health and psychosocial consequences that occur from obesity stigma. Not only is there an increase in the number of obese children, but the severity of obesity stigma is getting worse. Using the same methodology as the original 1961 study of Richardson et al., Latner and Stunkard (2003) found that the difference in liking preference for an

average weight child versus an obese child has increased by 40% since 1961. A comparison of the prevalence in perceived weight discrimination in the United States showed a 66% increase between 1996 and 2006 (Andreyeva et al., 2008). The stigma of obesity has been compared to the stigma of race, and some evidence shows equivalent psychosocial consequences (Monello & Maver, 1963; Puhl et al., 2008). Thus, interventions studies are the next logical step in research.

In accordance with the multifaceted conceptualization of stigma, it is necessary to have a multifaceted intervention approach. The existing intervention research has tried to reduce fat stigma by changing controllability beliefs (the attribution component of stigma) or the perception of social consensus (the cultural aspect of stigma). Although controllability beliefs decreased in the studies that provided medical explanations of obesity, attitudes and stereotypes held about fat people did not change (Bell & Morgan, 2000; Anesbury & Tiggemann, 2000). In another study, providing information on the etiology of obesity resulted in fewer negative endorsements of fat attributes but did not increase the number of positive ones (Puhl, Schwartz, & Brownell, 2005). Thus, changing controllability beliefs may be a necessary but not sufficient strategy for changing attitudes that contribute to stigma. Social consensus information was effective in changing both beliefs and attitudes when the information came from in-group members, but the degree to which this peripheral route of processing information will result in long-term attitude change is unclear (Puhl et al., 2005). Incorporating an intervention that is derived from attitude change theory may provide further information about effective attitudinal intervention for reducing obesity stigma. This information



would allow future studies to integrate the effective components of informational, social, and attitudinal interventions in order to test a more comprehensive curriculum approach for reducing anti-fat person attitudes in secondary students.

## **CHAPTER THREE: METHOD**

### **Participants**

The student sample ( $N = 135$ ) consisted of 72 male and 63 female secondary students in the Burriss Middle School. The sample included 46 students in sixth grade, 44 students in seventh grade, and 45 students in eighth grade. The sample included students who identified as Asian (6%), Black (8.1%), Hispanic (4.4%), Multi-racial (4.4%) and White (77%). The use of the classroom setting in this study was in accordance with the IRB guidelines for studies that qualify for review exemption (Ball State University IRB, September, 2009). The classes chosen for the study contained curricula content that, according to the Indiana State Standards of Education, was congruent with the information presented in the interventions. These classes were Health and Physical Education. There were several applicable standards for the Health curricula. One includes teaching students to develop an awareness of the ways in which environmental surroundings may affect emotional and physical health. The applicable standard for the Physical Education curricula includes the students' development of empathy for those of different physical status (Indiana Department of Education, n.d.).

Following Institutional Review Board (IRB) approval and the consent of the Burris Research committee, students participated in this study as part of their learning in health and physical education. Six classes participated in the study. Students were enrolled in only one section of the six used for the study. Because the study focused on evaluating methods of curricula presentation, there was no incentive to participate beyond the usual and customary activities of the classroom. Burris is a laboratory school and consent to engage in research is a condition of the students' admission into the school. Hence, the researcher did not request additional informed consent from students or their parents.

### **Procedures**

Six classes of students were randomly assigned to two interventions: the information centered intervention or the elaboration-enhancing intervention. The information centered included a presentation of an educational video followed by activities which focused on recalling the information in the video. The elaboration-enhancing intervention included the presentation of the same video followed by a request for students to use the information presented to formulate arguments that would persuade others against anti-fat person attitudes. Students in all conditions completed the Anti-fat Person Attitudes scale and the Obesity Controllability quiz early in the school year (See Appendix A and Appendix B). The class instructor distributed the surveys simultaneously to each student. The order of the two surveys was counterbalanced. The instructors received written instructions that they read to the class prior to the administration of the survey. The instructions included a statement that the surveys were

related to a study of health and body sizes (Appendix C). Students wrote a five-digit code at the top of their surveys to facilitate pairing responses in follow-up surveys, but students were not informed that follow-up surveys would occur. The identification code consisted of the last two digits of the student's phone number, the first two letters of their favorite sport, and the two digit day of their mother's birthday.

Interventions occurred two weeks after the first administration of the Anti-fat Person Attitudes scale and the Obesity Controllability quiz. Classes in both interventions viewed a video about anti-fat person attitudes and the etiology of obesity. The video was designed by the Rudd Center for Food Policy and Obesity. The Rudd Center is located at Yale University and provides information to both researchers and the public about improving the world's diet, preventing obesity, and decreasing weight stigma (Rudd Center, 2010). The 16-minute video, "Weight Prejudice: Myths and Facts," was designed to raise teen awareness of weight prejudice and to help teens cope with weight-based teasing. The main presenter in the video was a 13-year-old girl who reviewed the myths and facts about obesity as part of her school science project. In the video, the adolescent girl carried a hidden camera to record the negative comments that her peers made about her weight. Three prominent researchers in the field of obesity and weight bias, Rebecca Puhl, Marlene Schwartz, and Karen Dorsey provided information about the etiology of obesity (Dorsey, Maul don, Magraw, Valka, Yu & Krumholz, 2010; Dorsey, Wells, Krumholz, & Concato, 2005; Puhl et al., 2008; Puhl & Brownell, 2006; Puhl & Latner, 2007; Puhl et al., 2005; Schwartz & Puhl, 2003; Schwartz, M., Vartanian, L., Nosek, B. & Brownell, 2005). The adolescent girl in the video described her behavior patterns

related to food and exercise as well as her emotional responses to the negative assumptions and comments of others. The specific myths that were discussed in the video included the following: (a) Obesity is only caused by eating too much and being lazy, (b) All overweight people are unhealthy, and (c) Prejudice against overweight persons is harmless and encourages weight-loss.

Prior to using the video in the intervention, it was presented to seven ninth grade students for the purpose of obtaining feedback on its persuasiveness. The students in the feedback group reported that they thought it would be appropriate for middle school students and indicated that they perceived the message as positively persuasive. The students in this group added two recommendations to increase the persuasiveness of the video. They noted that some parts were “cheesy” and suggested that the researcher make note of this to the students prior to showing the video. The students in the feedback group indicated that this mention would decrease the distraction of the “cheesy” parts. This suggestion was incorporated in the intervention by telling students that there were a few “cheesy” parts in the video that they should focus on the parts they thought were most persuasive. The feedback group also said that some additional statistics and specific follow-up information about the etiology of obesity would strengthen the persuasive message of the video. This suggestion was applied by providing students with a short list of additional facts following the video presentation in both groups (See Appendix D).

Immediately following the presentation of the video, students in both interventions completed a content mastery quiz (See Appendix E) for the purpose of ensuring their attention to and comprehension of the information in the video. Students in

the information-centered condition answered questions about the video content, commented on their perceptions of the quality of the video, and completed a word search containing terms from the video (Appendix F and Appendix G). Classes in the elaboration-enhancing condition viewed the same video as those in the information-centered condition. Prior to the presentation of the video, the classes were told about the basic content of the video and instructed to pay attention to the information that they thought was especially interesting in order to engage in a creative task following the video. After the video, students were asked to individually write about arguments, activities or programs that might reduce anti-fat person attitudes in schools. For example, the students were told to think about how they would teach students their age about anti-fat person attitudes if they were a teacher or how what argument they would use to persuade a peer. Students were reminded that their ideas were all equally valid. They were informed that they would have the opportunity to voluntarily share the ideas at the end of the class period, and that their ideas might be used in future curricula planning if they signed their papers with their permission. Some students in the first elaboration-enhancing intervention had difficulty generating ideas. The subsequent classes in the elaboration-enhancing condition were provided with some written scenarios about that required ideas and arguments to decrease anti-fat person bias. The students were told they could use these scenarios to facilitate thinking or disregard them. (Appendix H). Mean attitude change was later checked across the three elaboration-enhancing group to ensure that the variation in procedure between the first group and subsequent two groups did not add additional variability.

