MODIFICATION OF WEIGHT BIAS: EXAMINING THE EFFECTS OF SOCIAL INFLUENCE ON THE EXPRESSION OF ANTI-FAT ATTITUDES

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Widespread implicit and explicit bias and discrimination based on weight have been documented in many key areas of life. The objective of this study was to test the effects of different types of influences on the expression of stereotypes towards people who are obese. Participants included 158 undergraduate students who were randomly assigned to one of four conditions. In three conditions (fourth was a control), participants completed measures of attitudes towards people who are obese prior to and after receiving manipulated feedback depicting attitudes of others (anonymously or non-anonymously) or scientific information about the base rates of these traits in the obese population. This study compared bias levels between a non-anonymous (Public Feedback) and anonymous feedback conditions. It also compared participants’ attitude change in the social feedback conditions with a trait prevalence feedback condition. These changes were examined for both explicit and implicit attitudes and participants’ motivations for potential attitude change were also assessed. Results indicated that explicit beliefs are influenced more when people perceive that others’ views are inconsistent with their own in a non-anonymous setting than an anonymous one. Trait prevalence information was less effective than non-anonymous feedback but more effective than the anonymous condition in reducing negative biases. Implicit anti-fat biases were quite evident and more resistant to change than explicit beliefs. Thus, people are sensitive to the views of others when expressing opinions about groups of others, especially when this expression occurs in a public setting. Perceived opinions of others may slightly influence internal, automatic reactions to people who are obese as well.
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INTRODUCTION

The objective of this study was to test the effects of different types of influences on the expression of stereotypes towards people who are obese. The current study was interested in examining how individuals’ opinions about how people who are obese may be influenced by what they perceive other people believe or scientific information on people's beliefs about the obese population (trait prevalence feedback). In order to examine how our attitudes and beliefs are shaped by social or trait prevalence feedback, participants in the current study were exposed to different forms of information regarding others’ beliefs about obese people or scientific information about the base rates of these beliefs regarding the obese population. They were subsequently assessed for change in levels of negative bias as well as their own awareness of any change in their attitudes. Finally, participants were asked to provide rationales for why they thought their reported attitudes may have changed.

The following review begins with discussion of weight stigma and highlights research documenting the strong anti-fat bias in our current society. In addition, how people who are obese are affected by weight stigma, how anti-fat bias is measured and theories regarding the origin of anti-fat bias are discussed. Finally, Social Consensus theory and its potential for positively changing current levels of anti-fat bias in the general population was examined.
CHAPTER I. LITERATURE REVIEW

“Obesity” refers to excess body fat. It is commonly expressed in a ratio of weight (in kilograms) to height (in meters squared) called body mass index (BMI). One in three Americans is currently obese (BMI >30 kg/m²) and almost two-thirds are overweight (BMI 25 - 29.9 kg/m²; Ogden, 2006). According to National Health and Nutrition Examinations Survey (NHANES), between the years 1976 to 2004, for Americans over 20 years of age the obese category more than doubled increasing from 15 % to 33%. Individuals are therefore becoming obese in America at an ever increasing rate (Devlin, Yanovski, & Wilson, 2000; NHANES; Perri & Fuller, 1995).

Stigmatization of the Obese

Given that most Americans are overweight and one in three individuals is obese, it is surprising that research indicates that people who are obese remain socially acceptable targets of discrimination (Falkner, French, Jeffery, Neumark-Sztainer, Sherwood, & Morton, 1999; Kilbourne, 1994; O’Hara, 1996; Puhl & Brownell, 2001; Stunkard & Sorensen, 1993) and negative biases toward people who are obese in the general population is widespread (Goodman, Richardson, Dornbusch, & Hastorf, 1961; Harris, Harris, & Bochner, 1982; Lewis, Cash, Jacobi, Bobb-Lewis, 1997; Millman, 1980; Monello & Mayer, 1963).

A cursory review of articles related to stigmatization and stigmatization-related concepts reveal numerous terms often used interchangeably in regards to potential negative attributions and differential treatment of individuals who are overweight or obese. For example, the terms, discrimination, stigmatization, bias, stereotype and prejudice have been used in prior research to convey ideas about how they may be treated, thought about or emotionally reacted to in a negative manner as a direct result of their appearance (e.g., overweight status). Therefore, for the
purpose of the current investigation, it is important to distinguish the meanings of these terms
and use them in a purposeful way.

The term, *stigmatization*, originated in ancient Greece, named after the process of
branding, cutting, or *marking* the body to depict one as a slave or criminal. *Stigma* was explained
by Goffman (1963) as “an attribute that is discrediting and prevents an individual from full social
acceptance.” Additionally, Crocker, Major, and Steele (1998) described *stigma* as “an attribute
that conveys a devalued social identity across most social contexts.” Thus, obesity would be
considered a *stigma* that is overtly visible to others and prevents them from receiving social
acceptance. Fiske (1998) describes *bias* as the way “thoughts, feelings, and behaviors may be
altered because of a stigmatizing mark.” They further explain that research on biases in cognition
focus on *stereotypes*, biases in emotional reactions focuses on *prejudice*, and biases in behavior
focuses on *discrimination*. Thus, Fiske (1998) views bias as an overarching term for
*phenomenon* that arises from stigmatization. The terminology used in defining this phenomenon
is important in guiding future measurement and assessment of differential attitudes and treatment
towards the overweight stigmatizing mark. For the purpose of the current investigation, the term,
*Bias* will be used to describe differential feelings, thoughts and behaviors towards obese
individuals.

Negative biases towards the obese appear as early as preschool. Research indicates that
children are negatively biased towards those who are obese to a greater extent than children with
a variety of other disabilities (Cramer & Steinwart, 1998; Kraig & Keel, 2001; Musher-
Eizenman, Holub, Miller, Goldstein, & Edwards-Leeper, 2004). In one of the first studies to
examine weight bias among children attending public school and summer camp, participants
ranked pictures of children on likeability. The children were with crutches, in a wheelchair, with
an amputated hand, with a facial disfigurement, and obese. Children who were obese were ranked as least liked (Richardson et al., 1961). Surprisingly, the results from a recent replication (Latner & Stunkard, 2003) indicate that children’s negative biases towards obese children have worsened. Latner and Stunkard (2003) found that children continued to rank the picture of the child who was obese the lowest in likeability. Additionally, the child who was obese was liked significantly less in 2003 than in 1961, with the distance between the highest ranked child (the average weight, non-disabled figure) and the lowest ranked child (the obese figure) increasing by 41%.

Beyond likeability, research suggests that an individual’s weight status influences other people’s perceptions of their character (Brylinsky & Moore, 1994; Kraig & Keel, 2001; Musher-Eizenman et al., 2004; Neumark-Sztainer et al., 2002; Strauss, Smith, Frame & Forehand, 1985). For example, Brylinsky and Moore (1994) gave 368 children (kindergarten through fourth grade) a personality trait/behavior attribution task in which the children rated thin, normal, and overweight pictures of target children on 12 adjective poles (e.g., quiet/loud, brave/afraid, ect.). They found that there was an unfavorable perception of the “chubby” body build and a favorable perception of the average body build figure on various behavioral/personality traits. The “chubby” body build was rated significantly below the group average for all 12 adjectives.

One-hundred, thirty-one undergraduate students were asked to identify a silhouette figure out of a range of silhouette body sizes that they felt corresponded to given adjectives (e.g., lazy, motivated, slow, physically fit, unfriendly; Greenleaf, Starks, Gomez, Chambliss, & Martin, 2004)). More specifically, participants were asked to identify one out of nine figures that best represented the body shape they associated with each adjective. Their results indicated that the terms, stupid, unfriendly, and boring were more likely to be used for figures at the extreme ends
of the figure array (underweight and overweight figures) whereas the terms, *smart*, *friendly*, and *funny* were more likely to be used for figures in the center of the array (the normal weight figures). Additionally, in two studies with adults, the obese were rated as more lonely, mean, self-indulgent, unhappy, and lacking in self-discipline when compared to the non-obese (Harris & Smith, 1983; Tiggemann & Rothblum, 1988).

Because of these public perceptions, it is believed that people who are subject to poorer treatment and decreased social and economic success (Foster et al., 2002; Gortmaker, Must, Perrin, Sobol, & Deitz, 1993; Miller, Rothblum, Brand, & Felicio, 1995; Pingitore, Dugoni, Tindale, & Spring, 1994; Puhl & Brownell, 2001; Puhl & Heuer, 2009). In fact, a review by Puhl and Brownell (2001) and a more recent review by Puhl and Heuer (2009) both examining discriminatory attitudes and behaviors toward the obese concluded that people who are obese experience negative bias in a variety of settings, such as employment, education, and health care. For example, a number of studies have examined weight discrimination in the workplace and have found that, due to anti-fat biases, individuals who are obese may be at a relative disadvantage compared to their non-obese peers during the hiring process and evaluations of work performance (Decker, 1987; Klassen, Jasper, & Harris, 1993; Klesges, et al., 1990; Rothblum, Miller, & Gerbutt, 1988). Additionally, evidence suggests that anti-fat biases can negatively affect wages and promotion and increase the likelihood of termination of employees (Brink, 1988; Loh, 1993; Paul & Townsend, 1995; Register & Williams, 1990). For example, the results of an analysis of a National Longitudinal Survey Youth Cohort indicated that among 8,000 men and women ages 18 to 25, women who were obese earned 12% less than their non-obese peers (Register & Williams, 1990). Work by Rothblum, Miller, Brand, and Oetjen (1990) suggests that some employees who are obese perceive that they may have been suspended or
fired from their jobs due to their weight. According to Puhl and Brownell (2001) and Puhl and Heuer (2009), studies indicated that the economic disadvantages related to obesity seem to be specific to or at least more common to women. A survey using National Longitudinal Survey of Youth Data (N= 25,843) found that for Caucasian women, an increase of 64 pounds above average rate was associated with a decrease of 9% in wages (Cawley, 2004). Overall, a combination of lower wages, fewer high level positions, and more denial of promotions employees who are obese are suspected to be the major reasons for this economic disadvantage (Puhl & Brownell, 2001; Puhl & Heuer, 2009).

Studies on weight bias have also indicated a negative impact in educational settings for overweight children and young adults. These studies have concluded that individuals who are overweight may experience peer rejection as early as elementary school, have lower acceptance rates into college despite equivalent application rates and academic performance to non-overweight peers and receive less financial support from family members for attending college (Canning & Mayer, 1966; Crandall, 1991; Crandall 1995; Neumark-Sztainer, Story, & Faibisch, 1998). A study by Canning and Mayer (1966) found that despite equivalent College Board scores and high school grade point averages, heavier adolescents were less likely to be accepted into several prestigious colleges and universities in the Northeast. While they did not directly compare whether poorer evaluations from college interviewers and weaker recommendation letters from high school counselors occurred, they speculated that these factors contributed to the differences in acceptance rates between non-overweight and overweight adolescents. Additionally, two studies by Crandall (1991, 1995) revealed that non-overweight students are more likely to receive financial support for college from their parents than students who are overweight. Differences in family support remained after controlling for parental education,
income, ethnicity, and family size. While Crandall (1991) offered potential explanations as an alternative to discrimination (e.g., students who are obese may have received more financial aid than their non-obese peers, thus lessening the need for familial support), he felt that the most plausible explanation for these findings was parents’ negative emotional reactions towards their children who were overweight. However, it is important to note that Crandall (1991; 1995) did not directly measure parental affect towards their children who were overweight in these studies.

In the health care setting, several studies have explored health care providers’ perceptions of patients who are obese as well as their views about providing counseling, referrals, and other treatments for the management of obesity (Klein, Najman, Kohrman, & Munro, 1982; Kristeller & Hoerr, 1997; Price, Desmond, Krol, Snyder, & O’Connell, 1987). For example, Klein et al.’s (1982) mail survey to 439 physicians assessed health care providers’ attitudes towards various types of patients including patients who are obese. The questionnaire asked physicians to list five diagnostic categories and social characteristics of patients that they responded negatively to. Obesity was the fourth most common (after drug addiction, alcoholism, and mental illness) among the thousands of medical conditions listed. The physicians in this study associated obesity with poor hygiene, noncompliance, hostility, and dishonesty. Another study examined obesity management practices among 1,200 physicians and discovered that only 18% reported that they would discuss weight management with patients who were obese (Kristeller & Hoer, 1997). A majority of physicians in this study also reported that they felt ambivalent about how to manage patients who were obese and felt that they did not intervene as much as they should in regards to treating obesity. While such ambivalence may be attributed to a lack of knowledge regarding how to approach the problem, it is also possible that these results also indicate negative attitudes towards obesity in physicians or the belief that patients who are obese would be noncompliant
with instructions to lose weight. Research exploring the views of other health care providers such as nurses, dieticians, and medical students has found similar weight biases to those of physicians (Maroney & Golub, 1992; McArthur & Ross, 1997; Blumberg & Mellis, 1980). These findings raise concerns about how negative biases may affect clinical judgments of health care practitioners.

Emotional Impact of Weight Stigmatization

There is evidence that stigmatization can have powerful psychological effects on those who experience it. Kessler et al. (1999) examined data from between 1995 and 1996 in 3,024 individuals ages 25 to 74 years in general population to study perceived discrimination of any type and its association with mental health. The results of this study indicated that perceived discrimination predicted non-specific distress as well as the incidence of major depression (while controlling for socio-economic factors).

Regarding weight bias, a number of studies indicate that adolescents who are teased about their weight are more likely to display body image and eating disturbances (Cattarin & Thompson, 1994; Neumark-Sztainer, et al., 2002; Thompson, Coovert, Richards, Johnson, & Cattarin, 1995). The results of a study of 4,746 adolescents by Neumark-Sztainer, et al. (2002) indicated positive associations between weight teasing, binge eating, and unhealthy weight control methods. Therefore, perceived weight teasing was correlated with increased amounts of disordered eating in these youth. While research is limited there also appears to be some evidence of long-term negative effects of weight-based teasing in childhood (Braet, Mervielde, & Vandereycken, 1997; Grilo, Wilfley, Brownell, & Rodin; Pierce & Wardle, 1997). For example, a retrospective study by Grilo et al. (1994) found that more frequent physical appearance-related teasing (done by other children) during childhood and adolescence was
related to more negative self-perceptions of attractiveness and greater body dissatisfaction in adulthood. Likewise, Annis, Cash, and Hrabosky (2004) found that overweight, adult women reported more frequent stigmatizing experiences during childhood, adolescence, and adulthood were more likely to report poorer body image and psychosocial functioning.

Methods for Measuring Bias

A variety of methods for the assessment of weight bias have been developed in relation to differing theoretical perspectives regarding the phenomenon. These methods include explicit (e.g., self-report), implicit (i.e., measurement of attitudes outside of awareness), and behavioral measures (e.g., chosen seating proximity), all of which will be discussed.

Explicit Measures

Weight bias may differ from other forms of bias given that many in our society continue to believe that it is socially acceptable to explicitly exhibit negative attitudes towards people who are obese (Kilbourne, 1994). Thus, a majority of studies have used explicit methodology in their measurement of weight bias. Within the explicit measures of weight bias, there have been several different approaches for examining negative attitudes toward obesity. For example, weight bias may be assessed in terms of self-relevant versus global social attitudes. In other words, researchers have measured individuals’ fears of becoming fat or feelings about their own weight as well as global attitudes about individuals who are overweight or obese, respectively. The Anti-fat Attitudes Questionnaire, a popular self-report measure developed by Crandall (1994), contains subscales that assess both of these aspects of weight bias. The 13-item scale includes three subscales: dislike of fat people, fear of fat, and beliefs about the controllability of weight.
Several weight bias scales assess global attitudes towards people who are overweight as a group or attitudes that are held about specific individuals who are overweight. For example, a study by Robinson, Bacon, and O’Reilly (1993) developed the Fat Phobia Scale to assess weight bias at a group level by asking participants to endorse what “fat people are like” on a series of opposing dimensions (e.g., smart vs. stupid). Additional self-report measures that examine weight bias at the group level include two measures developed by Allison, Basile, and Yuker (1991) including the Attitudes Towards Obese Persons Scale (ATOP) and the Beliefs About Obese Persons Scale (BAOPS; measures to what extent one believes obesity is personally controllable). The Obese Persons Trait Survey (OPTS) was developed by Puhl, Schwartz, and Brownell (2005) and asks participants to estimate the percentage of people who are obese who possess 20 given traits, 10 of which are negative and 10 of which are positive. Other studies (Bagley, Conklin, Isherwood, Pechiulis, & Watson 1989; Price, Desmond, Ruppert, & Stelzer, 1989) have developed explicit self-report measures to assess health care providers’ attitudes towards patients who are obese. Harris, Walters, and Waschull, (1991) and Teachman, Gapinski, Brownell, Rawlins, and Jeyaram (2003) also developed explicit, self-report measures to examine weight attitudes at the group level.

Conversely, other studies measure beliefs about specific individuals who are obese by presenting vignettes or drawings depicting various physiques and subsequently asking the participant to rank the individual who is obese based on preference or rate them on various characteristics (Bell & Morgan, 2000; Counts, Jones, Frame, Jarvie, & Strauss, 1986; Dejong, 1980; Dejong, 1993; Harris, Harris & Bochner; Menec & Perry, 1998; Richardson, Goodman, Hastorf, & Dornbusch, 1961; Sigelman, 1991; Staffieri, 1967; Rodin, Price, Sanchez, & McElligot, 1989; Rush, 1998; Weiner, Perry, & Magnusson, 1988). Multimedia methodology
has also been utilized in order to present participants with hypothetical targets. For example, Dejong (1993) showed adolescents a videotape of an obese or non-obese confederate playing a game and performing at either above or below average. While studies using this methodology consistently indicate significantly more negative biases towards individuals who are obese, no previous research has compared how biases may differ when assessed at group level versus individual level.

Within the research on explicit measurement, researchers have identified various dependent variables as potential indicators of stereotypes, prejudice, and discrimination of people who are obese. Three studies (Menec & Perry, 1998; Rush, 1998; Weiner, Perry, & Magnusson, 1988) asked participants to read about hypothetical characters (both obese and non-obese) in a vignette and subsequently rate their own anger and pity towards the character as well as their willingness to assist them. Other studies have asked participants to rate target characters on performance and competence while only manipulating weight status as a measure of bias (Dejong, 1993). Likeability has also been identified as a variable that may indicate bias and thus used in studies measuring weight bias (Crandall & Moriarty, 1995; Dejong, 1993; Dejong, 1980; Weiner et al., 1988; Rush, 1998; Bell & Morgan, Musher-Eizenman, Holub, Barnhardt Miller, Goldstein, & Edwards-Leeper, 2004).

