THE IMPACTS OF ATTENTIONAL BIASES AND IMPLICIT ATTITUDES ON BODY DISSATISFACTION: APPLICATION OF THE TRIPARTITE INFLUENCE MODEL OF BODY IMAGE

by

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A dissertation submitted to the Graduate School-Newark

Rutgers, The State University of New Jersey

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Graduate Program in Psychology

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Newark, New Jersey
May 2014

ABSTRACT OF THE DISSERTATION

The Impacts of Attentional Biases and Implicit Attitudes on Body Dissatisfaction:

Application of the Tripartite Influence Model of Body Image

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Body dissatisfaction pervades Western society. Men and women alike experience negative feelings about their bodies because their physical appearance is not "ideal" according to societal norms of beauty. Such negative evaluations of one's body can exacerbate or trigger the development of disturbed body image and disordered eating behavior. According to current social-cultural theories of body dissatisfaction, exposure to Western media is a defining factor in the development of body dissatisfaction. One such theory, the Tripartite Influence Model (TIM) of body image, posits that internalization of societal ideals and social comparisons mediate the effects of the core social influences; namely, family, peer, and media, on body image distortions and body dissatisfaction. Problematic social comparison, a mediator in the TIM, may manifest as a bias in visual attention in which one visually compares one's own body to the ideal body type that is glamorized in Western media. Further, to the extent that social influences promote the idealization of "thin" or "muscular" body types, individuals should hold positive evaluations (implicit attitudes) of such body types during social comparison.

Visual attentional biases additionally might strengthen these existing internalizations of societal ideals, resulting in a vicious self-perpetuating cycle.

The five psychophysical studies described here investigated these two potential components that existing models of body dissatisfaction may require; namely, attentional biases and implicit attitudes. Findings across these experiments lend support to the hypothesis that biases in visual attention do meaningfully contribute to the maintenance of body dissatisfaction, though this relationship is more complex than originally conceived. Further, the results of Experiments 3 and 4 preliminarily support meaningful relationships between implicit attitudes towards specific body types and both visual attentional biases and body dissatisfaction. Finally, Experiment 5 measures the direct, causal effects of visual attentional training on body dissatisfaction. Taken together, these experiments introduce an innovative approach to the study of body dissatisfaction and eating disorders providing strong implications for treatment and prevention.

Dedication

This dissertation is dedicated to my loving wonderful parents Rameau and Christa Joseph, as well as to my big brother Billy. I would have never made it anywhere without the selfless love and support you all have given me. Mami and Papi, you have gone above and beyond the responsibilities of a parent to ensure that I would become the very best I could be. You two never allowed me to settle for anything less because you saw the potential in me that I could not see. At times you would give me advice that I did not want to hear, but I am so glad I listened and it has gotten me where I am now. The joy that I see on your faces as I get closer and closer to accomplishing my goals lights a burning fire inside of me that pushes me to work harder and not give up. I've worked so hard not only for myself but for you two. My accomplishments are your accomplishments and I will forever be grateful for your dedication to me. I love you two with all my heart and I am so blessed to have you as parents and I'm so proud to be your daughter.

Oh Billy Boy, I couldn't have asked for a better big brother to look up to. I am so proud of all you have accomplished and I truly inspire to be like you. You've always been focused and goal driven. Seeing you reach your goals showed me that if I worked hard and stayed focus, I could attain any goal no matter how distant and unattainable it may seem. I am extremely proud of your accomplishments, but most importantly I am extremely proud to be your sister and I will always love and support you the way you have done for me throughout the years. Thank you for being a great big brother that showed me the reality of reaching ones dreams.

Acknowledgements

First and foremost, I thank Jehovah God for giving me the opportunity, strength, and perseverance to complete this dissertation. I would also like to thank the many people in my life who've made this dissertation possible. I am forever grateful for my amazing advisor Maggie Shiffrar for the endless guidance, support, encouragement, and trust to pursue research that I love. Throughout the years you have taught me something more valuable than how to conduct good research, you've taught me the importance of being humble. You are one of the most intelligent people I know; yet you are also the most modest person I know. Your modesty has garnered in me so much respect for you. I hope that as I continue to grow and learn I can reflect your humble attitude. Thank you!

I would also like to express my gratitude to my wonderful committee members, Tom Hildebrandt, Vanessa LoBue, and Luis Rivera. You all have been extremely helpful, patient, and so generous of your time. Most importantly, the excitement and interest you all have shown in my work has reassured me that I must be on the right path and doing something good; I truly thank you all for that. I would like to thank all my research assistants who have spent many long hard hours assisting me with data collection, Anar, Diane, Briana, Meetali, Russell, Tahnia, Jennifer, and Allison. I would like to give John Franchak a special thank you. You have been a constant since I've started my journey in 2007. You've always been kind and helpful and I thank you for that.

I would like to give a special thank you to my fellow graduate students, friends, and colleagues from the Visual Cognition Lab, past and present; Ashley, James, Steve, Adam, Martha, Songjoo, and Sapna. You all have been mentors and truly good friends to

me throughout the years. I would like to thank the Psychology Department for years of support, and special thanks to Sarah Savoy for her mentorship and Ellen Halpern and Valerie Law for their statistical help. Many thanks to Jacob Duijnhouwer for his assistance with stimuli creation. I would also like to thank the Minority Biomedical Research Support Program for the years of financial support and mentorship.