In order to reduce students' association between interventions and the surveys, the post-intervention surveys about anti-fat person attitudes and controllability beliefs were distributed two weeks after the interventions. Students were again asked to write their code at the top of the surveys. The instructions noted that student might recognize the surveys as it was a study about people's thought on health and weight over time (Appendix I).

Follow-up surveys were administered two months after the completion of the post-intervention surveys. In order to prevent potential negative affect if students' became frustrated about completing the same surveys again, they were informed that it was the final set of surveys and thanked for their participation. The Obesity Controllability quiz and the Anti-Fat Attitude scale were again presented simultaneously in counterbalanced order.

## **Measures**

**Anti-fat person attitudes Scale.** The Anti-fat person attitudes Scale (AFAS) assesses the degree to which people hold negative attitudes toward fat people (Lewis & Cash, 1997). The scale was developed with adults aged 18-49 years old. The 47-item composite scale provides an assessment of overall anti-fat person attitudes. The factors of the scale were extracted using principle components factor analysis with varimax rotation. Items with cross-loadings were not included in the subscales. The resulting three uncorrelated subscales yield information on specific types of negative attitudes: Social/Character Disparagement, Physical/Romantic Unattractiveness, and Weight/Control Blame. Social or character disparagement describes the negative

attitudes that result from individuals' perceptions of fat people as socially unacceptable. The Social/Character Disparagement subscale contains 15 items, such as "I do not want to associate with fat people" and "Society is too tolerant of fat people." The Cronbach's alpha for this subscale is .91 for men and .87 for women. Physical or romantic unattractiveness refers to the assessment of fat people as extremely unattractive or as unacceptable romantic or sexual partners. The Physical/Romantic Unattractiveness subscale contains 10 items, such as "Fat people should not wear revealing clothing in public" and "I don't understand how someone could be sexually attracted to a fat person" (Cronbach's alpha = .79 for men, .84 for women). Negative attitudes in the weight control category result from individuals' beliefs that fat people are responsible for their weight. The Weight Control scale contains 9 items such as "Fat people have no willpower" and "Most fat people buy too much junk food" (Cronbach's alpha = .77 for men and .85 for women) (See Appendix A). When administering all subscales and the unloaded items, the Cronbach's alpha for the composite score is .95 for both men and women. Respondents evaluate attitude items using a 5-point Likert rating scale that ranges from strongly disagree (1) to strongly agree (5).

For the purposes of this study, the Weight Control subscale was used to assess the negative attitude that results from the belief that people are responsible for their weight (Crandall, 1994). In order to ensure that the items were appropriate for the student age group, three experts who work with 12-14 year old adolescents reviewed the subscales. The experts were licensed professionals who had at least five years of experience working with adolescents in counseling or academic settings. The subscale was pilot-



tested on a group of seven 12-14 year old adolescents to assess the psychometric validity for the age group in this study group. Results of an inter-item correlation matrix to assess reliability showed an initial Cronbach's alpha of .67. Feedback from the pilot group indicated the need to revise a negatively worded item "Fat people do not necessarily eat more than thin people." This item was changed to "Fat people eat more than thin people do, so it's their own fault that they are big." A follow-up reliability analysis of the revised scale (N = 112) indicated a Cronbach's alpha of .84, indicating the appropriateness of using the scale for the adolescents in this study.

**Obesity Controllability Quiz.** The Obesity Controllability Quiz consists of 12 statements about obesity (See Appendix B.). The statements were obtained from information presented in the "Weight Prejudice: Myths and Facts" video and the accompanying discussion guide. The statements were chosen to represent all three learning objectives of the video. These three learning objectives focused on the information that corrects the myths related to the causes of obesity, the health of obese individuals, and the harm of prejudice. The quiz contains items such as "People who are fat usually eat a lot of junk food" and "There are biological and genetic causes of body weight which people do not have control over." The format of the survey was based on the Short-Obesity Knowledge Scale in that the response choices were "true," "false," or "uncertain" (Price, O'Connell, & Kukula, 1985). Price et al. assessed four different response formats for the 12-item Short-Obesity Knowledge Scale. The results indicated that a format that allowed students to indicate whether they thought statements were true, false or that they were uncertain about the veracity of the statement yielded test-retest

reliabilities of .74. This format also resulted in questions that were consistent with a 9<sup>th</sup> grade reading level while the multiple choice and Likert scale format yielded a reading level that was appropriate for 12<sup>th</sup> graders. Because the population of interest in this study includes children in 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade, a format with the true, false, or uncertain response choices was used for the quiz. The questionnaire was pilot-tested on 7 students (ages 12-14) to ensure that the items accurately represent the information presented in the video and that the reading level was age-appropriate. An inter-item analysis indicated adequate reliability with a Cronbach's alpha of .72. Since this was a small set of students with which to assess reliability, a later inter-item analysis with the responses of 123 students verified the reliability of the measure (Cronbach's alpha = .726).

### **Experimental Design**

This study used a 2 (treatment) x 3 (time) repeated measures, quasi-experimental design with equivalent groups to assess the effectiveness of the interventions to reduce anti-fat person bias and beliefs about the controllability of obesity. Frequency data were used to ensure equivalency of groups in terms of sex, age, and ethnicity composition. The intervention format (elaboration enhancing, information-centered) and the time (pre, post, follow-up) of data collection served as the independent variables. In the elaboration-enhancing format, students watched the Rudd Center Weight Bias video first. They then brainstormed about information and arguments they could use to reduce anti-fat person attitudes. In the information-centered format, the Rudd Center Weight Bias video was presented, followed by a review of information in the video. Data collection

occurred before the presentation of the interventions (pre), after the presentation of the interventions (post), and at a two-month follow-up (follow-up).

The dependent variables in the study were the endorsement of anti-fat person attitudes and the endorsement of obesity-controllability beliefs. The primary outcome of interest was the potential interaction between intervention format and measurement time in reducing anti-fat person attitudes and beliefs about the controllability of obesity.

Figure 2 illustrates the data collection design of this study.

Figure 2

*Diagram of Study Design*

	<b>2 Weeks Prior to Intervention</b>	<b>Intervention</b>	<b>2 weeks following Intervention</b>	<b>2. 5 month Follow-up</b>
<b>Group 1</b>	Pre-surveys Beliefs and Attitudes	Information with memory tasks and content mastery quiz	Post-surveys Beliefs and Attitudes	Follow-up surveys on Beliefs and Attitudes
<b>Group 2</b>	Pre-surveys Beliefs and Attitudes	Information with elaboration exercise and content mastery quiz	Post-survey Beliefs and Attitudes	Follow-up Surveys on Beliefs and Attitudes

## **CHAPTER FOUR: RESULTS**

A 3x2 repeated measures multivariate analysis of covariance (MANCOVA) was conducted to assess the effect of two interventions on anti-fat person attitudes and beliefs about the controllability of obesity while controlling for the variable classroom teachers. The independent variable was intervention format (information-centered and elaboration-enhancing) and measurement time (pre-intervention, post-intervention, two and one-half month follow-up). The dependent variables were strength of anti-fat person attitudes (AFAT) and beliefs about the controllability of obesity (BELIEF). Results showed no interaction between measurement time and intervention format. The MANCOVA did show a main effect for the reduction of anti-fat person attitudes and controllability beliefs following the intervention.