Based on the idea that characterological information may be insinuated based on appearance, previous studies have also measured participants’ perceptions of obese individuals’ behavior and personality traits and compared them to those of non-obese targets as a measure of bias (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000; Brylinski & Moore, 1994; Counts, et al., 1986; Dejong, 1980; Harris, et al., 1982; Kraig & Keel, 2001; Lerner & Korn, 1972; Musher-Eizenman et al., 1994; Sigelman, 1991; Puhl et al., 2005; Staffieri, 1967; Teachman et al., 2003;
Tiggemann & Annesbury, 2000). For example, many explicit measures used with children have
employed personality trait/behavior attribution tasks in which participants rate underweight,
average, and overweight pictures of targets on 12 adjective poles (Brylinski & Moore, 1994;
Counts, et al., 1986; Harris, et al., 1982; Kraig & Keel, 2001; Lerner & Korn, 1972; Musher-
Eizenman et al., 2004; Staffieri, 1967). Other studies use a forced-choice questionnaire format in
which children are required to choose which body type is most likely to possess a given attribute
(Anesbury & Tiggernann, 2000; Tiggmermann & Anesbury, 2000; Turnbull, Heaslip, McLeod,
2000). Finally, some studies employ a rank-order technique, where participants are asked to
rank-order pictures of targets with various disabilities (including obesity) on various attributes
and preferences (Maddox, Back, Liederman, 1968; Richardson, 1971; Richardson, et al., 1961).
Conclusions across these methods are consistent in that individuals who are obese are ascribed
negative adjectives more often, are rated more negatively on adjectives poles, and are ranked
lower in preference, which is suggestive of negative bias of the overweight figures or individuals
in question.

*Implicit Measures*

There is evidence to suggest that weight bias can occur without the perceiver’s awareness
or intent and can differ significantly from their reported explicit views. In other words,
researchers believe that anti-fat views can be expressed explicitly through conscious self-report
as well as implicitly, such as through reaction times to stimuli (described below). Research has
revealed that there is often little association between explicit and implicit biases (Bessenoff &
Sherman, 2000; Teachman & Brownell, 2001; Teachman et al., 2003). This may occur as a result
of the implicit, unconscious nature of the biases. For example, participants may not be aware of
their views enough to report them on explicit measures or they may deny implicitly held views
due to social desirability or a desire to hold more favorable views. It is important to note that implicit measures of bias yield consistently higher estimates of anti-fat bias among participants than do explicit measures (Bessenoff & Sherman, 2000; Teachman et al., 2003). Additionally, Teachman et al. (2003) found that implicit beliefs were equally resistant to change in a positive direction as explicit beliefs but implicit beliefs were also more likely to be influenced negatively than explicit beliefs were.

Several methods have been used to demonstrate implicit biases and how they differ from explicit views. Bessenoff and Sherman (2000) found that implicit weight bias as measured by a lexical decision task predicted behavioral outcomes (e.g., chosen seating distance from an overweight confederate), but did not predict explicitly reported views.

The Implicit Associations Test (IAT; Greenwald, McGhee, & Schwartz, 1998) has been used to study implicit attitudes related to social prejudice and has recently been applied to research on weight bias (Grover, Keel, & Mitchell, 2003; Teachman & Brownell, 2001; Teachman et al., 2003). The IAT is based on the idea that stimuli classification is facilitated and thus faster when category pairs match implicit associations. Therefore, participants are expected to categorize stimuli faster when categories are paired in such a way that matches the way concepts are already related in their minds. Processing speed is used as an indirect measure of an individual’s association between two concepts (i.e., obesity and negative stereotypes). It is important to note that this method assumes that the stronger a person’s implicit association, the stronger their implicit attitude. Studies using the IAT have also found evidence of implicit anti-fat bias across multiple populations (Grover et al., 2003; Teachman & Brownell, 2001; Teachman et al., 2003).
Behavioral Indicators

As an alternative to measuring explicit, self-reported biases or implicit views, some researchers have focused on direct measurements of behavioral rejection of people who are obese (e.g. time before salespersons respond to overweight customers; Pauley, 1989) as a proxy for negative biases. This form of measurement, examined in small (e.g., measuring the distance one chooses to sit from an overweight confederate; Bessenoff & Sherman, 2000) and large scale investigations (e.g., surveys), demonstrate relationships between weight and important variables such as wages and education (Register & Williams, 1990). Other studies have conducted experiments in which obese and non-obese confederates engaged in various activities (e.g., applying for a job or inquiring about renting apartments) to determine if discrimination occurs in important life areas (Karris, 1997, Pingitore, Bernard, Dugoni, Tindale, & Spring, 1994). Studies using behavioral measurement have consistently found evidence for a strong negative bias towards individuals who are obese.

Theories behind Anti-Fat Bias

The fact that people exhibit bias toward people who are obese is consistent with numerous studies showing that people form ideas about others based on physical appearance. In fact, people consistently hold strong (and often incorrect) beliefs that physical characteristics are related to psychological traits (Dion, Berscheid, & Walster, 1972; Feingold, 1992). While people may evaluate and make assumptions about others based on appearances, the question remains as to why obesity, specifically, has been targeted as a stigma, leading to negative, biased beliefs, emotions, and discriminatory behavior towards the obese population. Several theories exist that may explain negative bias toward individuals who are obese and identify ways to change these views.
For the purpose of this review, the Realistic Conflict, Social Identity, and Evolutionary, Attribution, and Social Consensus, theories will be briefly discussed. Realistic Conflict Theory suggests that negative biases arise from conflicts of interest between groups and from efforts to retain power and resources (Sherif, 1958). While it has been suggested that this theory may be applicable to weight biases (Puhl & Brownell, 2003), there is currently no evidence to suggest this and Realistic Conflict Theory does not explain a number of phenomenon related to weight bias (e.g. why obese people display negative biases towards other obese people).

Social Identity Theory proposes that people self-categorize into social groups in order to form positive social identities and that negative biases occur in order to maintain the social groups (Tajfel & Turner, 1986). Specifically, members of other groups are judged to be inferior on attributes that are valued by the in-group in order to maintain these positive social identities. According to Puhl & Brownell (2003), this theory may provide some explanation for downward comparisons of individuals who are obese, but does not explain why they came to be viewed as inferior in the first place or, as with Realistic Conflict Theory, why there is self-stigmatization among people who are obese (leading to damage of their own in-group identity).

Evolutionary theory has also been applied to the phenomenon of weight bias. According to Neuberg, Smith, and Asher (2000), negative biases against people who are obese can be understood as having adaptive significance. More specifically, they argue that group living is essential for adaptation and survival and thus, stigma serves the purpose of labeling individuals who undermine group functioning for the purpose of identifying who should be denied social acceptance. According to Puhl and Brownell (2003), there is a lack of evidence for an evolutionary explanation for weight bias. One argument against the application of this theory
asserts the idea that anti-fat attitudes may be a relatively recent phenomenon, making evolutionary perspectives on the problem less likely to be applicable.

Attribution theory is currently the most empirically tested approach aimed at understanding weight bias. Puhl and Brownell (2003) describe attribution theory as people’s attempt to search for information underlying the causes of uncertain outcomes, which is subsequently used to inform impressions and expectations about groups of individuals. For most people, internal and controllable causes are assumed to underlie the condition of obesity within attribution theory (i.e., overeating and lack of physical activity; Crandall, 1994). Thus, when obesity is believed to be an entirely controllable condition, individuals who are overweight are perceived as responsible for their weight problem, and thus perceived to be self-indulgent, lazy, or engaging in out-of-control impulses and behaviors (Puhl & Brownell, 2001).

Research focusing on the role of causal attributions and controllability beliefs regarding obesity has consistently found that holding obese persons responsible for their weight is related to increased negative biases. Studies using a correlational design have shown that individuals’ beliefs about the controllability of obesity (i.e., whether the cause of the obesity was within the control of the target through diet and exercise or brought about by external factors such as biogenetic disorders) are positively correlated with negative biases towards people who are obese (Allison et al., 1990; Crandall & Moriarty, 1995; Mushar-Eizenman et al., 2004; Quinn & Crocker, 1999; Tiggemann & Anesbury, 2000).

Experimental designs have also been employed in which researchers manipulate causal information presented to participants while measuring subsequent changes in weight bias (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000; Crandall, 1994; Crandall & Moriarty, 1995; Dejong, 1993; Dejong, 1980; Geier, Schwartz, & Brownell, 2003; Lewis et al., 1997;
Menec et al., 1998; Puhl et al., 2005; Rodin et al., 1989; Rush, 1998; Sigelman, 1991; Teachman et al., 2003; Weiner et al., 1988; Wiese et al., 1992). Five studies compared a control group to a group in which participants were given information that obesity is controllable by means of exercise and/or dieting (Geier et al., 2003; Lewis et al., 1997; Puhl et al., 2005; Teachman et al., 2003; Weiner et al., 1988). Out of these five studies, four (all with the exception of Geier et al., 2003) found that giving information that obesity is controllable made weight biases more negative than baseline.

Eleven studies compared control groups to groups in which participants were given information that obesity is uncontrollable due various biogenetic reasons (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000; Crandall, 1994; Dejong, 1993; Dejong, 1980; Lewis, et al., 1997; Puhl et al., 2005; Sigelman, 1991; Teachman et al., 2003; Weiner et al., 1988; Wiese et al., 1992). Five out of eleven (Anesbury & Tiggemann, 2000; Bell & Morgan, 2000; Lewis et al., 1997; Sigelman, 1991; Teachman et al., 2003) studies found no significant improvements in participants’ attitudes towards the overweight above baseline when presented with information that obesity is uncontrollable. Finally, four studies (Crandall & Moriarty, 1995; Menec et al., 1998; Rodin et al., 1989; Rush, 1998) compared a group in which participants were given information that obesity is controllable to a group in which uncontrollable information was given (no control groups were used). All four of these studies found significantly more negative biases towards the obese in the groups in which controllable information compared to those in which uncontrollable information was given. While the results of these studies are mixed and dependent measures of weight bias varied considerably, a majority of their findings indicate that it is much more difficult to shift weight biases in a positive direction than it is shift weight bias in a negative direction, at least when attributions of controllability are manipulated.
Social Consensus theory has recently been applied to explain weight bias. This theory stresses how our own attitudes, beliefs, and behaviors are shaped by others, particularly those whose opinions we care about (Asch, 1952, Turner, 1991). In other words, people’s opinions can be influenced by what they perceive other people believe. For example, important opinions such as one’s political orientation, college aspirations (Epstein, 1983; Newcomb, 1943) or even more trivial matters such as judgments about the length of a line (Asch, 1952) may be influenced in this manner. This view also explains stigma, at least in part, as a function of how one perceives the stigmatizing beliefs of others. It asserts that when people perceive that their attitudes are shared by others, this may increase confidence and perceptions of group cohesiveness (Sechrist & Stangor, 2001; Stangor, Sechrist, & Jost, 2001). Social Consensus theory claims that biases develop as a result of group pressures to conform to group norms and standards. Also, it asserts that groups punish or reject those who deviate from the group values. The idea that biases regarding certain groups of people may be developed and maintained by consensus information originated from Sherif and Sherif’s (1953) group-norm theory. This theory asserts that group members learn appropriate attitudes and behaviors from one another and group members are pressured to conform to group norms and standards. Those that do not conform to the standards are ostracized and punished.

Experiments have been conducted to support this theoretical perspective and to demonstrate the influence of social consensus information on intergroup beliefs (Haslam et al., 1996; Sechrist & Stangor, 2001; Stangor et al., 2001; Wittenbrink & Henly, 1996). For example, Stangor et al., (2001) asked European American participants to estimate positive and negative traits held by African Americans. Subsequently, they were given fabricated feedback indicating that other students were either more or less favorable in their evaluations of African Americans.
Following this manipulation, participants were asked to estimate traits held by African Americans again. Stangor et al. (2001) found that participants’ estimates of traits were significantly shifted in the positive direction when they were given feedback that others were more positive than them and their attitudes were significantly shifted in the negative direction when they received feedback that others’ were more negative.

Social consensus theory also asserts that individuals’ attitudes will be most influenced by information regarding perceived attitudes of groups that they value or an “in-group.” According to Puhl et al. (2005), individuals are motivated to maintain their relationships within valued social groups. Indeed, a second experiment within Stangor et al.’s (2001) study demonstrated that social influence affects attitudes more strongly when individuals perceive that information about group attitudes is coming from an in-group rather than an out-group. More specifically, they found that when students were provided with consensus feedback that was reported to be from either the same college (in-group) or a rival college (out-group) and found that stereotypical beliefs were more influenced if participants had previously learned about attitudes from the in-group versus out-group source.

Social Consensus theory does not explain how people who are obese came to be maligned. However, given the common negative portrayals of people who are obese in our media and popular-culture, people may assume that others share these negative views towards individuals who are obese regardless of contrary evidence that they may encounter in their lives (e.g., examples of people who are obese in their lives that do not fit these stereotypes). Social Consensus influences fueled by negative media portrayals of individuals who are obese may partially explain the widespread nature of weight bias and may be relevant for future research aimed at changing negative attitudes towards this population.
Evidence that social consensus information can influence weight bias was found by Puhl et al. (2005). Puhl et al., (2005) tested the effect of perceived social consensus on attitudes toward individuals who are obese by requiring participants to complete self-report measures before and after manipulated consensus feedback depicting attitudes of others. To accomplish this, Puhl conducted a series of three experiments that closely follow methods used by Stangor, Sechrist, and Jost (2001; discussed in the previous paragraph). In the first experiment, Puhl et al. (2005) sought to determine whether consensus information could significantly increase participants’ estimates of positive traits and/or decrease their estimates of negative traits possessed by individuals who are obese. Results of this experiment confirmed that when participants were given feedback that other students’ attitudes were more favorable towards people who are obese than their own, participants’ estimates of negative traits held by obese individuals (e.g., lazy, undisciplined, gluttonous, self-indulgent) decreased significantly and their estimates of positive traits held by people who are obese (e.g., honest, generous, sociable, productive) increased significantly. However, there was no change in participants’ attitudes when they were given feedback about other students’ unfavorable views of obese individuals. Puhl et al. (2005) asserted that change in the negative direction was likely not produced due to the fact that participants’ ratings were quite high (negative) at the beginning of the experiment, creating a ceiling effect.

Puhl’s second experiment examined whether participants’ attitudes towards people who are obese could be further improved if they learned about favorable attitudes of the obese from an in-group rather than an out-group source. Thus, participants (undergraduate students at Yale University) in this experiment were either provided with favorable consensus information regarding people who are obese from “Ivy League students” (in-group) or “community college
students” (out-group). Results from this experiment indicated that favorable consensus feedback has more influence on reported attitudes when it comes from an in-group versus an out-group source.

Puhl et al. (2005) conducted a third experiment in which they compared providing consensus information with four other attitude change methods in order to modify attitudes towards people who are obese. Participants received either favorable consensus information (from an in-group source), information purportedly documenting the “true prevalence of traits among obese people according to scientific research” (referred to as the trait prevalence condition), a vignette emphasizing the uncontrollable causes of obesity, a vignette focused on the controllable nature of weight (overeating and lack of exercise as causes of obesity), or no information (control group). A within and between subjects design was employed and participants were measured before and after each manipulation. Surprisingly, the results of the experiment did not support the hypothesis that social consensus feedback would be the most effective in altering participants’ beliefs. Rather, the social consensus and trait prevalence conditions significantly increased estimates of positive traits and decreased estimates of negative traits in participants when comparing data from time one and time two. Even more unexpectedly, when Puhl et al. (2005) conducted planned comparisons to determine which conditions brought about the most change in participants’ attitudes from time one to time two, the results revealed that the trait prevalence condition significantly increased participants’ estimates of positive traits more than providing favorable consensus or controllability information did. In fact, it was found that there was significant change in the trait prevalence condition for all 20 positive and negative traits assessed in this experiment. Additionally, social consensus, trait prevalence, and controllability information were equally effective at decreasing participants’ estimates of
negative traits. Thus, Puhl et al. (2005) included a manipulation in their study that would unknowingly affect change in attitudes towards obesity in a manner above and beyond previously used experimental techniques.

Puhl et al. (2005) reported that they included the trait prevalence manipulation in their study in order to compare two types of social influences on participants’ estimation of positive and negative traits. According to Puhl et al. (2005), the findings of their study highlight potential differences between normative social influence, which reflects conformity based on a desire to gain approval or avoid disapproval from groups of others and informational social influence, which reflects the acceptance of information from others as evidence of “truth or reality”. They report that the trait prevalence condition in their study was a manipulation of informational social influence while their social consensus condition was a manipulation of normative social influence as a means for changing attitudes. Additionally, they suggested that combining these two types of social influence may result in greater attitude change than when either approach is used separately. While there was little more elaboration by Puhl et al. (2005) regarding the theoretical underpinnings of their unexpected findings, prior research highlights the differences between these two types of social influence (Deutsch & Gerard, 1955).

Deutsch and Gerard (1955) delineated the difference between informational and normative social influence, though, in contrast to Puhl et al (2005), the former was the focus of their study. They asserted that normative social influence stems from an individual’s desire to gain approval or avoid disapproval from groups of others. Individuals may engage in behaviors or report perceptions that they do not necessarily believe internally in order to gain group approval. Therefore, conformity with a group under normative social influence refers to the individual’s desire to avoid disapproval or gain group acceptance. Asch (1952) was the first
psychologist to study normative social influence in the laboratory. In his series of studies, Asch (1952) exposed participants in a group to a series of lines, and they were asked to match one line with another out of a group of different lengths. The correct answer was very clear in the 18 trials. All members of the group (except for the one participant) were confederates in the experiment and were secretly told to give the wrong answer in 12 of the 18 trials. The results showed a surprisingly high degree of conformity on the part of the participant. Seventy-six percent of the participants conformed on at least one trial. On average, people conformed one third of the time, even though their answers were clearly wrong. Participants in this study were asked to report their views in a non-anonymous environment and were highly influenced by group expectations and the desire for approval especially given the clarity of the task. While the latter experiment demonstrated the power of normative social influence (i.e., gaining approval or avoiding disapproval) to affect individuals’ reported judgments, a different kind of social influence can simultaneously occur.

According to Deutsch and Gerard (1955), informational social influence pertains to seeking information from social sources that a person decides to believe as a reflection of reality, based on opinions of trustworthy sources. Specifically, this type of social influence is particularly strong when a person is required to make a judgment in an unfamiliar or ambiguous situation. In these kinds of situations, a person may look to a trustworthy source (e.g., a unanimous consensus among a group, an expert opinion). When a person is persuaded through informational social influence, they are motivated to be correct or accurate in the given situation rather than to simply conform to a group for social approval. If a group holds a consensus decision, informational social influence may lead the individual to believe that the group is correct based on the popularity of a judgment.
Deutsch and Gerard (1955) explained that normative and informational social influences often operate together in situations in which group processes impact individuals’ attitudes. In other words, people are often motivated to conform to a group’s beliefs and to be correct. Indeed, even in Asch’s (1952) experiments in which normative social influence was a very powerful manipulation, informational social influence could not be completely ruled out as a potential motivation for change in participants’ answers. However, they note that it is possible for a person to conform with the beliefs of others behaviorally, even if they are acting in a discrepant manner from their true beliefs (normative social influence) or it is possible for a person to accept another person’s beliefs about reality even if they don’t have a motivation to agree with them (informational social influence). Thus, these two types of social influences may occur exclusively.

Regarding Puhl et al. (2005), the question still remains as to which type of social influence, normative or informational, the conditions, social consensus and trait prevalence, actually assessed. Again, the authors assert that the social consensus condition relied primarily on normative social influence, whereas the trait prevalence condition relied on informational social influence to change beliefs. A review of the nature of these influences does not seem to support Puhl’s interpretation of their findings. Rather, it indicates the need for further investigation to understand the way in which normative and informational social influence might affect participants’ bias. Using anonymous feedback techniques regarding in group members’ beliefs such as those employed by Puhl are likely to be a weak test of normative social influence and does not rule out an equally plausible informational social influence interpretation. Arguably, a non-anonymous experiment using social consensus information (e.g., an individual hears other in-group people provide their beliefs and then the individual is asked their opinion)
would have been a more powerful examination of normative social influence. However, receiving information about how their peers estimated traits held by obese others may have provided a basis for them to establish a sense of validity or correctness (i.e., informational social influence). In other words, individuals may conclude “how could a majority of people be wrong?” The participants in Puhl et al’s (2005) social consensus condition might have concluded that the opinions of an in group source were accurate reflections of reality. Thus, it could be easily argued that Puhl et al’s (2005) social consensus condition relied on both informational and normative social influence to change participants’ beliefs, rather than strictly normative social influence. In fact, it is plausible that because Puhl et al’s participants had very little at stake socially and were driven more by a desire to be correct than they were by social approval.

In regards to Puhl et al’s (2005) trait prevalence condition, the effects of this manipulation is likely to have very little to do with the effects of normative social influence on attitude change. There is little evidence that normative social influence or any other social phenomenon was occurring in Puhl et al’s (2005) trait prevalence condition. For example, the feedback given to participants in this condition read, “Extensive research using testing at Yale University has revealed that for each of the following traits, the identical percentage of obese individuals possesses this particular trait in the general population.” Given the results of Puhl et al (2005), a plausible alternative interpretation of their findings is to conclude that people seek to be correct through either scientific trait prevalence data or informational social influence, particularly when the cost of disagreement with an in group is minimal. Normative social influence is likely to gain strength under conditions where there is public disagreement with an in group or that disagreement with a highly cohesive in group has large potential social costs.
CHAPTER II. THE PRESENT STUDY

The objective of the present study is to test the effects of different types of influence (social and non-social) on the expression of stereotypes toward individuals who are obese. This research aims to replicate and extend the work of Puhl et al. (2005) who first used social consensus information to change attitudes toward people who are obese. Based on the findings of this previous research, an important next step will be to determine whether adding non-anonymous feedback to a social consensus condition will have a greater impact on changing participant’s negative attitudes toward people who are obese. In other words, I aim to answer the question of whether asking people to voice their opinions publicly in a manner that introduces social cost (i.e., increased normative social influence) when they do not conform to the group opinion will cause attitude change beyond that of providing anonymous feedback on people’s views (as in the social consensus condition in Puhl et al., 2005). Additionally, it will important to compare the effects of providing social consensus information (both anonymous and non-anonymous) with a condition in which participants are given scientific information about base rates of others’ beliefs (such as the trait prevalence condition in Puhl et al., 2005). I am also interested in exploring the motivations behind individuals’ potential attitude changes in regards to views on people who are obese, namely whether these changes stem from a desire to be accurate and/or a desire to be accepted and included into an in group. The final purpose of this investigation will be to compare changes in people’s attitudes toward people who are obese following the experimental manipulations mentioned above on both explicit and implicit bias.

Hypotheses

(See Table 6 for a summary of the following hypotheses)

1. Public feedback compared to anonymous feedback
The social consensus conditions utilized in previous studies have relied on methodology in which participants remain anonymous in their ratings of the traits that obese individuals possess (Puhl et al., 2005; Stangor et al., 2001). Additionally, these studies provided consensus feedback in written form such that participants did not interact with individuals of differing opinion. While this methodology produced significant changes in participants’ attitudes in previous studies (Puhl et al., 2005; Stangor et al., 2001), it is possible that a public feedback condition in which participants are asked to express beliefs publicly (that only a week prior failed to conform to group opinion) will have greater potential social costs and will be more effective in changing attitudes. Therefore, by introducing potential public disagreement into the trait feedback condition, normative social influence may become a persuasive agent in addition to informational social influence. As noted earlier, the traditionally used, anonymous feedback condition is likely to be a weak manipulation of normative social influence and, in fact, may primarily rely on informational social influence to change attitudes. Therefore, I predicted that a public feedback condition in which participants did not remain anonymous in their opinions would produce more change in attitudes toward people who are obese than in a traditional, anonymous feedback condition.

2. Public Feedback compared to trait prevalence information

Puhl et al. (2005) speculated that a manipulation of social feedback would be a powerful means of changing attitudes toward people who are obese. While they unintentionally demonstrated the power of providing trait prevalence information in comparison, it seems highly likely that a more powerful manipulation of normative social influence, namely in a manner that does not provide the participant anonymity, would support Puhl et al.’s (2005) original hypothesis. Indeed, work done by Asch (1952) provides support for this idea in that he found a
profound movement toward majority opinion in a series of studies conducted on judgment and
decision making in (non-anonymous) group contexts. Therefore, I hypothesized that participants
in a condition in which normative social influence was introduced in a public manner would
demonstrate more attitude change than those who receive trait prevalence information.

3. Anonymous feedback compared to trait prevalence information

   Based on previous evidence (Puhl et al., 2005), providing participants with reportedly
objective information about views of in-group members regarding the prevalence of positive and
negative traits held by obese people was an effective means of influencing weight bias in a
positive direction. In fact, while Puhl et al. (2005) did not predict this outcome, the trait
prevalence condition produced more significant changes in participants’ attitudes toward people
who are obese than the public feedback condition. When replicating this condition in the current
study, I predicted that giving participants purportedly scientific evidence regarding the
prevalence of traits in the obese population would be a more effective means of attitude change
than the traditional, anonymous feedback condition.

4. Experimental groups compared to control group

   Results from previous evidence suggested that all of the experimental methods, including
anonymous feedback, trait prevalence feedback, and public feedback would influence
participants’ reported views such that their ratings across time would become significantly less
biased than the control group’s ratings across time (Puhl et al., 2005).

5. Confidence ratings

   While Puhl et al. (2005) measured participants’ confidence in their own ratings of traits
possessed by people who are obese, results were not reported in regards to its relationship to
bias. In the current investigation, it was hypothesized that participants’ confidence ratings would
be inversely related to how much they were influenced by feedback. Therefore, in the trait
prevalence, public feedback, and anonymous feedback conditions, confidence was predicted to
be negatively correlated with change in biases from phase 1 to phase 2. In other words, people
who were less confident in their judgments at baseline were hypothesized to be more easily
influenced by information regarding what other people believe or regarding scientific evidence.
6. AFAQ as a different measure of explicit bias

The Anti-Fat Attitudes Questionnaire (AFAQ) was given to participants as an additional
measure of explicit weight bias not included as part of the experimental manipulation. In
addition, AFAQ distinguishes self-referencing anti-fat attitudes and beliefs about controllability
of overweight. In each phase, the AFAQ was given to participants following the Obese Persons
Trait Survey (OPTS) and Implicit Associations Test (IAT). It was hypothesized that changes in
bias due to experimental manipulation would be reflected as decreased bias on the AFAQ.
Therefore, changes in AFAQ scores were predicted to be significantly related to changes on the
OPTS over time. Participants who decreased their bias scores over time were assumed to be
motivated to do so on the AFAQ as well. Therefore, change in explicit bias as measured by the
OPTS was predicted to generalize to other forms of explicit bias in the current study (such as
self-referencing and controllability beliefs). However, given that implicit and explicit measures
are rarely associated with each other, it is hypothesized that changes on the AFAQ would not be
associated with changes on the IAT.

6. Implicit and explicit measures of changes in weight bias

A. Previous literature has found little association between implicit and explicit measures
of anti-fat bias (Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Greenwald & Banaji,
1995; Teachman et al., 2003). It has been speculated that this lack of a relationship may occur
due to a lack of awareness about one’s own biases or because people may be motivated to deny biased responses in a socially desirable manner (Teachman et al., 2003). Regardless, it has been found that implicit measures of bias yield consistently higher estimates of anti-fat bias among participants than do explicit measures (Bessenoff & Sherman, 2000; Teachman et al., 2003). Therefore, I hypothesized that an implicit measure of bias would reveal anti-fat attitudes in the present study and would not be highly associated to measures of explicit anti-fat bias.

B. In regards to attitude change, Teachman et al. (2003) found that implicit beliefs are more likely to be influenced in a negative direction than explicit beliefs but are equally resistant to change in a positive direction as explicit beliefs. However, Teachman et al. (2003) manipulated attitude change in an anonymous manner and was not testing the effects of social influence on attitude change. Teachman et al. (2003) may have employed a relatively weak manipulation of explicit and implicit beliefs when attempting to modify beliefs in a positive direction (i.e., inducing empathy and controllability information). However, it was thought to be possible that stronger manipulations of participants’ attitudes (i.e., in the trait prevalence or public feedback conditions in the current investigation) might reveal positive changes in biases at both implicit and explicit levels. Therefore, I hypothesized significant change in the positive direction for both implicit and explicit beliefs in the public feedback and trait prevalence conditions. However, because of their automatic and unconscious nature, implicit beliefs were thought to be more resistant to change than explicit beliefs.

7. Social desirability and anti-fat attitudes

While a measure of social desirability used in Puhl et al. (2005) was not associated with baseline, post-manipulation measures of weight bias, or with changes in weight bias across time, it was thought to be possible that attitude change in the PF condition might be significantly
higher in individuals with high social desirability compared to the other three conditions (i.e., control group, anonymous feedback, trait prevalence) as a result of the high social cost involved in the manipulation. Therefore, it was hypothesized that only within the public feedback condition, baseline social desirability would be positively associated with change in explicit bias over time.

8. Motivations for potential attitude change

   A. I hypothesized that when participants are given information regarding other participants’ estimates of prevalence of traits among individuals who are obese, if attitude change did occur, it would most likely be motivated by a desire to be accurate compared to other motivational factors such as a desire to be consistent with others’ beliefs in order to be accepted. It seemed reasonable to assume that this type of information would appeal to participants’ desire to accurately reflect reality in their own beliefs about other social groups. Therefore, I predicted that participants in the trait prevalence condition would report significantly more informational social influence (both in open and closed question format) on the motivational measure than in other conditions.

   B. I also predicted that participants who were given information about others’ beliefs from an ingroup source in an anonymous context would also be motivated towards attitude change out of a desire to be correct or accurate in their beliefs compared to other motivational factors (e.g., a desire to be consistent with others’ beliefs in order to be accepted). While they were thought to report concern about not being consistent with others’ beliefs, I predicted that their primary motivation towards change would have been facilitated by informational social influence rather than normative social influence. Therefore, I hypothesized that participants in
the anonymous feedback condition would report more informational social influence than those in the public feedback or control conditions.

C. Finally, I hypothesized that those participants who were given information about other in group members’ beliefs in a non-anonymous context such that social cost was introduced would report changes in attitude beliefs due to concern for others’ views of them or (i.e., normative social influence) compared to other motivational factors (e.g., a desire to be accurate). Therefore, I predicted that participants in the public feedback condition would endorse higher normative social influence on the motivational measure than those in the other three conditions.

For the remainder of the present study, the following acronyms will be used to identify the different conditions in the study: public feedback (PF), anonymous feedback (AF), and trait prevalence (TP).
CHAPTER III. METHODS

Participants

Participants for the current investigation included 158 students recruited from introductory and developmental psychology courses at Bowling Green State University. The sample was 63% female, 85% Caucasian, and the mean age was 19 years old (see Table 1). Students were given course credit in return for their participation in the experiment. Participation took place in two sessions, one week apart for all conditions. A one week interval between phase 1 and 2 is consistent with previous utilizing social consensus feedback (Puhl et al., 2005; Stangor et al., 2001). Participants were given one unit of credit for each phase of the experiment that they completed and those that completed both phases were also entered into a drawing for a $50.00 gift certificate to a local electronics store.

Study Design

The current investigation’s participants were recruited into four conditions (described in greater detail below), including a control group, a trait prevalence feedback group (TP; Puhl et al., 2005), an anonymous feedback group (AF; following the methodology of Puhl et al., 2005), and a public feedback group (PF) using two different methods. Participants in the AF, TP, and control group were recruited from one introductory psychology course and one developmental psychology course, each taught by the same instructor. An experimenter recruited participants in the AF, TP, and control group by announcing the study during class time and that they would have the opportunity to participate in the study after class the following week. The experimenter recruited participants for the PF by announcing the study during class time and directing students to a website where they could sign up for specific times they may participate in the study. Once
these participants filled out an electronic questionnaire online, they were contacted by email with specific instructions on the location and time of the scheduled experiment.

The trait prevalence feedback (TP), anonymous feedback (AF), and control group were administered baseline measures together in a group format (developmental students in one group and introductory students in another). Participants were all told that the current investigation examines perceptions of different groups and that they were going to be asked to make judgments about a particular social group. Additionally, participants were told that they would be completing questionnaires that had been randomly selected by a computer out of a larger set of questionnaires that were being administered to many different groups of students. It was explained that because a computer arbitrarily generated these measures, they might have to complete the same questionnaire more than once. They were told that if this happens, they should simply think about the questions once more and complete the measure again. Participants in these three conditions first completed the Obese Persons Trait Survey (OPTS) followed by the Implicit Associations Test (IAT), a timed task for which it is necessary to administer group members simultaneously. The remaining two measures (MCSDS, AFAQ) were completed in counterbalanced order. Participants in the TP, AF, and control group conditions were told that some participants were going to receive feedback regarding the answers they provided on their surveys in one week.

Exactly one week later the anonymous feedback (AF), participants were given written feedback purportedly documenting “the average percentage ratings of other students who believed that obese people possessed each of the different positive and negative traits.” AF participants learned that other students had estimated that a higher percentage of obese people possessed positive traits and a lower percentage of obese people possessed negative traits, as
compared with their own responses the week before. In reality, each participant in this condition received unique feedback constructed according to their ratings from the prior week (see Appendix B). An average of 20 points was added to each participant’s percentage ratings of positive traits and an average of 20 points were subtracted from percentage estimates of negative traits. Thus, a number set was created in which a fixed number of points was added or subtracted from each of the 20 OPTS items completed by a participant (See number set 3 in Appendix D). Additionally, pre-determined decision rules were created to address situations in which a participant gave an estimate during phase 1 that would result in values below 0 or above 100 if the set formula were followed.

To be sure that the participants attended to the feedback information participants in the AF were asked to report how surprised they were by this information on a Likert rating scale (1 = not at all surprised, 9 = extremely surprised). After the participants read their feedback sheets, they were given the measures from the previous week once more. Again, the OPTS was administered first, followed by the IAT. The remaining measures were given in counterbalanced order. Following the administration of the measures for the second time, participants were debriefed and then given a short measure to assess motivation for attitude change.

In the public feedback condition (TP), participants were given written feedback purportedly documenting the “actual prevalence of these characteristics among obese individuals, as determined by scientific research”. However, this information was also constructed feedback according to their ratings from the previous week (See Appendix C). Thus, the same method used with the AF group was also used in the TP group with the only difference

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1 If the addition for positive traits puts the estimate over 100%, continue subtracting 5 from the added number until the result is under 100%.

If subtracting a certain amount for negative traits puts the number under 0, continue adding 5 to the subtracted number until the result is over 0.
being that participants learned that the traits in the obese population were an average of 20 points higher for positive traits and 20 points lower for negative traits (see number set 3 in Appendix D). Again, to be sure that the participants attended to the feedback information, they were asked to report how surprised they were by this information on a Likert rating scale (1 = not at all surprised, 9 = extremely surprised). After the participants read their feedback sheets, they were given the measures from the previous week once more. Again, the OPTS was administered first, followed by the IAT. The remaining measures were given in counterbalanced order. Following the administration of the measures for the second time, participants were debriefed and then given a short measure to assess motivation for attitude change.

In the control group, participants received written information stating that the study was researching attitudes regarding different groups of people and reminded that they may be required to complete the same survey twice. Participants in the control group were not given feedback regarding their previous week’s ratings or assessed for surprise regarding any feedback. After the participants read their written information, they were given the measures from the previous week once more. Again, the OPTS was administered first, followed by the IAT. The remaining measures were given in counterbalanced order. Following the administration of the measures for the second time, participants were debriefed and then given a short measure to assess motivation for attitude change.

Participants in the PF were recruited from 3 different introductory psychology courses, all taught by different instructors (none of them the same as the instructor for the other conditions). Participants initially attended an individual session with one out of seven potential experimenters. During this first phase, PF participants were individually oriented to the study and given informed consent. Next, participants’ general demographic information was assessed
(see Appendix A). The OPTS was then administered in which participants were asked to report their answers out loud. This was followed by the IAT and the remaining measures which were given in counterbalanced order. The participants were subsequently excused.

Exactly one week later, participants in the PF condition attended what appeared to be a group session with three other undergraduates who were also, allegedly participating in the study. However, the three undergraduates were actually confederates, trained to respond in a rehearsed manner for the purpose of the current investigation. During the second phase of the experiment, the experimenter asked the participant and confederates to complete the OPTS in a fashion such that they took turns reading their answers out loud to each item. For example, the researcher asked participants to “Please report out loud the percentage of obese people whom you think are humorous.” Seating during the experiment was arranged such that the participant answered each question last. Confederates responded in a predetermined manner such that their responses averaged 20 points above each participant’s percentage ratings of positive traits and 20 points below each participant’s percentage estimates of negative traits on the OPTS that was completed the prior week. For example, confederate one may have reported 15 percentage points above the participant’s score, confederate two may have reported 10 percentage points above, and confederate 3 may have reported 30 percentage points above for a given estimate of a positive trait. Thus, number sets were created in which a fixed number of points were added or subtracted from each of the 20 OPTS items completed by a participant (See Appendix D). Three separate, fixed number sets were created such that each confederate reported different numbers in a given testing session (each set averaging 20 points above or below the participant’s previous answers). This was done in order to increase believability such that each confederate was reporting different estimates verbally, all based on the participant’s phase 1 ratings. It should be
noted that participants in the AF and TP conditions received feedback using the 3rd number set out of the three sets used in the PF condition. Additionally, pre-determined decision rules were created to address situations in which a participant gave an estimate during phase 1 that would result in values below 0 or above 100 if the set formula were followed. Testing packets were strategically placed such that confederates were seated in front of those containing lightly penciled in answers. The experimenter asked each person to answer a given item out loud such that confederates read their penciled in value and the participant gave their verbal estimate last. Following this exercise, the participants and confederates completed the IAT followed by the remaining two measures in counterbalanced order. Next, the experimenter announced that they would like to provide additional feedback to participants individually and excused the confederates from the room saying, “please wait outside the door and I will be having you come back in one at a time to give you each your feedback.” In reality, the true participant was always the first person to receive individual “feedback.” At this time, the participant was debriefed regarding the true nature of the study asked whether they were aware that the others were confederates. Participants who endorsed that they were aware of the manipulation were identified for future comparisons. Finally, the participant was given a measure of motivation for attitude change.