### **Preliminary Data Screening**

Analyses were performed using SPSS General Linear Model. Data for participants who had been absent during the interventions were eliminated, reducing the final sample size from 126 to 123. Student absences resulted in some participants missing one of the survey administrations. Their data was included in the correlation analyses if they had attended the intervention in order to maximize statistical power.

These student responses were kept for the correlation analysis because multiple data points were not necessary for the analysis, and the additional data increased the power of the analysis. Ninety-five students attended class during the interventions and completed all three surveys. Forty-six students participated in the information-centered intervention, and forty-nine students participated in the elaboration-enhancing intervention. If participants missed answering a question on a survey, the missing datum was replaced with the mean of the other ratings on the survey. No surveys contained more than one missing response. Frequency statistics reflected equivalence of groups in terms of sex, grade, and ethnic composition. Preliminary analyses showed no differences in the responses of students according to their sex, ethnic composition or sports involvement such that these demographic differences were not included in the full analysis.

Data were assessed for outliers through Stem and Leaf plots. Three outliers were identified by their place in the extreme response range for both dependent variables.

These outliers were eliminated prior to the analysis.

The assumption of normality was assessed with descriptive statistics, Q-Q plots, and histograms. Results revealed that AFAT scores and BELIEF scores were positively skewed. Square root transformations yielded skewness and kurtosis statistics that were in the acceptable -1 to 1 range. Despite the transformations, the Shapiro-Wilk's test of significance showed that the data departed from the normal curve. Mertler and Vannatta (2002) suggested that normal histograms with acceptable skewness and kurtosis statistics are sufficient to proceed with an analysis even if tests of normality are significant. The Scatterplots were elliptical for all combinations, also indicating sufficient linearity and

normality. Finally, a correlation matrix for the dependent variables of anti-fat person attitudes and beliefs about obesity indicated that these variables were related, confirming the appropriateness of using a MANCOVA as opposed to two separate ANOVA analyses (Mertler & Vannatta, 2002). Table 1 shows the intercorrelations among anti-fat person attitudes and beliefs about the controllability of obesity across the three measurement times.

Table 1

*Intercorrelations Among AFAT and BELIEFS Across Time*

	AFAT Pre- Survey	AFAT Post- Survey	AFAT Follow-up Survey	BELIEF Pre- Survey	BELIEF Post- Survey	BELIEF Follow-up Survey
AFAT Pre- Survey	1					
AFAT Post- Survey	.522**	1				
AFAT Follow-up	.447**	.554**	1			
BELIEF Pre- Survey	.625**	.395**	.302**	1		
BELIEF Post- Survey	.456**	.611**	.522**	.493**	1	
BELIEF Follow-up	.393**	.388**	.392**	.410**	.720**	1

Note. \*\*Correlation is significant at the .01 level (2-tailed).

### **Assessment of Potential Covariates**

The participants in the study were comprised of three different grade levels. Students were taught by one of two teachers during the time of the intervention and administration of the pre-intervention surveys and the post-intervention surveys. Interventions also occurred eight o'clock in the morning or eleven o'clock. Because a students' teacher, grade level or varying energy levels according to the time of the intervention may have affected responses, initial univariate analyses were conducted to assess whether these factors were potential covariates. Only the difference in classroom teacher resulted in significant group differences in the univariate analyses ( $F = .188, p < .001$ ). Therefore final MANCOVA included teacher as a covariate in order to remove the potential confounding influence of differences in classroom teacher at the time of the intervention.

### **Multivariate Analysis**

The first analysis in the MANCOVA assessed the degree to which the independent variables of measurement time and intervention format as well as the covariate of teacher influenced the linear composite dependent variable. These results showed that the covariate of teacher did not significantly interact with the independent variable of intervention format, but it did interact with measurement time. Thus, teacher was substantiated as a covariate in the full MANCOVA ( $F = 4.982, p < .001$ ). The results of the MANCOVA with the effect of the covariate removed showed overall significance for the influence of the within subjects variable, measurement time, on the combined dependent variables. The between subjects variable of intervention format did

not have a significant effect. The lack of interaction between the measurement time (pre-intervention, post-intervention, follow-up) and intervention format (information-centered or elaboration-enhancing) indicated the acceptability of assessing the main effects for these two variables. Because Box's M revealed equality of variance across groups ( $F = .918, p = .567$ ), the Wilks' Lambda test was used to interpret results (Mertler & Vannatta, 2002). Table 2 shows the main effects for the influence of time and condition on the combined dependent variables of anti-fat attitudes and controllability beliefs.

Table 2

*Multivariate Source Table*

<i>Source</i>	$\Lambda$ <i>Value</i>	<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
Measurement time	.270	60.203**	4,89	.000	.730
Intervention	.971	1.380	2,91	.257	.029

\*\* $p < .001$

*Note.* Results show the effects of measurement time and intervention after the effect of the covariate "teacher" was removed.

**Univariate Analyses**

Two analyses of variance were conducted as follow-up tests to the MANCOVA (Mertler & Vannatta, 2002). Results revealed a significant difference in scores on the dependent variables of anti-fat person attitudes and beliefs about the controllability of obesity, as a result of measurement time (pre-intervention, post-intervention, follow-up). Table 3 presents the means and standard deviations for anti-fat person attitudes and controllability beliefs across measurement time.



Table 3

*Adjusted and Unadjusted Means for Anti-fat Person Attitudes and Controllability Beliefs at Pre-Intervention, Post-Intervention and Follow-up*

Measure	<u>Adjusted Means</u>			<u>Unadjusted Means</u>		
	Pre-	Post-	Follow-up	Pre-	Post-	Follow-up
AFAT						
<i>M</i>	4.86	4.17	4.18	4.87	4.17	4.18
<i>SD</i>	.07	.07	.08	.66	.64	.76
BELIEF						
<i>M</i>	4.65	3.96	4.05	4.65	3.97	4.05
<i>SE</i>	.04	.04	.05	.45	.42	.47

Table 4 and Table 5 present the means and standard deviations for anti-fat person attitudes and controllability beliefs across measurement time and intervention format.

Table 4

*Adjusted and Unadjusted Means for Anti-fat Person Attitudes at Pre-Intervention, Post-Intervention and Follow-up*

Anti-fat Person Attitudes						
Intervention	<u>Adjusted Means</u>			<u>Unadjusted Means</u>		
	Pre-	Post-	Follow-up	Pre-	Post-	Follow-up
Information						
<i>M</i>	4.71	4.11	4.10	4.72	4.15	4.11
<i>SD</i>	.10	.11	.11	.70	.77	.71
Elaboration						
<i>M</i>	5.02	4.23	4.26	5.01	4.19	4.25
<i>SE</i>	.10	.10	.11	.66	.64	.76

Table 5

*Adjusted and Unadjusted Means for Controllability Beliefs at Pre-Intervention, Post-Intervention and Follow-up*

Intervention	Controllability Beliefs					
	Adjusted Means			Unadjusted Means		
	Pre-	Post-	Follow-up	Pre-	Post-	Follow-up
Information						
<i>M</i>	4.71	4.11	4.10	4.55	3.93	4.05
<i>SD</i>	.10	.11	.11	.41	.45	.53
Elaboration						
<i>M</i>	5.02	4.23	4.26	4.74	3.99	4.05
<i>SE</i>	.10	.10	.11	.45	.42	.47

Prior to interpreting the univariate analyses, Mauchly's *W* was conducted to assess sphericity. Mauchly's *W* was not significant for anti-fat person attitudes ( $p > .05$ ), indicating the appropriateness of using Sphericity Assumed criterion for result interpretation. Mauchly's *W* was significant ( $p < .05$ ) for the dependent variable of controllability belief, indicating the appropriateness of using the Greenhouse Geisser Epsilon adjustment for result interpretation. Univariate homoscedasticity was confirmed with non-significant results of Levene's test for all levels of the dependent variables ( $p > .05$ ) (Mertler & Vannatta, 2002).