Six upperclass undergraduates were selected from a pool of over 50 applicants to be involved in the current study as experimenters/confederates. The opportunity for research experience was advertised to upperclass psychology majors and students were selected on the basis of GPA, experience, and schedules. Their height and weight was recorded in order to calculate BMI and determine if this variable might affect participants’ manner of answering in the second phase. Confederate/experimenters were trained over a series of two weeks and
procedures were piloted with two graduate students unaware of the study design in order gather feedback regarding the believability of the method and to provide confederate/experimenters with increased practice. Confederate/experimenters were given research credit as well as $80.00 for their involvement over 8 weeks of data collection.

Measures

Four dependent measures were used to assess weight bias in each of the four conditions. *Obese Persons Trait Survey (OPTS; Puhl et al., 2005).*

This questionnaire (see Appendix E) was originally constructed by Stangor et al. (2001) for the purpose of assessing racial stereotypes. However, Puhl et al. (2005) later adapted it for measuring weight bias using the same format. The OPTS asks participants to estimate the percentage (from 0% to 100%) of obese persons who possess 20 stereotypical traits, including 10 negative stereotypes (lazy, undisciplined, gluttonous, self-indulgent, unclean, lack of willpower, unattractive, unhealthy, insecure, sluggish) and 10 positive stereotypes (honest, generous, sociable, productive, organized, friendly, outgoing, intelligent, warm, humorous). Following each estimation of trait prevalence, participants are also asked to circle how confident they are in their estimates by circling a number (1 = *Not at all confident*, 9 = *Extremely confident*). Puhl et al. (2005) used a review of stigma literature (Puhl & Brownell, 2001) as well as existing measures used to assess weight bias (Allison et al., 1991; Lewis et al., 1997; Teachman & Brownell, 2001) to select 21 negative and 21 positive traits. This list was piloted on 20 undergraduate and graduate students by requesting that they select 10 negative and 10 positive traits from the larger list that they felt were “most typically applied to obese people.” The 10 most frequently chosen positive and negative traits were included in the final questionnaire. The internal reliability for the OPTS was calculated across three experiments in Puhl et al. (2005),
revealing that both the positive traits subscale ($\alpha = .83$) and negative traits subscale ($\alpha = .73$) were reliable. In the current study, the positive traits subscale ($\alpha= .83$) and negative subscale ($\alpha= .86$) were comparable to reliability found in Puhl et al. (2005). Test-retest reliability assessed among control participants was measured as $r = .78$ and $r = .92$ for positive and negative traits respectively in the current study. Finally, baseline ratings of positive and negative traits was significantly correlated, $r = -.18$, $p = .03$.

*Anti-fat Attitudes Questionnaire (AFAQ; Crandall, 1994).*

This measure (see Appendix F) was originally designed to compare anti-fat views with symbolic (covert) racism. It is a 13-item scale including three subscales: *Dislike of Fat People* (e.g., “I really don’t like fat people that much”), *Fear of Fat* (e.g., “I feel disgusted with myself when I gain weight”), and *Beliefs about the Controllability of Weight* (or “willpower;” e.g., “Some people are fat pretty much through their own fault”). Participants rate each item on a scale from 1 to 9, with higher numbers indicating greater dislike, fear, or belief in the controllability of weight. Crandall (1994) found each of the subscales to have adequate reliability: *Dislike of Fat People* ($\alpha = .84$), *Fear of Fat* ($\alpha = .79$), and *Beliefs about the Controllability of Weight* ($\alpha = .66$). In order to increase the internal consistency of the scale, Quinn and Crocker (1998) added 5 items to the dislike and controllability subscales. The reliability coefficient for the controllability subscale and dislike subscales was raised from .72 to .84 and from .81 to .89, respectively after the addition of these items. In the current study, reliability was comparable in the subscales *Dislike of Fat People* ($\alpha= .91$), *Fear of Fat* ($\alpha = .87$), and *Beliefs about Controllability of Weight* ($\alpha = .87$). The overall reliability of the AFAQ was .90. Test-retest reliability for control participants was also adequate at $r = .86$ for *Dislike of Fat People*, $r = .88$ for *Fear of Fat*, $r = .67$ for *Beliefs about the Controllability of Weight*, and $r =
.82 for the total AFAQ. This measure was given to participants as an additional measure of weight bias to the OPTS and IAT due to its ability to distinguish self-referencing anti-fat attitudes and beliefs about controllability of overweight. Thus, the AFAQ was given to provide additional information about subtle forms of explicit weight bias that are different from the OPTS (estimation about positive and negative traits held by the obese) yet still important. Finally, the AFAQ provides an explicit measure of bias that is separate from the experimental manipulation in this investigation.

*Marlowe-Crowne Social Desirability Scale* (MCSDS; Crowne & Marlow, 1960)

This is a 33-item, true-false questionnaire (see Appendix G) that assesses the extent to which individuals avoid self-criticism and portray themselves in positive terms. The scale was designed to measure behaviors that are culturally approved of but unlikely to occur. An example item is, “I never hesitate to go out of my way to help someone in trouble.” Scores on the MCSDS are correlated with other social desirability scales (e.g., Edwards Social Desirability Scale; \( r = .35 \)) and high internal consistency and test-retest reliability have also been demonstrated for this measure (Crowne & Marlowe, 1960). In the current study, internal consistency was also found to be high (\( \alpha = .80 \)). Test-retest reliability was also good, \( r = .89 \). This measure was given in order to assess whether social desirability is related to baseline measures of bias or changes in bias ratings across time.

*Motivation for Attitude Change Form*

This measure was developed for the purposes of the current investigation in order to explore whether participants were aware of any attitude change that they may exhibit after filling out the questionnaires a second time (see Appendices H through K). The form was given to all participants, however, separate versions were created for each condition. More specifically, the
open-ended format in the beginning of the form has been tailored to explore how participants experienced each manipulation (e.g. “Do you think that your judgments on the questionnaires you just completed were influenced by the feedback about how you compared with other students’ ratings of traits that you were given?”). The last portion of the form, however, was the same for all participants and required them to rate how much they agreed on a scale from 1 (disagree) to 7 (agree) with 6 statements regarding possible reasons for attitude change (i.e., You wanted to be accurate about what obese people are like; You didn’t want others to think that you were prejudiced against the obese; You didn’t want to feel like you are more negative about obese people than others are; You didn’t want others to look down on you for your views about obese people; You felt you learned what obese people are really like from the feedback; You wanted to feel more in agreement with others’ views on the obese.). Chronbach alphas were conducted to determine inter-item consistency of proposed subscales on the motivational measure. Items proposed to load on the Informational Social Influence Scale (ISIS) produced an alpha of .6 whereas those on the Normative Social Influence Scale (NSIS) produced an alpha of .9. Given the relatively low reliability of the ISIS subscale, principle components factor analysis revealed low inter-item reliability for item 1 (alpha of .3) which stated, you wanted to be accurate about what people who are obese are like. An examination of the subscales with item 1 removed revealed an alpha of .7 (items 5 and 6) for the informational social influence (ISIS) and .9 for the normative social influence (NSI; items 2, 3, and 4). Averages for each subscale were created for comparisons.

Implicit Associations Test (IAT; Greenwald et al., 1998).

The IAT (see Appendix I) has been used to study implicit attitudes related to social prejudice and has recently been applied to research on weight bias (Grover et al., 2003;
Teachman & Brownell, 2001; Teachman et al., 2003). The IAT is based on the idea that stimuli classification is facilitated and thus faster when category pairs match implicit associations. Therefore, participants are expected to categorize stimuli faster when categories are paired in such a way that matches the way concepts are already related in their minds. Processing speed is used as an indirect measure of an individual's association between two concepts (i.e., obesity and negative stereotypes). It is important to note that this method assumes that the stronger a person's implicit association, the stronger their implicit attitude. Studies using the IAT have also found evidence of implicit anti-fat bias across multiple populations (Grover et al., 2003; Teachman & Brownell, 2001; Teachman et al., 2003).

Initially, participants were instructed to classify words into more general categories. Insects and flowers are used as stimuli during the practice portion of the IAT. For example, *daisies, tulips, bugs, and mosquitoes* will be classified into the categories, *flowers* or *insects*. At the same time, participants classified these words as either *good* or *bad*. In one condition, the categories, *good* and *flowers* versus *bad* and *insects* were paired whereas in the second condition, the categories, *good* and *insects* versus *bad* and *flowers* were paired. Previous research has found (Greenwald et al., 1998; Teachman et al., 2003) that participants are faster at generalizing stimuli when the paired categories matched their implicit associations than when the categories were mismatched. Next, in order to assess implicit, anti-fat bias, participants were asked to classify stimuli while associating fat and thin people with positive and negative traits. Again, it was expected that stimuli would be paired more easily when the category pairings were consistent with negative associations towards the obese.

Consistent with methodology used in Teachman et al. (2003), participants were asked to associate the target categories, *fat people* and *thin people* with the attribute categories, *good* and
They were also asked to associate the same target categories with the attribute categories, smart and stupid. Finally, they were asked to associate the targets with the attribute categories, motivated and lazy. The order of these tasks was counterbalanced across participants. On one page, the target and the attribute categories were paired on either side of a column in a way expected to match negative implicit associations with overweight (e.g., fat people with bad on the top of one side of the column and thin people with good at the top of the other side of the column). On the other page, however, the target and attribute categories were paired to contradict potentially negative associations with overweight (e.g., fat people will be paired with good on one side and thin people will be paired with bad on the other side). The order of pages requiring expected versus unexpected pairings were also counterbalanced to control for order effects.

Participants were given 20 seconds to classify as many words as they possibly could on each page of the IAT (6 pages total). The dependent variable was the difference in the number of correctly classified items under the two different category pairings.

Participants were asked to work as quickly as they could and to try to avoid making mistakes but to continue without stopping, even if they did make a mistake. They were also told to not skip any items. The three words for each target and attribute category were consistent with those used in Teachman et al. (2003).

The practice IAT consisted of the attribute categories, Insects (target words: bugs, mosquito, roach), Flowers (target words: daffodil, daisy, tulip) Good (target words: wonderful, joyful, excellent) and Bad (target words: terrible, nasty, and horrible). For the weight bias IAT tasks, the attribute categories were Fat People (target words: fat, obese, large), Thin People (target words: slim, thin, skinny), Bad (same target words as above), Good (same target words as above), Smart (target words: intelligent, smart, bright), Stupid (target words: dumb, stupid,
dense), Motivated (target words: determined, motivated, eager) and Lazy (target words: slow, lazy sluggish). See reliability section of results for internal consistency and test-retest reliability of the IAT.
CHAPTER IV. RESULTS

Demographic and Baseline Differences

158 participants completed baseline measures (see Table 1 for baseline and demographic characteristics). Twenty-four participants did not return to complete the second phase of the experiment and three participants in the public feedback (PF) condition were excluded from the analyses after reporting that they were aware of the experimental manipulation. The final sample included 131 participants. The control group and AF each included 35 participants, the TP included 30 participants, and the PF included 31 participants. Bonferroni corrections were applied to all analyses containing multiple comparisons (both planned and post-hoc) to reduce the chance of type I error. Additionally, all hypothesized analyses were examined using one-tailed tests of significance while post-hoc analyses used two-tailed tests.

Chi-square analyses and ANOVAs revealed that no demographic factors were associated with condition. However, due to the planned recruiting strategy, condition was significantly associated with class that the participant was recruited from, $\chi^2 (6, 155) = 155.6, p < .0001$ (Bonferroni corrected $p$ value of .008). Participants in the anonymous feedback (AF), trait prevalence feedback (TP), and control condition were recruited from a developmental psychology course and an introductory psychology course taught by the same instructor, whereas participants for the public feedback (PF) condition were recruited from three different introductory courses taught by three different instructors. Because of the recruitment strategy, there was a significant relationship between year in school and condition in that were significantly more freshman in the PF condition than in the other three conditions, $\chi^2 (9, 155) = 34.7, p < .0001$ (Bonferroni corrected $p$ value of .008). Therefore, year in school and class recruited from were controlled for in comparisons between conditions in the following analyses.
Independent sample t-tests and Chi-Square analyses were used to examine differences in demographic variables between Phase 2 completers and non-completers. Year in school was significantly related to whether participants completed phase 2 in that more juniors did not complete phase 2 than other years, \( \chi^2 (3, 155) = 13.4, p < .01 \) (Bonferroni correct \( p \) value of .01). However, there were no other demographic differences between completers and non-completers (i.e., gender, age, ethnicity, BMI, or course participants were recruited from). Additionally, there were no significant differences between number of completers and non-completers on baseline measures of bias, social desirability or in the four conditions.

Independent sample t-tests, one way ANOVAs, and Pearson correlations were used to examine potential relationships between demographic variables and baseline measures of bias and social desirability. There were no significant relationships between demographic variables and baseline measures of bias or social desirability. Finally, there were no differences between the four conditions on all baseline measures of bias and social desirability.

Analyses were conducted in order to determine whether participants felt more socially pressured to deny bias based on the weight status of the experimenter. One way ANOVA revealed no significant differences between the 6 different experimenters on bias within the PF condition during both phases. Additionally, there were no significant differences between the 10 different combinations of confederate members present during a phase 2 feedback sessions on measures of bias within the PF condition.

**Relationships between Baseline Measures of Bias**

Pearson correlations were conducted in order to examine the relationship between baseline measures of bias including the social desirability, Good/Bad IAT difference score, Motivated/Lazy IAT difference score, both negative and positive trait estimates on the OPTS, the
three subscales of the AFAQ (Fear of Fat, Dislike of Fat People, and Beliefs About the Controllability of Overweight; see Table 3). There was a significant, negative correlation between estimates of positive traits and Dislike of Fat People, \( p = .001 \) and between ratings on the social desirability and Dislike of Fat People, \( p = .002 \). There was a positive correlation between negative trait ratings and Beliefs about Controllability of Weigh, \( p < .0001 \) and between estimates of negative trait estimates and Dislike of Fat People, \( p < .0001 \). A Bonferroni corrected \( p \) value of .002 was used for all of the latter comparisons.

Reliability and Distribution of Variables

Prior to analysis of reliability, the IAT data was checked to confirm that each page of IAT data included at least 5 completed items. Additionally, IAT pages with \( \geq 35\% \) incorrectly classified items were omitted due to potential distraction or misunderstanding. These procedures for data omission are consistent with techniques utilized by Teachman et. al (2003). Four participants’ complete IAT measures and two participants’ Bad/Good IAT pairing were deleted for the reasons mentioned above.

Preliminary analyses revealed variables that were skewed or significant for kurtosis. Confidence in trait estimations on the OPTS (both positive and negative), estimates of negative traits on the OPTS, items on the Motivation Form, and items on the Fear of Fat subscale were all significant for negative skew. Therefore, each case was subtracted from a constant number (the mean for each variable) and a subsequent square root transformation was performed. This created normally distributed scores for the estimates of negative traits and confidence estimations. However, the 6 items on the Motivational Form and the Fear of Fat scale remained significant for negative skew and thus the original variable values were kept in the following analyses.
A log transformation was also performed for significant positive kurtosis on the Motivational Form items, Bad/Good and Motivated/Lazy difference scores on the IAT, Dislike subscale of the AFAQ. While this transformation corrected kurtosis in the IAT difference scores and items on the Dislike subscale, items on the Motivational Form remained significant for positive kurtosis. Transformed data will be used for subsequent analyses within this investigation with the exception of negative trait estimations on the OPTS given that performing the transformation on this variable creates a non-normal distribution in estimation of positive traits.

Internal consistency was found to be highly reliable for all scales, resulting in no calculated Chronbach alphas below .70 (see Table 1). Test-retest analyses using the control group for the basis of analysis found all variables to be highly reliable across time (See Table 1) with the exception of IAT difference score measures \((r = .30\) for Motivated/Lazy; \(r = .57\) for Bad/Good). Therefore, a transformation was performed to increase reliability of IAT outcome scores based on a method used by Teachman et al., (2003). Both IAT difference scores were inserted into an algorithm: \(\text{max/min-1} \times \sqrt{\text{max-min}}\) where maximum (max) and minimum (min) respectively represent category pairings where the highest vs. lowest number of items were correctly classified. However, this transformation did not increase test-retest reliability in the control group \((r = .24\) for Motivated/Lazy; \(r = .43\) for Bad/Good).

**OPTS and AFAQ Ratings**

It was hypothesized that all experimental conditions would evidence larger decreases in bias over time than the control group, that the PF would reduce bias further than the AF TP, and that the TP would reduce bias further than the AF would. AFAQ scores were predicted to decrease and to be significantly related to changes on the OPTS over time but not with changes on the IAT.
Initially, paired t-tests were used to examine change in measures of bias over time within each condition (See Table 2). Results revealed a significant increase on the dislike scale within the control group \( t(34) = -3.3, p = .002 \), a significant increase in positive trait ratings within the AF \( t(33) = -4.3, p < .0001 \), a significant decrease in negative trait ratings within the AF \( t(33) = 4.3, p < .0001 \), a significant increase in positive trait ratings within the TP \( t(29) = -6.6, p < .0001 \) and a significant decrease in negative trait ratings in the TP \( t(29) = 4.8, p < .0001 \). Within the PF, ratings of positive traits increased while ratings of negative traits decreased significantly over time, \( t(30) = -12.7, p < .0001 \) and \( t(30) = 18.1, p < .0001 \) respectively. A Bonferroni corrected \( p \) value of .004 was used for all of the latter comparisons.

Difference scores were created for both positive and negative trait estimates at phase 1 versus phase 2 among all participants. A reverse score was created for the difference in positive trait estimates over time in order to obtain an absolute value when comparing this to negative trait estimate changes over time. Repeated measures found no main effect for change in positive traits over time compared to negative traits across conditions. Thus, positive and negative trait estimates changed similarly over time.

The difference in change between positive and negative trait ratings was also examined within each condition. Results revealed a significant difference only in the PF condition, in which negative trait ratings became less negative than positive trait ratings became more positive over time, \( t(30) = -4.5, p < .0001 \), Bonferroni corrected \( p \) value of .01.

Two 4 (experimental condition) by 2 (phase of measurement) ANOVAs with repeated measures were computed to assess change over time between the four conditions for both positive and negative trait ratings (See Figures 1 and 2). A significant interaction was detected between experimental condition and positive trait ratings, \( F(3, 123) = 8.7, p < .0001 \) as well as a
significant interaction between experimental condition and negative trait ratings. \( F(3, 122) = 14.6, p < .0001. \)

Twelve planned comparisons were conducted to examine whether differences within the interaction supported initial hypotheses (See Table 5). A difference score measuring change from phase 1 to phase 2 was computed and 12 separate, univariate analyses compared change between the four conditions for both positive and negative trait estimates while controlling for year in school and class recruited from (Bonferroni corrected \( p \) value of .008). There were no significant differences between the AF and PF, AF and TP, and the TP and the PF in increase of positive trait ratings from phase 1 to phase 2. However, the TP and PF increased positive trait ratings higher than the control group did, \( F(3, 58) = 6.8, p = .001 \) and \( F(3, 59) = 11, p < .0001 \), respectively. There was a trend towards a difference between the control group and the AF, \( F(3, 62) = 2.6, p = .06. \)

For negative traits, planned comparisons revealed no significant difference in change from phase 1 to phase 2 between the AF and TP conditions. The PF and TP conditions decreased negative trait ratings significantly more than the control group did \( F(3, 58) = 24.2, p < .0001 \) and \( F(3, 57) = 3.7, p = .01 \) respectively (one-tailed test met Bonferroni correction). Finally, there was a trend towards a significant difference between the AF and the control group in reducing negative trait ratings, \( F(3, 57) = 3.4, p = .02. \) Additionally, the PF condition significantly decreased negative trait ratings from phase 1 to phase 2 compared to the AF, \( F(3,61) = 6.2, p = .001 \) and TP conditions, \( F(3, 57) = 7.2, p < .0001. \)

Repeated measures revealed no main effect over time for AFAQ ratings. There was a significant increase in dislike scale ratings within the control group, \( t(34) = 3.3. \) However, there was a significant interaction in change on the dislike scale over time between the four conditions,
\[ F(3, 126) = 3.3, \ p = .02 \] (See Figure 4). Six post-hoc comparisons were used to interpret this interaction (Bonferroni corrected \( p \) value of .008 for these comparisons; See Table 5). A difference score measuring change from phase one to phase 2 was computed and 6 separate, independent sample t-tests compared change on the dislike scale between the four conditions. Results revealed a significant difference in change over time between the control group and TP on dislike, \( t(63) = -2.8, \ p = .007 \); the control group increased in bias while the TP decreased in bias.

Change in bias ratings over time as measured by the OPTS and AFAQ were compared using Pearson correlations revealing a significant, positive relationship between negative trait ratings and AFAQ ratings over time, \( r = .26, \ p = .003 \). In other words, decreases in bias on the AFAQ were positively related to decreases in bias on negative trait estimates on the OPTS over time.

A post-hoc analysis of the relationship between gender and change in bias over time was also conducted, revealing a significant interaction between gender and AFAQ scores, \( F(129) = 3.8, \ p < .05 \). Specifically, men increased more than women decreased on their responses for the total AFAQ scale. There were no other significant interactions between other measures of bias or social desirability and gender.

**Confidence Ratings**

A negative relationship was hypothesized to occur between confidence ratings and changes in bias over time. Pearson correlations revealed no significant relationship between baseline or phase 2 confidence ratings and changes in levels of bias over time as measured by participants’ estimates of positive and negative traits on the OPTS across all conditions. However, Pearson correlations revealed that among participants in the anonymous feedback
condition, larger decreases in negative trait ratings were associated with lower levels of confidence at baseline, \( r = .67, p = .01 \) (Bonferroni corrected \( p \) value of .01).

**Surprise Ratings**

Univariate analysis controlling for year in school and class revealed participants’ ratings of how surprised they were by written feedback in the control group, AF, and TP were not significantly different between conditions on both positive and negative trait subscales of the OPTS. However, Pearson correlations revealed that participants’ ratings of how surprised they were by written feedback regarding their positive trait estimates were significantly related to both their phase 2 estimates of positive traits, \( r = -.56, p < .0001 \), and the amount of change from phase 1 to phase 2 in positive traits, \( r = -.46, p < .0001 \) (a Bonferroni corrected \( p \) value of .01 was used for the latter comparisons). Thus, the higher participants’ phase 2 positive trait ratings were, the less surprised they were by the feedback they received. Also, the more positive participants became over time on their positive trait estimates, the less surprised they were by written feedback. However, surprise ratings were not related to phase 2 estimates of negative traits or change in negative trait estimates over time.

**Implicit Weight Bias**

It was hypothesized that participants would evidence implicit bias at baseline and that this bias would decrease within the TP and PF conditions over time. Paired t-tests revealed significant differences between motivated/fat, lazy/thin versus motivated/thin, lazy/fat pairings as well as good/thin, bad/fat and good/fat, bad/thin during both phase 1 (\( t(147) = 21.6, p < .0001; t(145) = 20.0, p < .0001 \) respectively) and phase 2 (\( t(123) = 19.3, p < .0001; t(121) = 13.7, p < .0001 \) respectively) such that participants were quicker to pair a negative word (ie., bad or lazy) with the word, fat than they were when the negative word was paired thin. While this indicates
bias on both types of pairings, independent t-tests indicated no significant differences between good/bad IAT pairings and motivated/lazy in levels of displayed bias.

A difference score was created between total correct responses on the IAT task in which the target word, good was paired with fat and bad was paired with thin versus the IAT in which good was paired with thin and bad was paired with fat. A difference score was also created for the motivated/fat, lazy/thin versus motivated/thin, lazy/fat IAT pairings. In other words, the higher the difference scores, the higher the weight bias. Paired t-tests were used to examine changes on these difference scores over time within each condition (See Table 2). There were no significant changes over time on either the motivated/lazy or good/bad IATs within any of the conditions.

Two 4 (experimental condition) by 2 (phase of measurement) ANOVAs with repeated measures were computed to assess change over time for both the motivated/lazy IAT and good/bad IAT pairings. There was a significant main effect over time indicating that the discrepancy between the good/fat pairings decreased over time (see Figure 3), $F(1, 102) = 7.9$, $p=.006$. However, there was no change in discrepancy for the motivated/lazy pairings over time. Finally, there were also no significant interactions in change in the discrepancy between the motivated/lazy or good/bad pairings over time between the four conditions.

**Relationship between Implicit and Explicit Measures**

With regards to comparing implicit and explicit weight bias, it was hypothesized that implicit bias would not be related to explicit bias and that implicit bias would be more resistant to change than explicit bias. Pearson correlations were used to examine the relationship between implicit and explicit bias. There was no significant relationship between baseline measures of positive or negative trait ratings and baseline motivated/lazy or good/bad IAT. Additionally,
there were no significant relationships between the baseline AFAQ (or any of its subscales) and baseline motivated/lazy or good/bad IAT scores. There was a significant, positive correlation between phase two motivated/lazy scores and phase two negative trait ratings, \( r = .21, p = .03 \). Likewise, there was a significant, positive relationship between phase two AFAQ ratings and phase two motivated/lazy scores, \( r = .21, p = .02 \) and a positive relationship between phase two willpower subscale and phase two motivated/lazy scores, \( r = .2, p = .03 \). There was a significant correlation between changes in negative trait ratings over time and changes in motivated/lazy scores over time, \( r = .24, p = .01 \) in that decreases in negative trait ratings over time were correlated with decreases in difference scores on the motivated/lazy IAT over time. Finally, changes on estimates of negative traits and motivated/lazy scores were positively related in the PF condition \( r = .46, p = .02 \). However, a Bonferroni corrected \( p \) value of .002 was used for the latter comparisons, making them all non-significant after adjusting for type I error rate. There were no significant relationship between changes in the AFAQ or any of its subscales over time and changes in IAT motivated/lazy or good/bad scores over time. A comparison between changes on the AFAQ and its subscales and IAT differences scores was also examined within the TP and PF conditions and no significant differences were detected.

Percent of change on the IAT and the OPTS over time was calculated in order to compare explicit vs. implicit biases. In the total sample, there was a 12.9% decrease in participants’ estimates of negative traits, 12.5% increase on positive trait estimates, 17.7% decrease in bias on the Motivated/Lazy IAT, and a 0.8% decrease in bias on the Good/Bad IAT. Paired t-tests revealed no significant difference between implicit and explicit measures on percent change in the total sample.
In the control group, there was a 1.5% decrease in estimates of negative traits, 2.9% decrease in positive traits, 53.9% decrease on the Motivated/Lazy IAT, and 14.7% decrease on the Good/Bad IAT. In the AF condition, there was a 14.8% decrease in estimates of negative traits, 4.3% increase in positive traits, 4.1% decrease on the Motivated/Lazy IAT and a 9.5% decrease on the Good/Bad IAT: 9.5%. In the TP condition, there was an 12.8% decrease in estimates of negative traits, 17.9% increase on positive traits, 19.5% increase on the Motivated/Lazy IAT, 6.1% decrease on the Good/Bad IAT. In the PF condition, there was a 24.3% decrease in estimates of negative traits, 16.4% increase in positive traits, 4.3% decrease on the Motivated/Lazy IAT, and 4.6% decrease on the Good/Bad IAT.

Paired t-tests were compared within each condition to examine differences between implicit and explicit measures (Bonferroni correction applied at $p > .01$). A significant difference was detected within the PF condition between negative OPTS ratings and the Motivated/Lazy IAT, $t(26) = -4.1$. The negative OPTS changed significantly more than the Mot/Lazy IAT.

*Marlowe Crowne Social Desirability Scale*

It was hypothesized that within the PF condition, baseline measures of social desirability would be positively related to changes in bias over time. Repeated measures revealed no main effect or interaction for social desirability ratings over time. Pearson correlations revealed that baseline social desirability was not related to change in positive or negative OPTS ratings over time. Social desirability was not associated with changes in OPTS or AFAQ ratings within the PF condition specifically. Finally, baseline social desirability was not related to changes in implicit biases over time.

*Motivational Measure*
It was hypothesized that participants would score higher on the informational social influence scale (ISIS) in the trait prevalence feedback condition (TP) than in the other conditions. Scores on the ISIS were also predicted to be higher in the anonymous feedback condition (AF) than in the control group or public feedback (PF). Finally, it was predicted that ratings on the normative social influence scale (NSIS) would be higher in the PF than in any of the other conditions. Paired t-test revealed a significantly higher endorsement on NSIS than ISIS within the whole sample, \( t(128) = -2.7, p = .008 \). There was no significant difference between ratings on the NSIS and ISIS in the control condition, AF, or TP. However, there was a significantly higher endorsement on the NSIS than ISIS as the motivation behind estimate changes in the PF condition, \( t(29) = -3.4, p = .002 \). A Bonferroni corrected \( p \) of .01 was used for the prior analyses.

Univariate analysis controlling for year in school and class revealed significant differences between the four conditions on both the normative social influence (NSIS) and informational social influence (ISIS), \( F(3, 125) = 4.3, p = .006 \) and \( F(3, 125) = 5.6, p = .001 \) respectively. One tailed tests were utilized for the following analyses. Six planned comparisons were conducted for both the NSIS and ISIS in the form of independent t-tests in order to determine the differences between the conditions (a Bonferroni corrected \( p \) of .008 was used). The AF was significantly higher than the control group on the ISIS \( t(68) = -2.3, p = .02 \) but this result did not reach significance despite a one-tailed test due to the Bonferroni correction. The TP was also significantly higher on the ISIS than the control group, \( t(63) = -2.6, p = .01 \). Participants in the PF endorsed significantly higher NSIS and ISIS than participants in the control group, \( t(63) = -3.6, p = .001 \) and \( t(62) = -4.1, p < .0001 \), respectively. Participants in the PF also scored significantly higher on the NSIS than did participants in the AF, \( t(63) = -3.1, p = \)
.003 or the in the TP, \( t(58) = -2.2, p = .03 \). However, the latter result did not reach significance due to the Bonferroni correction. Chi Square analyses revealed a significant difference between conditions on whether participants endorsed that they felt their opinions were influenced by experimental manipulation. Post-hoc Chi Square analyses revealed that significantly more participants in the TP and PF thought they were influenced by experimental manipulation than did those in the control group, \( \chi^2 (1, 63) = 7.7, p = .006 \) and \( \chi^2 (1, 63) = 15.8, p < .0001 \) respectively. Additionally, significantly more participants in the PF believed they were influenced by feedback than did those in the AF, \( \chi^2 (1, 65) = 9.3, p = .002 \). A Bonferroni corrected \( p \) value of .008 was used for the prior analyses.

**Open Ended Question on Motivational Form**

Participants were first asked to report whether they thought their beliefs were influenced by the experimental manipulation during the second phase of the study (yes/no format). Subsequently, they responded to the open-ended question, “If YES, why do you think your judgments changed the second time you answered the questionnaires? If NO, why do you think your judgments did not change the second time you answered the questionnaires?”

An exploratory coding system was designed which maximized content comparison across the open ended question. Participants’ responses to the question were examined for overall content themes. Second, general categories were derived based on these responses (See Appendix J). The rationale behind the formation of these particular categories was to look at participants’ responses and then summarize common themes within and across the question as to why they believed that their responses were/were not influenced by the manipulation. An analysis of reported themes revealed 19 expressed themes as rationales for their answer of “yes” or “no” as to whether they believed their answers were influenced by experimental manipulation.
(See Table 4). These themes were categorized as normative influence (6 different themes), informational social influence (3 themes), or other (10 themes). In regards to the overall sample, 33.6% endorsed having been influenced by experimental manipulation whereas 66.4% denied this. Twenty-six percent of the sample endorsed categories that were considered normative social influence (NSI) as a rationale for changes in their estimates during the second phase (e.g., answers such as “I often change my thoughts based on others), 10% endorsed categories that were considered informational social influence (ISIS; e.g., answers such as “Lots of other people’s opinions must be more accurate than mine alone”) and 64% endorsed rationales that were considered to be other (e.g, “My own weight status kept my answers consistent”). No participants in the control group endorsed NSI or ISIS for rationales for their answers (all fell in the other category). Participants in both the anonymous feedback condition (AF) and trait prevalence feedback condition (TP) endorsed equal amounts of NSI (16.7%), ISIS (16.7%), and other rationales (66.6%) whereas more participants in the public feedback condition (PF) reported NSI as a rationale (65.3%) than ISIS (7.7%) or other reasons (27.0%). Participants’ most frequent rationale for denying experimental influence was the category, “I am opinionated/steadfast/confident in my own beliefs” (27.1%). Chi-square analysis revealed a significant difference between conditions on endorsement of rationales for manner of answering on the Motivational Form, $\chi^2 (6, 96) = 37.2, p < .0001$ (See Table 4). More participants in the PF endorsed NSI than participants in the other three conditions.
CHAPTER V. DISCUSSION

Purpose of Study

The current investigation was designed to examine changes in both explicit and implicit bias in response to three experimentally manipulated feedback conditions, public feedback, anonymous feedback, and trait prevalence feedback (PF, AF, and TP) and a control condition. Another goal of the study was to replicate Puhl et al.’s (2005) findings regarding trait prevalence and anonymous social consensus feedback. Finally, this study aimed to explore participants’ awareness and understanding of why their answers did or did not change (i.e., the type of social influence if any) in the four conditions.

It was hypothesized that participants who received public feedback would report less explicit and implicit bias over time than those in the control group or those given hypothetical information in the TP or AF conditions. I also hypothesized that providing trait prevalence information (TP) would be more influential in decreasing bias than hypothetical social consensus condition (AF) and that all experimental conditions would evidence more decreases in bias than the control group over time. Motivation for these changes were predicted to be driven by higher endorsement of a desire to be correct (ISIS) in the TP than in all other conditions, higher ISIS in the AF than PF, and higher desire to be liked/accepted (NSIS) in the PF than in all other conditions. In regards to implicit biases, it was predicted that while IAT difference scores would change significantly in the PF and TP conditions, they would be more resistant to change over time than explicit measures. Finally, it was predicted that social desirability would be positively related to change in weight bias over time in the PF condition only and that lower reports of confidence in trait estimates would be negatively correlated with higher changes in bias over time.
Explicit Bias

Overall, evidence provided by the current investigation supports the prediction that the PF condition would be more influential in changing bias than the other three conditions. Indeed, PF condition evidenced significantly greater change over time than TP, AF, and the control group in either positive or negative traits, if not both. Based on these analyses, it is quite plausible that participants in the PF condition felt more compelled to modify explicitly reported beliefs than any of the other conditions.

Participants in the PF condition were particularly influenced in their estimates of negative traits in the obese population. Participants in the PF condition became notably less negative over time than they became more positive. This is an interesting finding given that in previous studies of social consensus, positive views increased more than negative views decreased (Puhl et al., 2005; Stangor et al., 2001). One interpretation of this finding is that participants may have found it harder to publically endorse negative traits than to refrain from endorsing positive beliefs whereas participants in other studies who were not required to report their views in a non-anonymous setting did not feel social pressure to report decreased negative biases.

The findings from this investigation are consistent with previous experiments that have utilized confederates in a laboratory setting to produce significant changes in participants’ reported opinions (Asch, 1952). When participants in this study were questioned as to what might be motivating these changes, participants in the PF condition endorsed normative social influence (NSI) as their most frequent rationale. In fact, participants in this condition endorsed NSI more than in any other condition. Additionally, NSI was judged to be a stronger factor than informational social influence (ISI) within the PF condition, although informational social influence was endorsed as a driving factor as well. When giving rationales for changes in bias,
participants in the PF condition often endorsed that they were unsure of their original estimates, and hearing other students’ opinions provided them with increased perceived accuracy. Nonetheless, these students were more strongly influenced by a desire to fit in with group opinions and not be judged as biased or rejection for being too negative about others. In fact, the most frequently endorsed response that reflected normative social influence was the category, “I often change my thoughts based on others’ opinions.” One student wrote, “I believe that the opinions of others can easily sway my opinions.” Examination of the motivation for change appears to support Puhl et al. (2005) speculation that combining both normative and informational social influence would produce larger changes in bias than either type of social influence alone. PF condition participants clearly reported both normative and informational social influences. By hearing live reports from other students and giving their own reports live, participants may have experienced a greater drive to appear within socially normal limits. Due to the manipulation, participants’ reports were less biased than they reported alone with the experimenter during the first phase of the study. At the same time, they also appeared to believe that information about others’ views could be sources of truth or reality, especially when there seemed to be a consensus in a given (more positive) direction. In addition, while Puhl et al. (2005) reasoned that normative social influence was the primary driving factor behind their anonymous social consensus condition, the results from this investigation suggest that the PF condition used in this study appeared to exert a stronger form of normative social influence than the AF condition given the former’s non-anonymous methodology.

The AF condition, a replication of Puhl’s (2005) social consensus condition, did not produce significant change in bias over time beyond the control group. Despite this, participants in the AF did become significantly less negative and more positive on trait estimates when
assessed at phase 2, whereas participants in the control group became slightly more negative over time (on the dislike scale of the AFAQ). While these differences were detected, it is noteworthy that the AF condition was hypothesized to be a relatively weak manipulation of biases in the current investigation. Indeed, while not significantly different, participants both in the TP condition (this latter result was non-significant) and PF condition reported more normative social influence than those in the AF condition. As hypothesized, this is believed to be due to the fact that the AF condition was a weak source of normative social influence given the non-anonymous structure of the condition. It was also hypothesized that the AF condition would influence participants through primarily informational social influence. Participants in the AF condition did not appear to be significantly swayed to agree with others’ opinions out of a desire to align their reported beliefs with others for social acceptance or accuracy. Thus, neither informational nor normative social influence was more prominent in the AF condition. Again, this is believed to be due to the fact that participants had little social cost to risk in an anonymous setting and were receiving less information about purported facts (i.e., the true prevalence of traits in the obese population).