### **Anti-fat Person Attitudes**

Results of the univariate analyses showed a main effect of measurement time for the decrease in anti-fat person attitudes ( $F(2) = 4.180, p < .05, \eta_p^2 = .043$ ). The change in anti-fat person attitudes did not vary by intervention format ( $F(2) = .808, p = .449, \eta_p^2 = .009$ ). Follow-up pairwise comparisons provided additional information on the amount of change at the pre-intervention, post-intervention, and follow-up levels of

measurement time. These results are displayed in Table 6. The contrasts showed a significant decrease in anti-fat person attitudes from pre-intervention to the post-intervention ( $p < .001$ ). Anti-fat person attitudes did not change from post-intervention to follow-up ( $p = .883$ ).

Table 6

*Pairwise Comparisons for Anti-fat Person Beliefs*

Measure	Time	Mean Difference	Std. Error <sup>a</sup>	Sig.
AFAT	Pre- to Post-	.694*	.071	.000
	Post- to Follow-up	-.010	.070	.883
	Pre- to Follow-up	.684*	.000	.000

*Note.* Based on estimated marginal means.

\*The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Least Significant Difference

The results displayed in Table 5 support hypothesis 1a. This hypothesis predicted that anti-fat person attitudes would decrease from the pre-intervention measurement to the post-intervention measurement in the elaboration-enhancing condition. Conversely, the results do not support hypothesis 1b, which predicted that attitudes would remain the same in the information-centered condition. As predicted in 1c, results indicate that participants in the elaboration-enhancing condition maintained the decreased anti-fat person attitudes at the two and one-half month follow-up. Anti-fat person attitudes did not differ significantly between the post-survey and follow-up, supporting this hypothesis. It should be noted that the unpredicted decrease of anti-fat person attitudes in the information-centered condition was also maintained at follow-up. Comparisons of

follow-up scores with pre-survey scores also confirmed that reduced anti-fat person attitudes at follow-up remained significantly lower than those endorsed at the pre-intervention measurement ( $p < .001$ ).

### **Beliefs about the Controllability of Obesity**

Results of the univariate analyses also showed a main effect of measurement time for the decrease in beliefs about the controllability of obesity. ( $F(1,549) = 10.969, p < .001, \eta_p^2 = .107$ ). The change in beliefs about controllability of obesity did not vary by intervention format ( $F(1,549) = 2.738, p = .082, \eta_p^2 = .029$ ). Follow-up pairwise comparison revealed specific information for the amount of change at the pre-intervention, post-intervention, and follow-up levels of measurement time. These results are displayed in Table 7. The contrasts show a significant decrease in beliefs about the controllability of obesity from pre-intervention to post-intervention ( $p < .001$ ). Beliefs about the controllability of obesity increased between the post-intervention and follow-up measurements ( $p < .01$ ). Despite this increase, the follow-up measurement of beliefs about the controllability of obesity remained significantly lower than the pre-intervention measurement ( $p < .001$ ).

Table 7

*Pairwise Comparisons for Beliefs about Controllability of Obesity*

Measure	Time	Mean Difference	Std. Error	Sig. <sup>a</sup>
BELIEF	Pre- to Post-	.683*	.045	.000
	Post- to Follow-up	-.086*	.031	.007
	Pre- to Follow-up	.598*	.052	.000

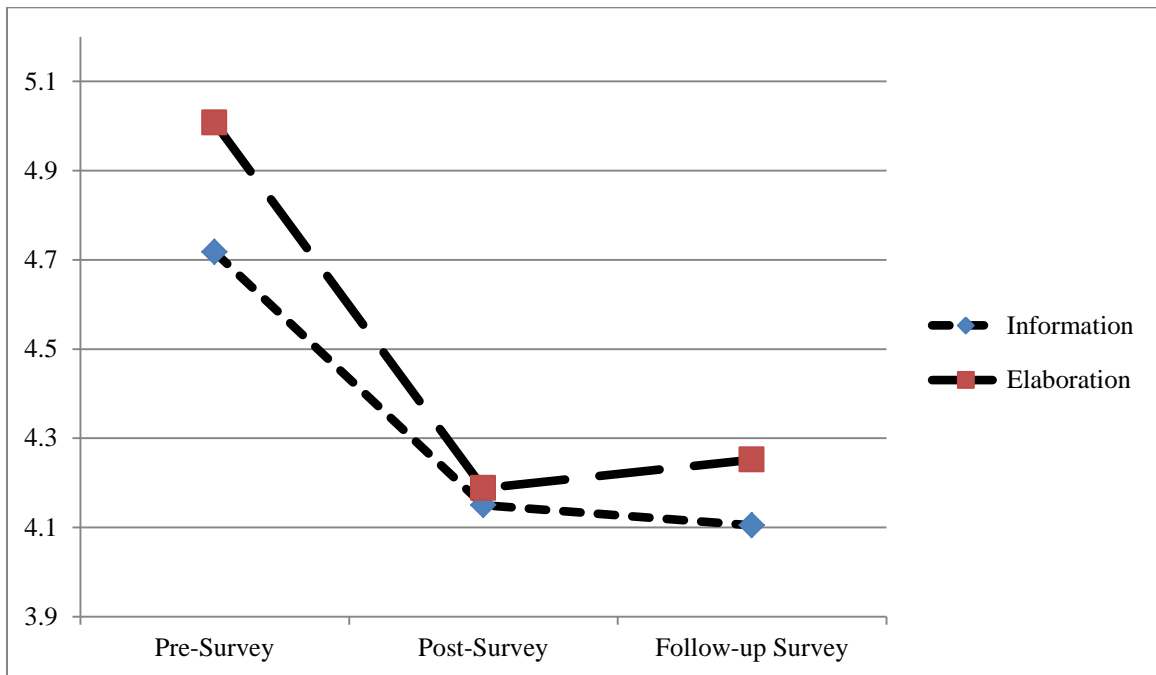
*Note.* Based on estimated marginal means. \*The mean difference is significant at the .05 level. a. Adjustment for multiple comparisons: Least Significant Difference

The univariate decreases in the controllability of beliefs about obesity support the predictions of Hypotheses 2 a and 2 b. Hypothesis 2a predicted that beliefs about the controllability of obesity would decrease from pre-intervention to post-intervention in the elaboration-enhancing condition. Hypothesis 2b predicted that beliefs about the controllability of obesity would also decrease from pre-intervention to post-intervention in the information-centered condition. Hypothesis 2c predicted that participants in the elaboration-enhancing condition would maintain decreased beliefs about the controllability of obesity at the follow-up measurement. This hypothesis was not supported as controllability beliefs at the two and one-half month follow-up showed a significant increase from the post-intervention measurement. The prediction of Hypothesis 2d, which stated that controllability beliefs would return to baseline in the information-centered condition, was not supported as the follow-up measurement indicated that beliefs about the controllability of obesity remained significantly lower than those endorsed at the pre-intervention measurement. Figure 3 and Figure 4 show the

plotted marginal means of anti-fat person attitudes and beliefs about the controllability of obesity.