Only participants in the AF condition supported the hypothesis that confidence in baseline OPTS ratings would be negatively correlated with increased change in bias over time. Lower confidence in AF participants created a tendency to alter their biases in order to be in agreement with a purported majority whereas those with high confidence levels were less likely to change over time. While it is not entirely clear why participants in the AF exhibited this tendency, Asch (1952) documented that participants who lacked confidence in their own judgments of line lengths were more likely to report consistently with the majority rather than the correct answer. One interpretation of this finding may be that the relatively weak
manipulation in the AF may have allowed the influence of confidence levels on trait ratings to emerge. Participants in the conditions with stronger manipulations may not have been as affected by their own confidence levels if they were relying on information regarding how others view people who are obese to guide their ratings.

The TP condition was influential in reducing bias as reported on the OPTS in comparison to the control group. However, while the TP condition produced slightly more change than the AF condition did on the OPTS, in contrast to Puhl et al. (2005), this difference did not reach significance. Additionally, as hypothesized, the TP reported a significantly higher amount of informational social influence as the motivation behind changes in bias. This pattern of results suggests the TP condition to be somewhat more influential than the AF condition.

An examination of the larger pattern of results on the OPTS reflects the order in which the different conditions were hypothesized to be influential in decreasing explicit bias. This order was PF, TP, AF, and control group from most influential to least. Very large effect sizes were detected for repeated measures between conditions of both negative and positive OPTS scores, .43 and .46 ($\eta^2$). A conservative $p$ value was calculated using the Bonferroni correction for the 12 post-hoc comparisons between conditions on the OPTS (.008), indicating that these were robust findings. Based on these analyses, it is quite clear that participants in the PF condition felt more compelled to modify their explicitly reported beliefs.

In regards to reported motivations for changes in bias, results from the OPTS combined with reported rationales for attitude change seemed to indicate that normative and informational social influence did not operate exclusively in any of the conditions. This finding is consistent with patterns described by Deutsch and Gerard (1955). While a primary influence was present in some, participants believed they were influenced in both normative and informational social
influence. Thus, within the social consensus framework, these two types of influence appear to coincide more often than they operate independently, though one may be more prominent than the other.

The AFAQ was less influenced by experimental manipulation than trait estimates on the OPTS, even though these two measures were positively correlated. The AFAQ was included in the current investigation as a measurement of weight bias independent of the experimental manipulation (whereas the OPTS was not). Interestingly, participants within the control group, PF condition, and AF condition all increased in dislike of people who are obese over time even though only the control group evidenced a significant increase. While results measured by the OPTS appear promising in regards to attitude change, the relative lack of change on the AFAQ raises the question of generalizeability of the current manipulation. The effectiveness of the current intervention depends upon the ability of non-anonymous social consensus information to change bias consistently across multiple measures of explicit bias, implicit bias, and behavior. While results from the OPTS did not generalize to the AFAQ in the current study, it will be important to determine if other measures of explicit bias are effected by strong manipulations of normative social influence in order to determine if this is a representative result.

Interestingly, men seemed to increase in bias over time on the AFAQ while women decreased, producing a significant interaction. While this was not a hypothesized difference, it is consistent with literature which documents that men show greater negativity towards overweight targets (Brochu & Morrison, 2007). While men and women were no different in levels of bias at baseline, it could be that men's tendency to evidence more weight bias was revealed when they were exposed to information regarding obese people over time.
While it is clear that participants in the PF may have experienced much less social pressure to mask potential anti-fat biases on a measure that was again, anonymous, it is surprising that all conditions with the exception of the TP condition increased in dislike on the AFAQ. Perhaps increased exposure to stimuli suggestive of negative biases towards people who are obese actually increased dislike which was more likely to explicitly expressed when assessment was anonymous (in all conditions). This would especially be the case in the control group in which no intervention was conducted to counteract this effect, explaining why an increase in dislike was only significant in this condition. Previous studies have found consistently the ease with which negative biases can be increased (Lewis et al., 1997; Puhl et al., 2005; Teachman et al., 2003; Weiner et al., 1988) and others have confirmed that viewing stimuli related to stigmatized out groups can increase negative bias (Dovidio et al, 1997). The TP was the only condition that changed AFAQ scores in a positive direction, perhaps indicating that influences that contain factual information (i.e., percent of people who are obese that possess particular traits) are helpful in reducing more emotional forms of bias as expressed on the Dislike scale. However, it is important to note that TP participants did not significantly decrease in dislike over time.

A weak relationship between OPTS scales and MCSDS indicates that different methods of assessing explicit bias may be more susceptible to the effects of social desirability. In this study, it is possible that this is because the AFAQ makes stronger explicitly negative statements (e.g., blatant dislike or disgust of obese people) that it is more susceptible to the influence of socially desirable, relative to the OPTS’s more benign trait estimates.

Scores on the MCSDS were not related to changes in bias within the PF condition or any other condition. It was hypothesized that participants in the PF condition would be more
influenced by social desirability given the high social cost involved in the manipulation. These results are consistent with a lack of relationship between change scores in trait ratings and social desirability from previous research (Puhl et al., 2005) and suggest that social desirability does not change in response to exposure to normative social influence.

Motivational Questionnaire and Participant Rationales

An interesting difference in participant rationales can be seen when looking at patterns of endorsement on the open-ended version of the form versus the closed-item portion. In the free response portion, participants gave rationales that indicated equal percentages of informational and normative social influence in both the TP and AF conditions, although there was much less normative and informational social influence in the AF condition overall. Spontaneously generated responses may be considered a valuable source of information on participants’ rationale for being influenced by the experimental manipulation. On the other hand, participants may not have been aware of reasons behind their changes until they were recognized on the close-ended portion of the form. Either way, the discrepancy is notable. While it is clear on both portions that the PF condition was higher than any other condition in normative social influence, the distinction between the AF and TP conditions remains somewhat ambiguous. It is important to acknowledge that most participants reported no influence. In fact, 59% of the experimental sample reported that they were not influenced at all by any experimental manipulation. Given that explicit biases in the total sample decreased significantly across time, many participants were not aware of their own changes in reported attitudes. It is unclear how accurate participants are in identifying their own rationales. A study by Hepburn and Locksley (1983) found a negative correlation between participants' objective scores on a measure of stereotyping of different groups (e.g., race or weight status) and their subjective scores of how much they felt
they were influenced by the manipulation of bias included in the study. The authors of this study concluded that a lack of introspective awareness in regards participants’ own biases was the source of these results. It is plausible that participants in the current study were not aware of any changes in bias that may have occurred after experiencing a manipulation in the experimental conditions of this study. It is also not clear whether participants were aware of their baseline level of bias but results from Hepburn and Locksely (1983) would suggest that participants have difficulty in judging either one.

*Implicit Bias*

As predicted, participants in the current sample evidenced significant implicit bias in all conditions. This was true for both the Good/Bad and Motivated/Lazy target pairings. Thus, at baseline, participants had more difficulty pairing negative words to the concept of thin they did the concept of fat and also had more difficulty assigning positive words to the concept of fat in comparison to the concept of thin. These findings differ from the study by Teachman et al. (2003) who did not find bias on the Good/Bad IAT comparison but did for Motivated/Lazy targets, indicating a potentially more pervasive and global form of anti-fat bias in the current sample. While a main effect was detected for decreases in Good/Bad IAT discrepancy over time, change in the PF and TP conditions specifically was not detected. Cohen’s $d$ was calculated as a medium effect (.6 for comparisons in both conditions), indicating that insufficient power may have reduced the ability to detect group differences in implicit bias. Despite this, the hypothesis that the IAT would decrease, but be more resistant to change than explicit measures was supported. As suspected, it is quite possible that changes at an automatic implicit level may be resistant even to powerful manipulations such as the PF condition in the current investigation. Although implicit biases have been altered in other studies, Crandall (1994) asserted that anti-fat
bias is particularly strong and resistant to change. A study by Carels et al. (in press) found that behaviors in weight loss participants associated with implicit bias (e.g., energy expenditure) were more resistant to change than those associated with explicit bias. Teachman et al. (2003) was not able to produce implicit changes in their total sample but found that participants who were obese evidenced less implicit bias after experimental treatment aimed at increasing empathy for overweight individuals. Indeed, when overweight and obese participants were selected post hoc for analysis in the current investigation, a decrease in implicit bias due to manipulation was detected. Data from the current study is thus consistent with findings from Teachman et al. (2003) when selecting participants with a BMI greater or equal to 25 kg/m². Bad/Good IAT difference scores significantly decreased in the overweight and obese population in the current study, $t(34) = 2.8, p = .008$. However, participants in the current study with BMI levels below 25 kg/m² did not decrease in implicit bias over time. This is a particularly interesting finding given that previous research has consistently indicated equal levels of anti-fat bias in the overweight/obese population as the average population (Crandall, 1994).

Together, the results of implicit bias testing is consistent with previous findings but lends further support to the idea that even interventions powerful at changing explicit beliefs may not be addressing automatic responses and negative implicit attitudes towards people who are obese. The question remains how important this is in regards to real-life behavioral displays of bias. Bessenoff and Sherman (2000) found implicit measures to be associated with behavioral displays of bias, suggesting that interventions might need to be aimed at preventing biases from being initially formed given the difficulty in changing them once ingrained. Other studies have documented the association between implicit bias and automatic behavior as well as difficulty in decreasing implicit bias (Teachman et al., 2003; Wilson & Schooner, 2000).
Relationship Between Explicit and Implicit Bias

The hypothesis that there would be no relationship between explicit and implicit measures was supported in regards to baseline and phase two measures. However, there was a significant relationship between change over time in negative trait estimates and on the Motivated/Lazy IAT. A substantial amount of previous research has found inconsistent associations between implicit and explicit weight bias (Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Greenwald & Banaji, 1995; Teachman et al., 2003). Teachman et al. (2003) did find moderate correlations between implicit and explicit biases, particularly when assessing participant’s ratings of obese people as lazy using the IAT and Fat Phobia Scale (FPS; Robinson, Bacon, & O’Reilly, 1993). This finding is consistent with the current study given that negative trait ratings on the OPTS targets laziness as a potential area for anti-fat bias. It may be more socially acceptable to endorse “lazy” as pertaining to the obese population given widely endorsed controllability beliefs. Labeling an obese person as “bad” may be viewed as more global and less justified.

An examination of patterns in percent change on the different measures revealed no significant differences in implicit and explicit measures with the exception of those within the PF condition. Negative traits on the OPTS evidenced more change than did the Motivated/Lazy IAT scores, supporting the hypothesis that explicit bias would be more sensitive to manipulations than implicit beliefs would be. This effect seems to be evident when manipulations are particularly influential (such as in the PF condition). It is possible that participants felt increased social pressure to explicitly report changed beliefs while reporting less change in bias on implicit measures that are separate from public scrutiny.

Conclusions
Clearly the most evident finding in the current investigation is the relative strength of the public feedback manipulation in which participants were asked to report opinions about people who are obese out loud, in front of a group of confederate students. An analysis of rationales for perceived changes in bias revealed that both normative social influence and informational social influence operated together in changing most people’s estimates. Results from the other conditions revealed that providing factual information was somewhat more effective in changing biases than social consensus information in an anonymous setting. The other conditions appeared to both utilize both informational and normative social influence, but to a lesser degree than in the public feedback condition. Findings also suggest that different types of explicit measures of bias may produce discrepant results. In the current study, it appears as though the AFAQ was more affected by social desirability. As suspected, a high amount of anti-fat bias was detected on the IAT and overall, a reduction on the Good/Bad IAT was seen in the total sample. However, bias on the IAT was so pervasive that no reduction in implicit bias was achieved in the public feedback condition. This may be due to the automatic, unconscious nature of the measure such that participants may not even be aware of their own anti-bias. Or, participants may have only altered responses on explicit measures for social reasons while maintaining anti-fat beliefs. While the total sample decreased in implicit beliefs over time, it is not clear which manipulations most contributed to this change. Indeed, it appears as though some of this change, if not all, is driven by the obese population in the current sample, supporting Teachman et al. (2003) and their findings that interventions may be able to affect beliefs in the population biases affect the most. The modest relationship between explicit and implicit beliefs detected in this study also suggests that there may be some manner with which to affect implicit beliefs through explicit manipulations. In summary, an encouraging message from the current investigation is that
explicit and implicit change can occur as a result of strong normative and informational social influence combined. However, we do not know how long it lasts and how it pertains to real life behavior.

**Strengths and Limitations**

One of the largest strengths of the current study is the inclusion of a non-anonymous condition in which participants are asked to voice their opinions publicly. A study of previous literature (Asch, 1952) indicates that this kind of manipulation may be a purer measure of normative social influence than asking participants to complete measures anonymously (i.e., on paper-pencil tests). The current study also assessed participants’ own perceptions regarding why they may have answered differently after a manipulation, a component that had not been studied in previous investigations. While it came from a subjective source, this information allowed for further understanding of which kinds of social influences were believed to be occurring in response to experimental manipulation. Another strength of the current study was the inclusion of both explicit and implicit measures of weight bias. While previous studies have included both types of assessments, it has not been examined with regards to the manipulation of social consensus information. The size of the sample in this investigation and within subjects component allowed for adequate power to detect existing differences and reduced the rate of type II error. At the same time, effect sizes were found to be high for many of the findings and conservative corrections were used, limiting the potential for type I error.

The current investigation also possessed limitations which create the need for tentative conclusions regarding some of the findings. The inclusion of the PF condition presented practical difficulties with regards to data collection that were not ideal methodologically. Namely, the PF group was recruited from a different class sample and was signed up for
individual experiments through the internet rather whereas the AF, TP, and control conditions were conducted in a common group setting. Thus, parallel methods were not employed. However, an examination of baseline differences allowed for some control of influence that these differences may have produced over target analyses between conditions. Likewise surprise ratings were not collected within the PF condition regarding information participants may have learned about other participants’ views on the OPTS. This information would have allowed for interesting comparison about whether live, non-anonymously expressed opinions were more or less surprising than anonymous, written information. Of course, the current investigation included a largely homogenous population with regards to ethnicity, age, and socio-economic status, which may limit generalizability to larger groups of people. A replication in a more diverse population may reveal differences in how sensitive groups are to social influences regarding weight bias. Another useful comparison would have been achieved by including normal weight trait estimates on the OPTS. Including this comparison would have allowed for more direct assessment of weight bias, whereas the current investigation relies upon differences pre and post manipulation to indicate changes in bias. Another limitation pertains to conclusions drawn from open-ended questions on the motivational measure. Given that the rating system used was not established based on previous research and a second rater was not used to determine reliability of the coding of these responses, results should be viewed tentatively. Finally, the current study used Bonferroni corrections for many groups of comparisons in order to control for family-wise error rates. While this decreased the chances of type I error, it also decreased power.

Future Research
While evidence for the existence of weight bias was detected in the current investigation, the measures utilized have not yet been found to be correlated with behavioral displays of this bias. Thus, application of the current findings to the every-day experience of discrimination and bias that obese people may experience is an important focus for future research. Bessenoff and Sherman (2000) found that “controlled” or explicit measures of bias were largely unrelated to observed behavioral indications of bias (chosen seating distance from an obese individual) whereas implicit or “automatic” measures were positively related to these behavioral indicators. It is worth noting, however, that Bessenoff and Sherman (2000) concluded that the kind of behavioral bias they observed in their study (spontaneously chosen seating distance from an obese individual) was somewhat unconscious in nature, itself. They proposed that a more purposeful and deliberate behavioral indicator of bias should be used in comparison to explicitly reported bias in order to determine if a stronger relationship exists. Such a study would provide important information about how both explicit and implicitly expressed biases contribute to behavioral displays of bias towards the overweight population. This type of investigation could help researchers to determine whether implicit or explicit measures are better indicators of purposeful, intentional forms of bias versus less deliberate, automatic displays of bias. While both implicit and explicit weight bias was detected in the current investigation, it is not yet clear what implications these findings have in natural settings. Similarly, the current study was conducted in such a manner that assessment of phase 2 attitudes occurred immediately after the manipulation. Future research might be conducted longitudinally in order to determine the length of time such a manipulation affects attitudes. This is especially important given the frequency with which anti-fat biases are conveyed to the general public through different types of social influence (e.g., the media). A recent study by Zitek and Held (2007) assessed participants one
month after manipulating weight bias using social consensus information and found that changes were maintained over this length of time. Again, it will be important to determine which interventions can create these lasting effects and how long they can be maintained. Additionally, given that implicit biases were shown to be more influenced within the overweight and obese population in the current study as well as in previous research (Teachman, et al., 2003), it will be important to research bias reduction further in this population specifically. This is especially so given the social repercussions of biases on people who are obese and observed internalization of anti-fat biases.

**Implications**

Given that implicit biases are so resistant to change and social consensus information is powerful in altering explicit beliefs, focus on the prevention of the formation of anti-fat biases may be especially important for future generations. As mentioned previously, messages portrayed in the media and in domestic social settings all contribute to the internalization of stigmatization (Puhl & Brownell, 2001; Puhl & Heuer, 2009). Children from a very young age exhibit preferences for thin over fat and it will be important to alter the formation of this early in life. This study also points to the necessity for presenting both informational and normative social influence in as many public settings as possible in order to alter anti-fat bias in the general population. Finally, the results from the current investigation also suggest that people may not be aware of their own biases and potentially, how these biases may affect their behavior. This result points to the importance of educating the public about the existence of these biases to begin with and the repercussions these have on those who are targeted.

**Summary**
The current investigation sought to examine change in both explicit and implicit anti-fat biases as a function of different types of social influences. Results indicated that to a larger extent, the expression of explicit beliefs changes with regards to a non-anonymous, normative social influence, when people perceive that others’ views are inconsistent with their own. Expressions of explicit beliefs (which may differ from truly held beliefs) are also subject to change when factual information in contrast to negative biases is presented. Both normative and informational social influence appear to be strongest when combined in reducing negative, explicit bias towards people who are obese. Implicit anti-fat biases were very prominent in the current sample and more resistant to change than expression of explicit beliefs. Finally, a small association between implicit and explicit beliefs suggests that it is possible that implicitly held beliefs may be altered by strong explicit manipulation. However, future research should focus on determining how this pertains to naturalistic behavior and the length of time such manipulations endure.

Given the widespread nature of anti-fat bias and the harmful physical and psychological effects this has on the lives of people who are obese, determining methods of changing these attitudes have large implications. Results from the current investigation are encouraging as they indicate that strong, public manipulations of social feedback are effective at producing attitude change in the positive direction. The next steps will be applying these findings to naturalistic environments, measuring the length of their effect, and exploring how they relate to behavioral displays of bias in order to increase the quality of life and reduce suffering for a large portion of the population.
REFERENCES


APPENDIX A.

Demographic Questionnaire

Name (First, Last) ________________________

Gender (check one): Male_____ Female_____  

Height (Feet, Inches) ____feet ____inches

Approximate Weight: _____Lbs.

Age: _____years

Year in school (check one): Freshman ____ Sophomore____  Junior ____  Senior ____

Ethnicity (check one): Caucasian___  
Asian American/ Pacific Islander___  
African American___  
Hispanic____  
American Indian_____  
Multi-racial/ Bi-racial_____  
Other_____
APPENDIX B.

Sample of Favorable Feedback in the Anonymous Feedback condition. Sample scores were computed based on a hypothetical participant’s answers of 50% for each trait.