Figure 3

*Anti-fat Person Attitude Means Across Time*



As reflected in the Figure 3, the slope of decline for negative anti-fat person attitudes in the elaboration-enhancing condition was slightly greater than that of anti-fat person attitudes in the information-centered condition. Conversely, it appears that attitudes continued to decline in the information-centered condition at follow-up while they remained the same at follow-up for the elaboration condition. The practical significance of post-survey to follow-up survey change should be interpreted with caution given the small magnitude of difference between scores.

Figure 4

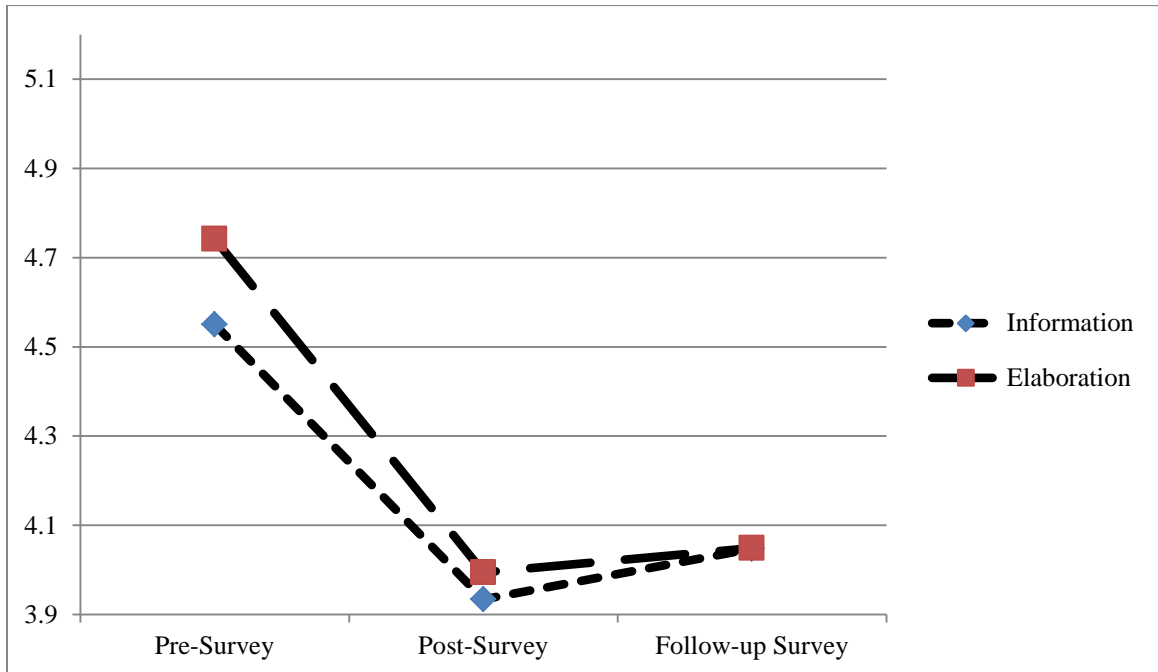
*Beliefs about Controllability Means Across Time*

Figure 4 shows very similar slopes in the decrease of controllability beliefs between the first and second response time for both conditions. Both groups showed a slight increase in these beliefs from the post-intervention to follow-up intervention measurement. Because of the small magnitude of this increase, the practical significance of these results should be interpreted with caution.

## **CHAPTER FIVE: DISCUSSION**

The present study compared the degree to which two intervention formats, information-centered and elaboration-enhancing, reduced endorsement of anti-fat person attitudes and beliefs about the controllability of obesity. The term “anti-fat person attitudes” refers to the pejorative character assumptions (i.e. lazy, lacking willpower) about obese individuals. The term “beliefs about the controllability of obesity” refers to the degree to which people believe that the obesity is caused by individual behavioral choices (i.e. overeating, not exercising). Although both interventions provided information about the etiology of obesity and myths about obese people, two different approaches were used to frame students’ processing of the information.

The information-centered intervention focused on students’ review and memory of the information presented. These students watched an educational video and then completed worksheets that included recall questions about the information in the video, questions about students’ perceptions of the video, and a word-search puzzle containing words from the video. The results of prior research using the information-centered approach indicated that providing information about the complex etiology of obesity changed beliefs but not attitudes (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000;



Harris, 2001; Irving, 2000). Thus, the second type of intervention in this study focused on integrating the elaboration likelihood model of persuasion to facilitate attitude change.

The elaboration-enhancing intervention required students' to watch the educational video and subjectively identify the most persuasive information. The focus on the merits of the information presented was intended to facilitate the central route processing that is associated with enduring attitude change (Cacioppo et al., 1991). Following the video, students were asked to integrate the identified information into novel strategies for persuading others to reduce anti-fat person attitudes. This counter-attitudinal advocacy approach to enhancing elaboration has been successful in previous studies on attitude change (Widgery & Miller & Miller, 1973). The goal of the present study was to explore and compare the relative effectiveness of the information-centered intervention and the elaboration-enhancing intervention in altering students' beliefs about the controllability of obesity and their anti-fat person attitudes.

A large body of research has confirmed the presence of anti-fat person attitudes in adolescents (e.g. Greenleaf et al., 2006) but few studies have endeavored to test the effectiveness of interventions to reduce them. The purpose of the present study was to identify intervention strategies that can be integrated into school-based programs to reduce anti-fat person attitudes and the associated teasing of obese adolescents. In addition to informing school-wide bullying prevention initiatives, this preliminary research is necessary to build a comprehensive fund of knowledge that will inform intervention efforts across age groups.

In order to compare the relative effectiveness of the two intervention formats, the current study used a repeated measures between-within subjects design. Data from three survey administrations was analyzed using a repeated multivariate analysis in order to assess changes in anti-fat person attitudes and beliefs about the controllability of obesity across time. This analysis also assessed whether there was an interaction between the amount of attitude or belief change and the type of intervention format. The first survey administration assessed students' baseline beliefs about a person's ability to control obesity (controllability beliefs) and the degree to which they endorsed negative character statements about those who are obese (anti-fat person attitudes). The same surveys were administered the second time to assess whether students' beliefs and attitudes had changed as a result of participating in one of the interventions. A two and one-half month follow-up administration of the surveys provided information about the long-term maintenance of any attitude or belief changes.

The multivariate analysis revealed an equal amount of reduction in anti-fat person attitudes and controllability beliefs across intervention formats. These results indicate that the type of intervention did not have a differential effect on the amount of attitude and belief change. On the other hand, the multivariate analysis did reflect a change in attitudes and beliefs over time. The specific nature of these changes was assessed with univariate analyses and follow-up between-level contrasts. These contrasts showed a significant reduction in anti-fat person attitudes and controllability beliefs following the interventions.

While scores were transformed for the purpose of meeting test assumptions in the statistical analyses, a review of these changes in terms of students' raw scores provides additional information on the practical significance of this change. On the anti-fat person attitudes test, students' endorsement of negative character attributions decreased from an average raw score of 24.62 to 17.96 from pre-intervention measurement to post-intervention measurement. This decrease reflects an average decline of .73 points per individual item, indicating that students' shifted close to one Likert category lower on each statement. For example, students who initially reported agreeing with anti-fat person biased statements tended to shift almost one point toward neutral on each individual statement. Those who initially reported being neutral in their agreement with anti-fat person statements shifted to disagreeing with many of the statements. A similar pattern occurred with the controllability belief scores. Students shifted from endorsing personal responsibility for obesity to responding that they were uncertain about the etiology or that they disagreed with statements that focused only on personal responsibility without acknowledgement of the genetic factors.

The first research question investigated potential reductions in anti-fat person attitudes and whether the type of intervention would affect these changes. Students participated in one of the two interventions described above and answered survey questions about their attitudes before the presentation, after the presentation and at a two and one-half month follow-up administration. Students' endorsement of anti-fat person attitudes significantly decreased after the presentation of information about the complex etiology of obesity. Responses on the surveys at the two and one-half month follow-up

showed that students maintained this attitude change, indicating that the attitude shift was not simply a short-term response to the intervention. The amount of attitude change was the same across both the information-centered and the elaboration-enhancing interventions.

The second research question investigated potential reductions in beliefs that people who are obese have complete control over their weight. The research design paralleled that used for anti-fat person attitudes such that students participated in one of the two interventions and answered survey questions about their beliefs in pre-intervention, post-intervention and two and one-half month follow-up survey administrations. Students endorsed significantly fewer statements about the controllability of obesity after the interventions than they did prior to the interventions. Controllability beliefs declined to an equal extent in both the elaboration-enhancing and the information-centered condition. As with changes in attitude, follow-up measurements of beliefs showed that they remained significantly lower than the pre-intervention measure. On the other hand, the follow-up measurements of beliefs were significantly higher than the post-intervention measurements. Participants' endorsed more beliefs about the controllability of obesity than they had at the post-intervention measurement, possibly indicating the potential for beliefs to return to baseline over time.

The primary conclusion of the present study is that education-based interventions can effectively change beliefs about the etiology of obesity and reduce anti-fat person attitudes. The results do not support differential effectiveness of deliberately trying to increase elaboration versus focusing on the recall of the information. An educational

video utilizing a same-aged peer was presented in both intervention types, possibly indicating that the video itself was more important than the type of processing that occurred afterward. Most of the students responded positively to the video, as noted anecdotally through observation, in-class comments, and written feedback. Thus, the integration of positively perceived technology and the attention to the facts discussed in the video may have been the primary mechanism of change.

### **Limitations**

One of the primary threats to the generalizability of this research is the low internal validity of the elaboration-enhancing intervention. Difficulty with instructor coordination and communication resulted in several validity threats. Additionally, the classes in the elaboration-enhancing intervention had unequal amounts of time to work through the exercises. One class had 20-30 minutes while another only had 10-15 minutes to address the task. Further, one class had a great deal of difficulty maintaining attention. They expressed disappointment at the beginning of the intervention because they had been informed that they would be going to a special gym class that day. They also had a substitute teacher for class on the day of the intervention. In contrast to the difficulties for the elaboration-enhancing intervention, each section of the information-centered intervention was characterized by adequate time and consistent attention of the students.

In addition to the difficulties with the actual presentation in the elaboration-enhancing condition, it is possible that some students had limited capacity or motivation to engage in the activities following the video activity. Students in the sixth grade

appeared to have more difficulty generating ideas related to persuading others compared with those in the seventh and eighth grade. Although the preliminary analyses of variance for group differences did not reflect grade-related differences, the developmental difference in the capacity to engage in abstract reasoning activities may have undermined the capacity of the elaboration-enhancing activities to foster additional processing. Engagement in elaboration-enhancing activities may also have been adversely affected by the absence of material incentives (i.e., gift cards) if this absence lowered motivation to process (Cacioppo et al., 1991). A material incentive was not included in order to increase the generalizability of results to other classroom settings, but this decision may have also jeopardized one of the primary requirements of the elaboration likelihood model—motivation to process. These limitations reduce confidence that the elaboration likelihood model was actually tested, and it reduces the utility of predicting the results of future elaboration likelihood model research based on these results.

### **Strengths**

Despite the threat to the validity of the elaboration-enhancing intervention, several methodological strengths support the conclusion validity regarding the overall effectiveness of the interventions in reducing anti-fat person attitudes and changing beliefs about the etiology of obesity. The initial small group pilot study with ninth grade students confirmed the appropriateness and positive perception of the video. Many students in the study also confirmed the positive perception of the video and its message. This feedback helped to ensure the perceived credibility of the source (Cacioppo et al.,

1991). The small group's feedback on the wording of the surveys, the item analyses based on their responses, and the experts' review helped to ensure that the statements in the surveys were appropriate for the age group of the study.

The counterbalancing of survey order helped to ensure that the student responses did not reflect order effects. Further, random assignment of classes helped to decrease potential cohort effects. The threat of history was minimized through careful attention to the time administration of the surveys to each class. Additionally, the time intervals between each survey administration were equal among classes in order to minimize the differential effects of media, social influence, or memory decay of the information presented. The presentations included the same video and presenter for all classes to minimize any differences in intervention processing based on perceived attractiveness or credibility. In order to keep students blind to the relationship between the intervention and the surveys, the teachers administered and collected the surveys without the presenter present. This strategy also minimized the possibility that students' survey responses would be based on their positive or negative perceptions of the presenter. Finally, student's individual completion of post-video activities helped to maximize potential for processing and attitude change by reducing the potential for group think (Petty et al., 1980).

### **Theoretical Implications**

The intervention approach of providing accurate information about the etiology of obesity to reduce anti-fat person attitudes is grounded in the stigma literature which indicates that people negatively assess others who they perceive as personally responsible

for their stigma (Miller & Porter, 1988). Goffman (1963) noted that stigma is especially strong when it is linked to the perception that the one is deliberately flouting acceptable cultural values. In the case of obesity, perceptions that people are capable of changing their weight to a socially acceptable range and not doing so indicates a laziness that contradicts the value of the Protestant work ethic (Crandall, 1994; Miller & Porter, 1988). In this study, the endorsements of statements that a person is responsible for obesity because of behavioral choices align with the theory of Miller and Porter. The correlations between overall endorsements of anti-fat person attitudes and endorsements of controllability beliefs parallel those of previous studies (e. g. Lewis & Cash, 1997).

Previous studies have shown that providing information about the complex etiology of obesity changed beliefs but not attitudes (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000; Irving, 2000). According to the literature on attitude change (Cacioppo, et al., 1991), people are more likely to change their attitudes if they actively assess the message presented than if they passively accept the information based on the attractiveness or credibility of the presenter. The effectiveness of both intervention types in this study and the similarity in attitude change between the two groups does not support the elaboration likelihood model of change. At the same time, the presence of potential confounding factors threatened the validity of the elaboration-enhancing intervention such that absolute conclusions cannot be made about its effectiveness. Aside from these potential confounds, it is possible that central route processing occurred during the video in both intervention types and that all students continued to elaborate on the information after the video presentation. Elaboration during the video may have



minimized the effect of different post-video activities in the two intervention types. Alternately, the equal amounts of attitude change may indicate that factual information which specifically contradicts faulty assumptions initiates attitude change.

### **Practice Implications**

The findings in this study parallel those of previous studies which showed the presence of anti-fat person attitudes in adolescents (Eisenberg et al., 2003). As with previous studies, these attitudes were present in both males and females of various ethnicities (e.g. Greenleaf et al., 2006). The results of this study suggest that students have the capacity to change their beliefs and attitudes about obesity. This implication is crucial as previous school-based intervention studies reported limited success in changing either dimension of thought (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000).