Extensive testing at Bowling Green State University has revealed that the beliefs that STUDENTS have about OBESE PEOPLE. For each of the following traits, STUDENTS believe that the indicated percentage OBESE PEOPLE possess this particular trait. We are interested in YOUR reaction to this information. Therefore, for each of the traits, please CIRCLE A NUMBER to indicate how surprised you are by that percentage. There are no right or wrong answers.

1. Percent who believe that obese people are HUMOROUS: 72%
   How surprised are you by the above information?

   Not at all    1 2 3 4 5 6 7 8 9   Extremely Surprised
   Surprised   

2. Percent who believe obese people are LAZY: 31%
   How surprised are you by the above information?

   Not at all    1 2 3 4 5 6 7 8 9   Extremely Surprised
   Surprised   

3. Percent who believe obese people are SELF-INDULGENT: 28%
   How surprised are you by the above information?

   Not at all    1 2 3 4 5 6 7 8 9   Extremely Surprised
   Surprised   

4. Percent who believe obese people are GENEROUS: 71%
   How surprised are you by the above information?

   Not at all    1 2 3 4 5 6 7 8 9   Extremely Surprised
   Surprised   

5. Percent who believe obese people are SOCIABLE: 71%
   How surprised are you by the above information?

   Not at all    Extremely
   Surprised   
Surprised 1 2 3 4 5 6 7 8 9 Surprised

6. Percent who believe obese people are UNDISCIPLINED: 28%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Surprised

7. Percent who believe obese people are FRIENDLY: 69%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Surprised

8. Percent who believe obese people are GLUTTONOUS: 29%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Surprised

9. Percent who believe obese people are OUTGOING: 70%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Surprised

10. Percent who believe obese people are INTELLIGENT: 68%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Surprised

11. Percent who believe obese people are UNHEALTHY: 31%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Surprised
12. Percent who believe obese people are HONEST: 70%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

13. Percent who believe obese people are SLUGGISH: 28%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

14. Percent who believe obese people are PRODUCTIVE: 71%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

15. Percent who believe obese people have LACK OF WILLPOWER: 29%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

16. Percent who believe obese people are UNCLEAN: 32%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

17. Percent who believe obese people are WARM: 72%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised
18. Percent who believe obese people are INSECURE: 28%

How surprised are you by the above information?

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19. Percent who believe obese people are ORGANIZED: 69%

How surprised are you by the above information?

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20. Percent who believe obese people are UNATTRACTIVE: 30%

How surprised are you by the above information?

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APPENDIX C.

Sample of manipulation feedback information concerning supposed true prevalence of traits among obese people if participants’ responses were 50% for each of the traits on the original trait questionnaire.

Extensive scientific research using testing at Bowling Green State University has revealed that for each of the following TRAITS, the identical percentage of OBESE INDIVIDUALS possesses this particular trait in the general population. We are interested in YOUR reaction to this information. Therefore, for each of the TRAITS, please CIRCLE A NUMBER to indicate how surprised you are by that percentage. There are no right or wrong answers. Please give your best estimate.

1. Percent who believe that obese people are HUMOROUS: 72%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

2. Percent who believe obese people are LAZY: 31%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

3. Percent who believe obese people are SELF-INDULGENT: 28%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

4. Percent who believe obese people are GENEROUS: 71%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

5. Percent who believe obese people are SOCIABLE: 71%

How surprised are you by the above information?
6. Percent who believe obese people are UNDISCIPLINED: 28%

How surprised are you by the above information?

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7. Percent who believe obese people are FRIENDLY: 69%

How surprised are you by the above information?

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8. Percent who believe obese people are GLUTTONOUS: 29%

How surprised are you by the above information?

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9. Percent who believe obese people are OUTGOING: 70%

How surprised are you by the above information?

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10. Percent who believe obese people are INTELLIGENT: 68%

How surprised are you by the above information?

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11. Percent who believe obese people are UNHEALTHY: 31%

How surprised are you by the above information?

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</table>
12. Percent who believe obese people are HONEST: 70%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

13. Percent who believe obese people are SLUGGISH: 28%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

14. Percent who believe obese people are PRODUCTIVE: 71%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

15. Percent who believe obese people have LACK OF WILLPOWER: 29%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

16. Percent who believe obese people are UNCLEAN: 32%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised

17. Percent who believe obese people are WARM: 72%

How surprised are you by the above information?

Not at all Surprised 1 2 3 4 5 6 7 8 9 Extremely Surprised
18. Percent who believe obese people are INSECURE: 28%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

19. Percent who believe obese people are ORGANIZED: 69%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised

20. Percent who believe obese people are UNATTRACTIVE: 30%

How surprised are you by the above information?

Not at all 1 2 3 4 5 6 7 8 9 Extremely Surprised
APPENDIX D.

PF, AF, and TP Condition Decision Rules

Confederate 1
OPTS item and amount to be added or subtracted

1. 10
2. 30
3. 15
4. 25
5. 10
6. 30
7. 15
8. 25
9. 25
10. 15
11. 10
12. 30
13. 20
14. 10
15. 20
16. 30
17. 15
18. 25
19. 20
20. 20

Confederate 2
OPTS item and amount to be added or subtracted

1. 17
2. 23
3. 14
4. 26
5. 20
6. 13
7. 27
8. 20
9. 15
10. 25
11. 21
12. 19
13. 12
14. 28
Confederate 3 (This set was used to create feedback for the AF and TP conditions)
OPTS item and amount to be added or subtracted

1. 15
2. 15
3. 25
4. 25
5. 20
6. 20
7. 30
8. 10
9. 10
10. 30
11. 20
12. 15
13. 25
14. 20
15. 25
16. 15
17. 30
18. 10
19. 10
20. 30

Decision Rules

If the addition for positive traits put the number over 100, continue subtracting 5 from the amount you were planning on adding until you are under 100.

If the subtracting of a certain amount for negative traits puts the number under 0, continue adding 5 to the amount you were planning on subtracting until you are over 0.
APPENDIX E.

Obese Persons Trait Survey (OPTS)

For each of the following traits, estimate the percentage (any number between 0 and 100) of Obese People whom you think possess this particular trait. Afterward, please indicate how confident you are in your estimate by circling a number. There are no right or wrong answers. Please give your best estimate.

1. **Humorous:** _________% of obese people possessing this trait
   My confidence in the above estimate:

   Not at all  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | Extremely Confident
   Confident  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

2. **Lazy:** _________% of obese people possessing this trait
   My confidence in the above estimate:

   Not at all  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | Extremely Confident
   Confident  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

3. **Self-indulgent:** _________% of obese people possessing this trait
   My confidence in the above estimate:

   Not at all  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | Extremely Confident
   Confident  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

4. **Generous:** _________% of obese people possessing this trait
   My confidence in the above estimate:

   Not at all  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | Extremely Confident
   Confident  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

5. **Sociable:** _________% of obese people possessing this trait
   My confidence in the above estimate:

   Not at all  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | Extremely Confident
   Confident  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

6. **Undisciplined:** _________% of obese people possessing this trait
   My confidence in the above estimate:

   Not at all  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | Extremely Confident
   Confident  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
7. **Friendly**: __________ % of obese people possessing this trait  
   My confidence in the above estimate:

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8. **Gluttonous**: __________ % of obese people possessing this trait  
   My confidence in the above estimate:

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9. **Outgoing**: __________ % of obese people possessing this trait  
   My confidence in the above estimate:

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10. **Intelligent**: __________ % of obese people possessing this trait  
    My confidence in the above estimate:

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11. **Unhealthy**: __________ % of obese people possessing this trait  
    My confidence in the above estimate:

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12. **Honest**: __________ % of obese people possessing this trait  
    My confidence in the above estimate:

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13. **Sluggish**: __________ % of obese people possessing this trait  
    My confidence in the above estimate:

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14. **Productive:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
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<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>

15. **Lack of Willpower:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>

16. **Unclean:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>

17. **Warm:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>

18. **Insecure:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>

19. **Organized:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>

20. **Unattractive:** ________% of obese people possessing this trait  
My confidence in the above estimate:  
<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Confident</th>
</tr>
</thead>
</table>
APPENDIX F.

Anti-Fat Questionnaire (AFAQ)

Please circle the number that most closely reflects your feelings about each statement below.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  2  3  4  5  6  7  8  9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I really don’t like fat people much.

   Strongly Disagree 1  2  3  4  5  6  7  8  9 Strongly Agree

2. I don’t have many friends that are fat.

   Strongly Disagree 1  2  3  4  5  6  7  8  9 Strongly Agree

3. I tend to think that people who are overweight are a little untrustworthy.

   Strongly Disagree 1  2  3  4  5  6  7  8  9 Strongly Agree

4. Although some fat people are surely smart, in general, I think they tend not to be quite as bright as normal weight people.

   Strongly Disagree 1  2  3  4  5  6  7  8  9 Strongly Agree

5. I have a hard time taking fat people too seriously.

   Strongly Disagree 1  2  3  4  5  6  7  8  9 Strongly Agree

6. Fat people make me feel somewhat uncomfortable.

   Strongly Disagree 1  2  3  4  5  6  7  8  9 Strongly Agree
7. If I were an employer looking to hire, I might avoid hiring a fat person.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. I feel repulsed when I see a fat person.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. Fat people disgust me.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. I have an immediate negative reaction when I meet a fat person.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. I feel disgusted with myself when I gain weight.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. One of the worst things that could happen to me would be if I gained 25 pounds.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. I worry about becoming fat.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. People who weigh too much could lose at least some part of their weight through a little exercise.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. Some people are fat because they have no willpower.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Fat people tend to be fat pretty much through their own fault.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Fat people can lose weight if they really want to.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18. Through a combination of exercise and dieting, anyone can lose weight and keep it off indefinitely.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. The medical problems that overweight people have are their own fault.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. Overweight people are responsible for their own problems.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

21. Weight is something that is under a person’s control.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G.

Marlowe-Crowne Social Desirability Scale (MCSDS)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true (T) or false (F) as it pertains to you personally.

T F 1. Before voting I thoroughly investigate the qualifications of all the candidates. (Answer even if you don’t vote)

T F 2. I never hesitate to go out of my way to help someone in trouble.

T F 3. It is sometimes hard for me to go on with my work if I am not encouraged.

T F 4. I have never intensely disliked anyone.

T F 5. On occasion I have had doubts about my ability to succeed in life.

T F 6. I sometimes feel resentful when I don’t get my way.

T F 7. I am always careful about my manner of dress.

T F 8. My table manners at home are as good as when I eat out in a restaurant.

T F 9. If I could get into a movie without paying and be sure I was not seen, I would probably do it.

T F 10. On a few occasions, I have given up doing something because I thought too little of my ability.

T F 11. I like to gossip at times.

T F 12. There have been times when I felt like rebelling against people in authority even though I knew they were right.

T F 13. No matter who I’m talking to, I’m always a good listener.

T F 14. I can remember “playing sick” to get out of something.

T F 15. There have been occasions when I took advantage of something.

T F 16. I’m always wiling to admit when I make a mistake.
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>F</td>
<td>17. I always try to practice what I preach.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>18. I don’t find it particularly difficult to get along with loud mouthed, obnoxious people.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>19. I sometimes try to get even, rather than forgive and forget.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>20. When I don’t know something, I don’t at all mind admitting it.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>21. I am always courteous, even to people who are disagreeable.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>22. At times I have really insisted on having things my own way.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>23. There have been occasions when I felt like smashing things.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>24. I would never think of letting someone else be punished for my wrongdoing.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>25. I never resent being asked to return a favor.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>26. I have never been irked when people expressed ideas very different from my own.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>27. I never make a long trip without checking the safety of my car. (Answer even if you don’t have a car)</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>28. There have been times when I was quite jealous of the good fortune of others.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>29. I have almost never felt the urge to tell someone off.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>30. I am sometimes irritated by people who ask favors of me.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>31. I have never felt that I was punished without cause.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>32. I sometimes think when people have misfortunes they only got what they deserved.</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>33. I have never deliberately said something that hurt someone’s feelings.</td>
</tr>
</tbody>
</table>
APPENDIX H.

Motivation for Attitude Change Form-PF Version

Do you think that your answers on the questionnaires you just completed were influenced by giving your answers to one of the questionnaires out loud in front of other students?

Please circle one: Yes No

If YES, why do you think your judgments changed the second time you answered the questionnaires? If NO, why do you think your judgments did not change the second time you answered the questionnaires?

Think about what it was like to fill out the questionnaires a second time after giving answers to one of the questionnaires out loud. Please circle the number that corresponds with how much you agree with the following statements about what may have influenced your ratings the second time you filled out the questionnaires.

1. You wanted to be accurate about what people who are obese are like.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

2. You didn’t want others to think that you were prejudiced against people who are obese.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

3. You didn’t want to feel like you are more negative about people who are obese than others are.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
4. You didn’t want others to look down on you for your views about people who are obese.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

5. You felt like you learned what people who are obese are like in reality from the feedback.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

6. You wanted to feel more in agreement with others’ views on people who are obese.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
APPENDIX I.

Instructions and forms for the Implicit Association Test (IAT)

“I am going to ask you to participate in a brief task that involves classifying words related to insects and flowers. Then I’ll run you through the tasks that demonstrate particular beliefs toward specific groups of people.”

Slide 1.

<table>
<thead>
<tr>
<th>WORD CATEGORIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flowers</strong></td>
</tr>
<tr>
<td><strong>Bad</strong></td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

“We are interested in how people categorize words. For this task, when I say go, you will have 20 seconds to classify as many of the items you can running down the page into the categories they belong to at the top of the page. For the first page, you will notice that there are 2 categories on each side. For every item that is a flower (daffodil, daisy, or tulip) or a word that means “bad” (nasty, terrible, or horrible) you will put a check in the left circle. In contrast, for every item that is an insect (bug, mosquito, or roach) or a word that means “good” (excellent, joyful, or wonderful) you will put a check in the right circle. Remember that there are 4 categories so you are not deciding if you think flowers and insects are good or bad, you are just putting flowers into the flower group, insects into the insect group, words that mean good in the good group, and words that mean bad in the bad group. As you can see here, wonderful goes in the good group, and Roach, goes in the Insect group, which are both on the right column. Nasty goes in the bad group and Daisy goes in the Flower group, which are both in the left column. The words are in random order, so you will need to look at each one and then check the appropriate column.”

“Any questions?”

Slide 2.
GUIDELINES
Go Fast
Try not to make mistakes
Don’t correct errors
Don’t skip any items
Quick check through circle

1. Page one of Insects and Flowers

“So when I say go classify the items as fast as you can. Try not to make mistakes though-if you do make a mistake, don’t stop to correct an error, just keep going. It is important not to skip any items-you have to go in order and just make a quick check through the circle (don’t waste time carefully filling it in). I will give you twenty seconds to complete as many items as you can and I’ll let you know when to start and stop. Begin at the top of the list and work your way down; if you finish the first column begin the second column. Very few people complete the first column though-this is meant to be difficult so please don’t feel frustrated! Any questions?”
“Please go.” Conduct task for 20 seconds. “Please turn the page”

Slide 3.

<table>
<thead>
<tr>
<th>Insects Bad</th>
<th>CATEGORY SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>Wonderful</td>
</tr>
<tr>
<td>Ø</td>
<td>Roach</td>
</tr>
<tr>
<td>Ø</td>
<td>Nasty</td>
</tr>
<tr>
<td>O</td>
<td>Daisy</td>
</tr>
<tr>
<td>O</td>
<td>Joyful</td>
</tr>
<tr>
<td>O</td>
<td>Tulip</td>
</tr>
<tr>
<td>O</td>
<td>Terrible</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flowers Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
<tr>
<td>O</td>
</tr>
</tbody>
</table>

2. Second page of Insects and Flowers (categories switched)

“Now the instructions are the same except 2 of the categories have switched sides. Notice that now insects and bad words go to the left side and flower and good words go to the right. So here,
wonderful goes in the good column on the right, and roach goes on the insect column on the left. Nasty goes in the Bad column on the left and Daisy goes in the flower column on the right. Please follow the same instructions as on the previous page-go as fast as you can and make as few mistakes as possible. Any questions?”

“Please go.” *Conduct task for 20 seconds.*

3. First page of first Fat/Thin task-counterbalanced order means this could be Bad/Good, Motivated/Lazy or Smart/Stupid.

“Now that you understand how this task works, I would like to run you through the same procedures but have you complete the task that looks at word associations with different groups of individuals. The instructions are the same as we did with the flower/insect task, but now we have new categories so take a minute to get used to what words go where by looking at the top of your page. For each page, remind yourself of which items belong to which categories by looking at the top. Any questions?

Please turn the page. Take a moment to get used to the classification of these words. The instructions are the same and I will let you know when to start”

“Please go.” *Conduct task for 20 seconds.*

4. Second page of first Fat/Thin task (categories switched)

“Thank you. Now flip the page and you’ll see that you now have the categories switched around. Again, take a moment to get used to the new classification before the timing starts.

“Please go.” *Conduct task for 20 seconds*

5. First page of second Fat/Thin task

Please turn the page. Notice that there are new category words at the top of the page. Take a moment to get used to the classification of these words. The instructions are the same and I will let you know when to start”

“Please go.” *Conduct task for 20 seconds*

6. Second page of second Fat/Thin task (categories switched)

“Thank you. Now flip the page and you’ll see that you now have the categories switched around. Again, take a moment to get used to the new classification before the timing starts.

“Please go.” *Conduct task for 20 seconds*

7. First page of third Fat/Thin task
Please turn the page. Notice that there are new category words at the top of the page. Take a moment to get used to the classification of these words. The instructions are the same and I will let you know when to start

“Please go.” Conduct task for 20 seconds

8. Second page of third Fat/Thin task (categories switched)

“Thank you. Now flip the page and you’ll see that you now have the categories switched around. Again, take a moment to get used to the new classification before the timing starts.

“Please go.” Conduct task for 20 seconds
APPENDIX J.