The integration of the interventions into classes that had related academic standards of learning supports the potential to reduce anti-fat person attitudes throughout the course of regular instruction. This instruction may be most effective when teachers integrate discussions about obesity and anti-fat person attitudes throughout the year. Learning literature has established the association between repetition and content mastery (e.g., Greene, 1989). The maintenance of new beliefs and attitudes in this study may have been partially related to the multiple survey points that increased students' mindfulness of the issue. In addition, one of the teachers appeared to have a high level of enthusiasm about the interventions of this study and may have referred back to the information in later lessons. If this occurred, the additional points of learning may have accounted for teacher differences in the degree to which students maintained lower controllability

beliefs. Integrating the information throughout the year or providing “booster” sessions may help students maintain accurate beliefs and possibly increase the potential for long-term reductions in anti-fat person attitudes.

Part of the success in this study may have been the use of a positively perceived video to present the information. Several students commented that they could relate to the school setting that was used in the video and to the adolescent girl who told her story. Using videos which students perceive as relevant to their own lives will increase their sense of involvement with the subject material, thereby increasing the potential for attitude change. Students made comments that they believed in the accuracy of the information presented because of the video segments that highlighted credentialed experts. Their attention to the experts confirms the importance of highlighting the credibility of the sources who present the information.

The equivalent attitude change across both interventions regardless of the tasks following the video indicates that several types of activities might be effectively paired with audio-visual presentations. This flexibility affords teachers the opportunity to tailor follow-up activities to the age and personality of each classroom.

### **Success of Interventions**

Previous research has shown limited success in changing anti-fat attitudes. Puhl, et al. (2005) was able to change attitudes of college students when they manipulated individuals' perceptions of social consensus regarding anti-fat person attitudes. Crandall (1994) was also able to change attitudes of college students by providing them with a two-page message about metabolism and genetic influences on obesity. Attempts to

change attitudes in applied settings, such as schools, were not successful (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000). The reduction of anti-fat attitudes in this study may have resulted from a combination of factors. The length of the intervention was longer than that of the previous studies. Each class focused on the issue of anti-fat person attitudes for at least 40 minutes. Additionally, this intervention used a video presentation as the primary means of presenting information. Several students advocated for the use of video style presentations when they wrote suggestions about ways to persuade others to reduce anti-fat person attitudes. Students were noticeably more quiet and attentive during the video presentation than they were during the verbal instruction of the same intervention session. Thus, the use of media with these adolescents may have been more effective in presenting the message than the verbally presented information of previous studies.

The findings of equivalent anti-fat attitude reduction in both conditions contradicted both the hypothesis that an elaboration-enhancing condition would result in increased attitude change and the hypothesis that the information-centered condition would have no effect on attitude change. It may be that the video itself was so powerful in stimulating elaboration that the extra elaboration-enhancing activities did not have an additional effect. On the other hand, it is possible that the activities that were intended to facilitate rote recall of information in the video helped students consolidate and integrate the information into their schemas about obesity in a way that counterbalanced the effect of the elaboration condition.

Withers and Wertheim's (2004) research on applying the elaboration likelihood model to facilitate increased attitude change showed results similar to those in this study. Although their subject matter focused on changing individual body image attitudes rather than general anti-fat person attitudes, they also showed a video with follow-up elaboration tasks. Results indicated that showing the video was more effective in changing attitudes compared to a control group which did not watch it, but the elaboration activities did not facilitate additional change. Withers and Wertheim discussed the possibility that the video may have been persuasive enough to facilitate the maximum amount of attitude change. The persuasiveness of the video may be a similar factor in the present study as many students commented positively on its format, teen presenter, setting, and message presentation.

### **Research Implications and Future Directions**

Because single class-length interventions reduced anti-fat attitudes at the two and one-half month follow-up, additional longitudinal and cross-sequential studies with multiple points of intervention will provide information about the types and frequencies of educational interventions that facilitate lasting attitude change. These additional studies would also provide information about the frequency that is needed for students to maintain accurate beliefs about the etiology of obesity. The presence of a control group in future studies may provide additional information to separate intervention effectiveness from cultural changes or developmental change.

Several ninth grade students who participated in the video and survey feedback group expressed interest in assisting with the research and the broader intention of

spreading awareness about anti-fat person attitudes. Student-led initiatives may positively change anti-fat person attitudes in the school climate as both Goffman (1963) and Puhl et al (2002) have address the influence of social influence in both strengthening and lessening anti-fat person attitudes.

The study does have some sociopolitical validity in its relevance to the current issues of child obesity and bullying (Prilleltensky & Prilleltensky, 2003). Students appeared open to learning new ways of assessing obesity, as reflected in their classroom comments and lower endorsements of anti-fat person statements in the survey results. The current initiative to decrease bullying through school-wide interventions (Limber & Small, 2003) provides the opportunity for education about obesity, anti-fat person attitudes, and size-based bullying to be integrated into the anti-bullying curriculum. Some students in one class made comments about the way their friends were teased for being too thin. Thus, it appears that discussions about obesity myths may facilitate or be integrated into discussion that will prevent teasing of small sized individuals as well.

While this study focused on interventions for obesity-related teasing, the primary elements of the interventions may be useful in preventing other types of bullying. Providing specific information to correct wrong assumptions and increasing students' involvement in re-assessing these assumptions may facilitate attitude change toward religious, racial, sexual orientation, and other student differences.

### **Summary and Conclusions**

The present study sought to obtain information about the relative effectiveness of two types of interventions, elaboration-enhancing and information-centered, in reducing

middle school students' anti-fat person attitudes and beliefs about the controllability of obesity. The use of these two intervention formats and three survey administrations provided information about potential differences between groups as well as changes within groups across time. A repeated measures multivariate analysis with simple contrasts showed a main effect of change over time but no interaction between time and the type of intervention presented. Students' endorsement of anti-fat person attitudes weakened between the pre-intervention and post-intervention survey administration. The attitude changes were maintained at the two and one-half month follow-up., Students' responses about the etiology of obesity similarly reflected less agreement that obesity is caused by individual choices and behavior after the interventions. These changes in beliefs remained significantly lower than the pre-intervention endorsements but increased from the post-intervention to follow-up measurement. The amount of change in attitudes and beliefs did not differ between the elaboration-enhancing and information-centered groups, but validity threats in the elaboration-enhancing intervention limit the conclusion validity of these results.

Clarification about the effectiveness of elaboration-enhancing interventions to reduce anti-fat person attitudes can be obtained with future research on the activities that are most likely to facilitate elaboration in this age group and whether this additional elaboration further reduces anti-fat person attitudes. The overall effectiveness of the interventions in facilitating attitude change indicates that the beliefs of middle school students are malleable such that information about the etiology of obesity may facilitate more positive attitudes toward obese persons. Such educational interventions may over

time affect the school climate in a way that minimizes the social acceptability of teasing obese peers. Longitudinal studies will afford additional information about the relationships among interventions, attitude change and behavioral change to further inform curricula changes and current school-wide bullying prevention programs.

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Appendix A: Weight/Control Survey Subscale from Anti-fat Attitudes Test

Please circle the degree to which you agree or disagree with the following statements.

**1-Strongly Disagree    2-Disagree    3-Neutral    4-Agree    5-Strongly Agree**

1. There's no excuse for being fat.

1                      2                      3                      4                      5

2. Most fat people buy too much junk food.

1                      2                      3                      4                      5

3. Most fat people are lazy.

1                      2                      3                      4                      5

4. If fat people really wanted to lose weight, they could.

1                      2                      3                      4                      5

5. Fat people have no willpower.

1                      2                      3                      4                      5

6. The idea that genetics causes people to be fat is just an excuse.

1                      2                      3                      4                      5

7. If fat people knew how bad they looked, they would lose weight.

1                      2                      3                      4                      5

8. Most fat people will latch onto almost any excuse for being fat.

1                      2                      3                      4                      5

9. Fat people eat more than thin people do, so it's their own fault that they are big.

1                      2                      3                      4                      5



## Appendix B: Obesity Controllability Survey (cont.)

10. Assuming that people can control their weight is similar to assuming that people can control their eye color.

True

False

Uncertain

11. Obesity is usually caused by eating too much.

True

False

Uncertain

12. Prejudice against overweight people can make them physically sick.

True

False

Uncertain

## Appendix C: Survey Instructions for First Administration

### Survey Instructions:

These surveys are related to a study of health and body size. Please choose the extent to which you agree with each statement on the surveys. Try to answer as honestly as possible. **For the purposes of data entry, the researcher would like you to place the last two digits of your phone number, the first two letters of your favorite sport, and the two digit day of your mother's birthday at the top of your surveys marked "Code."**

**Example: If your name is Sally Williams, your favorite sport is volleyball, and your mother's birthday is on the 15 (of any month), your code will be:**

**SWVO15.**

**\*If you do not know the day of your mother's birthday, you can use the day of another birthday. Just make sure that it is one you can remember easily when you are asked for this code in the future.**

Your teacher will not see your completed surveys.. When you are finished with your surveys, please put them in this envelope for the researcher.

#### Appendix D: Additional Statistics and Facts about Obesity

1. Genetic factors account for 45-70% of the variability in people's weight.
2. Childhood obesity is strongly affected by patterns during the mother's pregnancy.
3. Difficulty sleeping can contribute to weight differences.
4. Some medicine has side effects that cause people to gain weight.
5. A 10% weight-loss is considered a success according to research with data from the National Weight Control Registry. Even if very large individuals change eating and exercise habits, their weight loss may still be too small to shift them into the non-obese category.

#### Sources:

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Appendix E: Content Mastery Quiz

**Weight Bias: Myths and Facts**

**Please Circle TRUE or FALSE according to the information you heard in the film.**

1. In the film, Bene reported that she struggled with eating too many donuts.      T    F
2. According to the obesity experts, obesity is caused by a combination of many factors    T    F
3. According to the film, making fun of others about their weight will motivate them to lose weight.    T    F
4. Bene's thin friend ate a healthier diet than Bene.    T    F
5. According to Bene and the experts in the film, people who are obese don't exercise.    T    F

## Appendix F: Word Search and Video Quality Questions for Information-centered Format

## Weight Bias: Myths and Facts

t	s	n	h	t	l	a	e	h	a	r	y	e	prejudice
a	n	d	u	e	l	u	p	n	s	s	s	h	health
s	o	k	n	t	s	a	f	k	a	e	r	b	twinkies
y	i	w	f	e	r	i	z	m	p	o	a	o	exercise
g	t	e	p	i	i	i	c	y	r	t	o	s	lazy
o	p	i	e	r	p	r	t	r	w	a	c	g	harmful
l	m	g	s	n	e	o	f	i	e	h	h	n	friends
o	u	h	i	e	e	j	n	o	o	x	e	i	obesity
i	s	t	z	r	b	k	u	o	o	n	e	s	teasing
b	s	t	e	n	i	o	l	d	o	d	t	a	biology
l	a	t	n	e	m	n	o	r	i	v	n	e	nutrition
z	s	n	s	g	e	n	e	t	i	c	s	t	environmental
s	y	i	l	a	n	o	i	t	o	m	e	p	school
													genetics
													assumptions
													breakfast
													size
													food
													weight
													emotional
													stereotypes

## Video Feedback

- 1.) What did you think about the sound quality of the video?
- 2.) What did you think about the setting and/or format in which the information was presented?
- 3.) Do you think the information presented in the video was easy to understand?

Appendix G: Video Review Questions for Information-Centered Format

List the three main myths in the video.

List the three main facts in the video.

Name as many assumptions as you can that people made about the girl portrayed in the video.

Do you remember the name of the teacher for whom the adolescent was preparing the video?

What did the experts in the video say about the causes of obesity?

What were the food and exercise habits of the adolescent in the video?

### Appendix H: Questions to Facilitate Elaboration

1. Think about the girl in the video who made fun of Bene in the cafeteria. Why might she think it is okay to make fun of fat (obese) people? What information from the video might you use to convince her that her prejudice isn't fair?
2. Think of Mr. Tully, the teacher in the video. What information does he need to know? If you were a teacher, how would you help students accept people of all sizes.
3. Suppose that a person your age, or someone you know thinks that people who are obese are just lazy and could lose weight if they tried hard enough. What facts or what would you say to convince them otherwise?
4. If you were to make up some kind of game or video to help educate people about fat bias and to change their attitudes, what would be something cool that students your age would pay attention to?
5. You know how schools are trying to get kids not to bully and tease each other? If you were the principle of the school, what might you do to make it cool or normal to treat obese people well? (so that it would be considered uncool to be prejudiced against obese/fat people?)
6. You might know from watching TV and seeing diet ads and jokes about fat people that many adults are also prejudiced against fat/obese people. Why do you think this is? What might change their attitudes?

Other creative ideas that you think would help persuade people not to be prejudiced against fat/obese people?

## Appendix I: Instructions for Second Survey Set

### Letter of Introduction and Instructions

Dear Student,

You may recognize these surveys—they are about how people’s thoughts on health and body size change over time. The researcher is very interested in your responses. Please choose the extent to which you agree with each statement on the surveys. Try to answer as honestly as possible. **For the purposes of data entry, the researcher would like you to place the last two digits of your phone number, the first two letters of your favorite sport, and the two digit day of your mother’s birthday at the top of your surveys marked “Code.”** These codes will not be used to identify you in any way but will help the researcher to track the data. **Only the researcher will see your surveys.** When you are finished with your surveys, please put them in this envelope for the researcher. Please know that there is no penalty if you choose not to complete the surveys. If you would like information about the results of the study, they will be available at the school guidance office during the early part of next year.

Example of Code:

**If your phone number is 765-717-4040, your favorite sport is volleyball, and your mother’s birthday is on the 15th (of any month), your Code will be:**

**40VO15.**

**\*If you do not know the day of your mother’s birthday, you can use the day of another birthday. Just make sure that it is one you can remember easily if you are asked to use this code in the future.**

### Instructions for Final Survey Set

Dear Student,

This is the final set of surveys about health and body size. The researcher is very interested in your responses. Please choose the extent to which you agree with each statement on the surveys. Try to answer as honestly as possible. **For the purposes of data entry, the researcher would like you to place the last two digits of your phone number, the first two letters of your favorite sport, and the two digit day of your mother's birthday at the top of your surveys marked "Code."** These codes will not be used to identify you in any way but will help the researcher to track the data. **Only the researcher will see your surveys.** When you are finished with your surveys, please put them in this envelope for the researcher. Please know that there is no penalty if you choose not to complete the surveys. If you would like information about the results of the study, they will be available at the school guidance office during the early part of next year. Thank you.

Example of Code:

**If your phone number is 765-717-4040, your favorite sport is volleyball, and your mother's birthday is on the 15th (of any month), your Code will be:**

**40VO15.**

**\*If you do not know the day of your mother's birthday, you can use the day of another birthday. Just make sure that it is one you can remember easily if you are asked to use this code in the future.**

**Your CODE:** \_\_\_\_\_

**SEX:** \_\_\_\_\_ Male \_\_\_\_\_ Female

**Sport you play or other competitive fitness activity** \_\_\_\_\_ **(leave blank if this does not apply to you)**

**Race and/or Cultural Ethnicity:** \_\_\_\_\_