Coding Template for Motivational Measure Open-Ended Question

**Normative Social Influence**
1. I often change my thoughts based on others
2. I didn’t want to stick out as different/want to be normal
3. I didn’t want to seem judgmental/rude/biased/prejudiced
4. I didn’t feel comfortable sharing my real opinion in front of others/ I felt bad about my own biases
5. After seeing how others felt, I felt o.k. to report my true opinions
6. The obese person in the experimental group changed my response

**Informational Social Influence**
7. I wanted my answer to be valid for research purposes/wanted to be accurate
8. Lots of other people’s opinion must be more accurate than mine alone
9. I was swayed by others because I wasn’t sure of my beliefs to begin with

**Other**
10. It’s how I feel/my mood changed
11. Had more time to really think about it by the second assessment point
12. My own weight status kept my answers consistent (obese-I know what it is like, not obese-I don’t know)/ tried to answer out of personal experience both times.
13. I am opinionated/steadfast/confident in my own beliefs
14. I already thought my beliefs were positive
15. I didn’t really think about it/didn’t pay attention
16. Used 50% for all answers because I didn’t know and wanted to be fair
17. I wanted to be consistent with my previous estimate
18. The manipulation wasn’t strongest enough to change my beliefs/ The numbers seemed too high to be believable
19. I received no feedback
Table 1. *Demographics and Baseline Characteristics of Sample (N = 158)*

<table>
<thead>
<tr>
<th>Baseline Measures</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, Women</td>
<td>99</td>
<td>(63%)</td>
</tr>
<tr>
<td>Race, Caucasian</td>
<td>134</td>
<td>(85%)</td>
</tr>
<tr>
<td>Freshman</td>
<td>73</td>
<td>(46%)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>38</td>
<td>(24%)</td>
</tr>
<tr>
<td>Junior</td>
<td>30</td>
<td>(19%)</td>
</tr>
<tr>
<td>Senior</td>
<td>17</td>
<td>(11%)</td>
</tr>
<tr>
<td>Introductory Psychology</td>
<td>100</td>
<td>(63%)</td>
</tr>
<tr>
<td>Developmental</td>
<td>58</td>
<td>(37%)</td>
</tr>
<tr>
<td>Public Feedback Condition</td>
<td>37</td>
<td>(23%)</td>
</tr>
<tr>
<td>Anonymous Feedback Condition</td>
<td>39</td>
<td>(25%)</td>
</tr>
<tr>
<td>Trait Prevalence Condition</td>
<td>39</td>
<td>(25%)</td>
</tr>
<tr>
<td>Control Group</td>
<td>43</td>
<td>(27%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>25.0 (5.1)</td>
</tr>
<tr>
<td>Age</td>
<td>19.9 (3.8)</td>
</tr>
</tbody>
</table>

*M (SD) = Mean (Standard Deviation)*
*N (%) = Number (Percentage)*
## Pre-Post Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline M (SD)</th>
<th>Range</th>
<th>Post-Treatment M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTS Positive Ratings</strong></td>
<td>57.7 (10.8)</td>
<td>27-83</td>
<td>64.5 (12.2)</td>
<td>35-87</td>
</tr>
<tr>
<td><strong>OPTS Negative Ratings</strong></td>
<td>60.0 (15.1)</td>
<td>12-100</td>
<td>52.2 (17.0)</td>
<td>7-84</td>
</tr>
<tr>
<td><strong>OPTS Positive Confidence</strong></td>
<td>5.4 (1.3)</td>
<td>1-8</td>
<td>5.5 (1.2)</td>
<td>2-8</td>
</tr>
<tr>
<td><strong>OPTS Negative Confidence</strong></td>
<td>5.7 (1.4)</td>
<td>1-8</td>
<td>5.5 (1.3)</td>
<td>2-8</td>
</tr>
<tr>
<td>Anti-Fat Attitudes</td>
<td>4.0 (1.3)</td>
<td>1-8</td>
<td>4.1 (1.2)</td>
<td>2-7</td>
</tr>
<tr>
<td><strong>Fear</strong></td>
<td>5.8 (2.4)</td>
<td>1-9</td>
<td>5.8 (2.4)</td>
<td>1-9</td>
</tr>
<tr>
<td><strong>Dislike</strong></td>
<td>2.7 (1.3)</td>
<td>1-8</td>
<td>2.9 (1.4)</td>
<td>1-7</td>
</tr>
<tr>
<td><strong>Willpower</strong></td>
<td>5.2 (1.5)</td>
<td>1-9</td>
<td>5.0 (1.6)</td>
<td>1-8</td>
</tr>
<tr>
<td>Social Desirability</td>
<td>14.7 (5.5)</td>
<td>1-27</td>
<td>14.6 (6.2)</td>
<td>1-32</td>
</tr>
<tr>
<td>IAT Good/Bad</td>
<td>10.4 (6.3)</td>
<td>-13-24</td>
<td>9.0 (7.1)</td>
<td>-11-26</td>
</tr>
<tr>
<td>IAT Motivated/Lazy</td>
<td>9.3 (5.2)</td>
<td>-7-22</td>
<td>9.7 (5.6)</td>
<td>-3-27</td>
</tr>
</tbody>
</table>

### Reliability

<table>
<thead>
<tr>
<th>Measure</th>
<th>Alpha</th>
<th>Test-Retest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTS Positive Trait Ratings</strong></td>
<td>.81</td>
<td>.78</td>
</tr>
<tr>
<td><strong>OPTS Negative Trait Ratings</strong></td>
<td>.86</td>
<td>.92</td>
</tr>
<tr>
<td><strong>OPTS Positive Confidence</strong></td>
<td>.92</td>
<td>.74</td>
</tr>
<tr>
<td><strong>OPTS Negative Confidence</strong></td>
<td>.91</td>
<td>.75</td>
</tr>
<tr>
<td><strong>OPTS Positive Surprise</strong></td>
<td>.81</td>
<td>__</td>
</tr>
<tr>
<td>Measure</td>
<td>Alpha&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Test-Retest&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>OPTS Negative Surprise</td>
<td>.72</td>
<td>__</td>
</tr>
<tr>
<td>Anti Fat Attitudes</td>
<td>__</td>
<td>____</td>
</tr>
<tr>
<td>Alpha</td>
<td>.90</td>
<td>.82</td>
</tr>
<tr>
<td>Test-Retest</td>
<td>.90</td>
<td>.82</td>
</tr>
<tr>
<td>Fear</td>
<td>.87</td>
<td>.88</td>
</tr>
<tr>
<td>Dislike</td>
<td>.91</td>
<td>.86</td>
</tr>
<tr>
<td>Willpower</td>
<td>.87</td>
<td>.67</td>
</tr>
<tr>
<td>Social Desirability</td>
<td>.80</td>
<td>.89</td>
</tr>
<tr>
<td>IAT Good/Bad&lt;sup&gt;3&lt;/sup&gt;</td>
<td>__</td>
<td>.57</td>
</tr>
<tr>
<td>IAT Motivated/Lazy&lt;sup&gt;3&lt;/sup&gt;</td>
<td>__</td>
<td>.30</td>
</tr>
<tr>
<td>IAT 3&lt;sup&gt;6&lt;/sup&gt;</td>
<td>.94</td>
<td>__</td>
</tr>
<tr>
<td>IAT 4</td>
<td>.88</td>
<td>__</td>
</tr>
<tr>
<td>IAT 5</td>
<td>.93</td>
<td>__</td>
</tr>
<tr>
<td>IAT 6</td>
<td>.88</td>
<td>__</td>
</tr>
<tr>
<td>Motivational Scale</td>
<td>.75</td>
<td>__</td>
</tr>
</tbody>
</table>

<sup>M (SD) = Mean (Standard Deviation)</sup>
<sup>N (%) = Number (Percentage)</sup>
<sup>1</sup> Pre-post measures and averages include only untransformed data from phase 2 completers and those who were not aware of the experimental manipulation. All figures are item averages with the exception of IAT difference scores.
<sup>2</sup> Obese Persons Trait Survey: 10 items asking participants to rate percentage of obese persons who possess positive traits or negative traits.
<sup>3</sup> Implicit Associations Test: discrepancy between correctly categorized stimuli on bad/thin, good/fat vs. bad/fat vs. good/thin pairings.
<sup>4</sup> Reliability coefficients reflect baseline measures with the exception of the OPTS surprise ratings and Motivational Scale.
<sup>5</sup> Pearson correlation coefficients were computed using the control group to determine test-retest reliability.
Table 2. Means and Standard Deviations of Weight Bias Constructs and Significant Change Over Time for All Conditions (N= 131)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Phase 1</th>
<th>Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PF</td>
<td>TP</td>
</tr>
<tr>
<td>OPTS- Positive(^2,4)</td>
<td>61.7 (7.7)(^a)</td>
<td>56.5 (12.0)(^a)</td>
</tr>
<tr>
<td>OPTS- Negative(^2,4)</td>
<td>57.8 (11.8)(^a)</td>
<td>62.5 (13.1)(^a)</td>
</tr>
<tr>
<td>OPTS Confidence-Positive</td>
<td>5.6 (1.3)</td>
<td>5.2 (1.3)</td>
</tr>
<tr>
<td>OPTS Confidence-Negative</td>
<td>5.7 (1.4)</td>
<td>5.5 (1.5)</td>
</tr>
<tr>
<td>OPTS Surprise-Positive</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>OPTS Surprise-Negative</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>AFAQ</td>
<td>3.9 (1.0)</td>
<td>4.0 (1.3)</td>
</tr>
<tr>
<td>Dislike(^4)</td>
<td>2.5 (1.3)</td>
<td>2.7 (1.7)</td>
</tr>
<tr>
<td>Willpower</td>
<td>5.0 (1.4)</td>
<td>5.1 (1.5)</td>
</tr>
<tr>
<td>Fear of Fat</td>
<td>5.8 (2.3)</td>
<td>5.4 (2.3)</td>
</tr>
<tr>
<td>MCSDS</td>
<td>14.5 (6.5)</td>
<td>14.9 (5.1)</td>
</tr>
<tr>
<td>IAT Good/Bad(^3,5)</td>
<td>9.2 (8.0)</td>
<td>12.9 (5.3)</td>
</tr>
<tr>
<td>IAT Motivated/Lazy(^3)</td>
<td>8.2 (5.9)</td>
<td>8.8 (5.0)</td>
</tr>
</tbody>
</table>

\(^a\) Significant difference between conditions over time  
\(^b\) AF condition change> control group change  
\(^c\) TP condition change> control group change  
\(^d\) PF condition change> control group change  
\(^e\) TP condition change> AF condition change  
\(^f\) PF condition change> AF condition change  
\(^g\) PF condition change> TP condition change  

1. Table contents display means and standard deviations of variables prior to transformation to correct significant skew and kurtosis  
2. Average percentage ratings for 10 positive or negative traits  
3. Discrepancy in bias when negative adjectives (bad or lazy) are paired with fat vs. when positive adjectives (motivated or good).  
4. Significant interaction between conditions over time  
5. Significant main effect over time
Table 3. *Pearson Correlation Matrix Examining Relationships Between Measures of Bias* (N=131)

<table>
<thead>
<tr>
<th></th>
<th>MCSDS</th>
<th>Good/Bad IAT</th>
<th>Mot/Lazy IAT</th>
<th>Controllability</th>
<th>Fear</th>
<th>Dislike</th>
<th>OPTS Negative</th>
<th>OPTS Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCSDS</td>
<td>1</td>
<td>.10</td>
<td>-.01</td>
<td>-.01</td>
<td>.16</td>
<td>-.20*</td>
<td>-.10</td>
<td>.07</td>
</tr>
<tr>
<td>Good/Bad IAT</td>
<td></td>
<td>1</td>
<td>.17</td>
<td>-.10</td>
<td>-.01</td>
<td>-.06</td>
<td>.14</td>
<td>.16</td>
</tr>
<tr>
<td>Mot/Lazy IAT</td>
<td></td>
<td></td>
<td>1</td>
<td>-.15</td>
<td>-.19</td>
<td>-.04</td>
<td>-.05</td>
<td>.16</td>
</tr>
<tr>
<td>Controllability</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>-.18</td>
<td>.49**</td>
<td>.52**</td>
<td>-.20*</td>
</tr>
<tr>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>-.13</td>
<td>-.12</td>
<td>.02</td>
</tr>
<tr>
<td>Dislike</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>.36**</td>
<td>-.30**</td>
</tr>
<tr>
<td>OPTS Negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPTS Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4. *Participant Endorsement of Open-Ended Motivational Form Questions*

Percentage of Endorsement of Changes in Answers on the Motivational Form within Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Control Group</th>
<th>AF</th>
<th>TP</th>
<th>PF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>12.1</td>
<td>22.9</td>
<td>43.3</td>
<td>57.6</td>
</tr>
<tr>
<td>No</td>
<td>87.9</td>
<td>77.1</td>
<td>56.7</td>
<td>42.2</td>
</tr>
</tbody>
</table>

Percentage of Rationale Endorsement for Answers of the Motivational Form within Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Control Group</th>
<th>AF</th>
<th>TP</th>
<th>PF</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSI¹</td>
<td>0</td>
<td>16.7</td>
<td>16.7</td>
<td>65.3</td>
</tr>
<tr>
<td>ISI²</td>
<td>0</td>
<td>16.7</td>
<td>16.7</td>
<td>27.0</td>
</tr>
<tr>
<td>Other</td>
<td>100.0</td>
<td>66.6</td>
<td>66.6</td>
<td>27.0</td>
</tr>
</tbody>
</table>

Percentage of Rationale Endorsement for NSI and ISI Categories

<table>
<thead>
<tr>
<th>Condition</th>
<th>AF</th>
<th>TP</th>
<th>PF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationale 1</td>
<td>8.3</td>
<td>8.3</td>
<td>19.2</td>
</tr>
<tr>
<td>Rationale 2</td>
<td>4.2</td>
<td>4.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Rationale 3</td>
<td>0</td>
<td>0</td>
<td>19.2</td>
</tr>
<tr>
<td>Rationale 4</td>
<td>0</td>
<td>0</td>
<td>7.7</td>
</tr>
<tr>
<td>Rationale 5</td>
<td>4.2</td>
<td>4.2</td>
<td>0</td>
</tr>
<tr>
<td>Rationale 6</td>
<td>0</td>
<td>0</td>
<td>7.7</td>
</tr>
<tr>
<td>Rationale 7</td>
<td>4.2</td>
<td>8.3</td>
<td>0</td>
</tr>
<tr>
<td>Rationale 8</td>
<td>4.2</td>
<td>4.2</td>
<td>7.7</td>
</tr>
<tr>
<td>Rationale 9</td>
<td>8.3</td>
<td>4.2</td>
<td>0</td>
</tr>
</tbody>
</table>

**Normative Social Influence**
1. I often change my thoughts based on others
2. I didn’t want to stick out as different/want to be normal
3. I didn’t want to seem judgmental /rude/biased/prejudiced
4. I didn’t feel comfortable sharing my real opinion in front of others/ I felt bad about my own biases
5. After seeing how others felt, I felt o.k. to report my true opinions
6. The obese person in the experimental group changed my response

**Informational Social Influence**
7. I wanted my answer to be valid for research purposes/wanted to be accurate
8. Lots of other people’s opinion must be more accurate than mine alone
9. I was swayed by others because I wasn’t sure of my beliefs to begin with

**Other**
10. It’s how I feel /my mood changed
11. Had more time to really think about it by the second assessment point
12. My own weight status kept my answers consistent (obese-I know what it is like, not obese-I don’t know)/ tried to answer out of personal experience both times.
13. I am opinionated/steadfast/confident in my own beliefs
14. I already thought my beliefs were positive
15. I didn’t really think about it/didn’t pay attention
16. Used 50% for all answers because I didn’t know and wanted to be fair
17. I wanted to be consistent with my previous estimate
18. The manipulation wasn’t strongest enough to change my beliefs/ The numbers seemed too high to be believable
19. I received no feedback

Number of Participants Endorsing types of Rationales on the Motivational Form within Conditions

<table>
<thead>
<tr>
<th></th>
<th>NSI</th>
<th>ISI</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0</td>
<td>0</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>AF</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>TP</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>PF</td>
<td>17</td>
<td>2</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>10</td>
<td>61</td>
<td>96</td>
</tr>
</tbody>
</table>

1Normative Social Influence
2 Informational Social Influence
Table 5. *Post Hoc Analyses of significant interactions on the AFAQ and OPTS*

<table>
<thead>
<tr>
<th>Positive OPTS</th>
<th>Negative OPTS</th>
<th>Dislike Scale on the AFAQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control vs AF</td>
<td>Control vs AF</td>
<td>Control vs AF</td>
</tr>
<tr>
<td>Control &lt; TP**</td>
<td>Control vs TP</td>
<td>Control &lt; TP*</td>
</tr>
<tr>
<td>Control &lt; PF ***</td>
<td>Control &lt; PF***</td>
<td>Control vs PF</td>
</tr>
<tr>
<td>AF vs. TP</td>
<td>AF vs. TP</td>
<td>AF vs. TP</td>
</tr>
<tr>
<td>AF vs PF</td>
<td>AF &lt; PF **</td>
<td>AF vs PF</td>
</tr>
<tr>
<td>TP vs. PF</td>
<td>TP &lt; PF ***</td>
<td>TP vs. PF</td>
</tr>
</tbody>
</table>

*P < .01, **P < .001, ***P < .0001
Table 6. *Summary of Study Hypotheses*

<table>
<thead>
<tr>
<th>OPTS</th>
<th>AFAQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PF would reduce in bias over time more than it would in the AF on both positive and negative traits</td>
<td>1. AFAQ would be significantly correlated with the OPTS</td>
</tr>
<tr>
<td>2. PF would reduce in bias over time more than it would in the TP on both positive and negative traits</td>
<td>2. IAT would not be correlated with the AFAQ.</td>
</tr>
<tr>
<td>3. TP would reduce in bias over time more than it would in the AF on both positive and negative traits</td>
<td></td>
</tr>
<tr>
<td>4. All experimental conditions&gt;control group on both positive and negative traits</td>
<td></td>
</tr>
</tbody>
</table>
Confidence Ratings
1. Decreased baseline confidence would be related to increased change in bias over time

Implicit and Explicit Bias
1. Implicit bias would be evident
2. Implicit bias would not be related to explicit bias
3. Implicit bias would change less than explicit bias
4. There would be a significant change in implicit and explicit bias in PF and TP

Social Desirability
1. Higher baseline social desirability would be related to higher changes in bias over time in the PF only

Motivational Ratings
1. ISI in TP would be greater than ISI in other conditions
2. ISI in the AF would be greater than ISI in the PF or in the control group
3. NSI in would be greater in the PF than NSI in any of the other conditions
Figure 1. Significant Interaction on Positive OPTS Between Condition and Change over Time

AF: Anonymous Social Consensus Condition, TP: Trait Prevalence Condition, PF: Public Feedback Condition

*a Significantly more reduction in bias than control group over time

b Significantly more reduction in bias than the AF over time
Significantly more reduction in bias than the TP over time
Main effect for this condition over time

Figure 2. Significant Interaction on Negative OPTS Between Condition and Change over Time***

AF: Anonymous feedback Condition, TP: Trait Prevalence Condition, PF: Public Feedback Condition
*p < .01, **p < .001, ***p < .0001

Significantly more reduction in bias than control group over time
Significantly more reduction in bias than the AF over time
Figure 3. Significant Main Effect Good/Bad IAT over Time ($p < .01$)

AF: Anonymous feedback Condition, TP: Trait Prevalence Condition, PF: Public Feedback Condition

\[ \text{Significantly more reduction in bias than control group over time} \]
\[ \text{Significantly more reduction in bias than the TP over time} \]
\[ \text{Main effect for this condition over time} \]
c Significantly more reduction in bias than the TP over time

Main effect for this condition over time

Figure 4. Significant Interaction on Dislike Subscale Between Condition and Change over Time ($p = .02$)

a Significantly more reduction in bias than control group over time

b Significantly more reduction in bias than the AF over time

AF: Anonymous feedback Condition, TP: Trait Prevalence Condition, PF: Public Feedback Condition

*p < .01, **p < .001, ***p < .0001
c Significantly more reduction in bias than the TP over time

d Main effect for this condition over time