Finally, a very special and loving thank you to my family and friends who've been with me throughout this difficult but rewarding journey. Your love, support, understanding, encouragement, and confidence in me were like fuel that kept me going. Faith, I truly thank you for being a great friend and supporting me during the times I felt like I couldn't go any farther; you are a wonderful beautiful friend and I will always cherish our friendship.

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CHAPTER 1: INTRODUCTION

1.1 Body Dissatisfaction

1.1.1 Socio-cultural Theories of Body Dissatisfaction

Body dissatisfaction is the negative self-evaluation of one's bodily size, shape, weight, or musculature (Stice & Shaw, 2002). Extensive research has been conducted on body dissatisfaction because it consistently predicts several major health risks including depression, obesity, body dysmorphic disorder, anabolic steroid use, anorexia nervosa, and bulimia nervosa (e.g., APA, 1994; Hildebrandt et al., 2011; Kanayama et al., 2001; Thompson, 2004; Tylka, 2004; Keel & Klump, 2003) as well as the likelihood of plastic surgery (Crerand et al., 2006). According to socio-cultural theories, body dissatisfaction arises from the frequent comparison of one's own body with societally idealized bodies (Levine et al., 2011; Trottier et al., 2007; & Heinberg, 1996). It is presumed that the discrepancy between one's body and the ideal body naturally gives rise to negative feelings about one's own body, thus making body dissatisfaction a key cognitive-affective component of body image.

The socio-cultural theory of body dissatisfaction (Thompson, Coovert, & Stormer, 1999) posits that the belief that a very thin body is, by definition, inherently good necessarily leads to the corollary that one's own body is bad if it is not thin. This thin body ideal, which is prevalent in Western media, is understood as giving rise to and maintaining body dissatisfaction in Western cultures. Consistent with this, social pressure to be thin has been found to positively correlate with increased levels of body dissatisfaction (Presnell, Bearman, & Stice, 2004). Furthermore, in experimental studies,

correlations have been found between visual exposure to media that extol the beauty of thin female bodies, including TV and magazines, and increases in body dissatisfaction amongst women (Levine & Smolak, 1996; Hausenblas, Janelle, & Gardner, 2004; Dittmar & Howard, 2004). In a 3-year longitudinal study conducted in Fiji, it was found that the introduction of Western media, which exerts pressures to be thin, triggered significant increases in body concerns and dissatisfaction amongst Fijian women (Becker, 2004). The open-interviews conducted by these researchers obtained responses from these young Fijian women such as,

> "Sometimes we can see on TV . . . teenagers and they are very slim. They are the same ages but they are working, they are slim and they are very tall and they are cute, nice, so from there we want ourselves or we want our bodies to become like that. So we try to maintain our weight, try to lose a lot of weight to become more like them." (546)

These and other studies support the hypothesis that socially constructed attitudes (i.e., thin equals good) impact body dissatisfaction. Thus, the now classic socio-cultural model posits that Western media, which idealize "skinny" women, put immense pressure on women to meet nearly impossible standards of physical beauty which in turn increases the risk of increased body dissatisfaction and, subsequently, eating disorders in women (Trottier & Herman, 2007). While the effects of media defined bodily ideals may not be limited to Western cultures, a study comparing body dissatisfaction amongst Taiwanese-American women and Taiwanese women confirms that Taiwanese-Americans who acculturate, and thus are exposed more to Western cultural influences, exhibit higher levels of body dissatisfaction than their Taiwanese counterparts (Tsai, Curbow, & Heinberg, 2003).

A fundamental prerequisite of theories of body dissatisfaction is that observers have internal representations or images of their own body. According to Thompson (1990), the body image is a multidimensional representation that includes a person's thoughts, feelings, behavioral responses to, and perception of his or her own body. Vocks (2007) specifies three components of body image: cognitive-affective, behavioral, and perceptual. Body dissatisfaction is thought to depend upon the cognitive-affective component of body image. For example, body dissatisfaction can include feelings of disgust towards one's own overweight body. It is important to note that the experiments described in this dissertation do not include studies of the perceptual component of body image; that is, one's bodily self-perception. In other words, the studies described below will not measure how accurately individuals perceive the size or weight of their own body or the bodies of others. Self-perceptions, whether accurate or not, may not result in behavioral responses if an individual is not highly concerned about their appearance. Therefore, it seemed most important to investigate the cognitive-affective component of body image; that is, one's evaluative feelings about one's own body and how that might relate to biased patterns of social comparison.

The Tripartite Influence Model (TIM) of Body Image (see Figure 1) (Thompson et al., 1999b; Van de Berg, Thompson, Obremski-Brandon, & Coovert, 2002), proposes three core sources of social influence that define body image development: one's peers, parents, and media. Body image is a term used to describe one's subjective picture or internal representation of one's own physical appearance; that is, your perception of your own body. Body images are constructed from both self-observation as well as social comparison; namely, perceptually comparing your body with the bodies of others.

According to the TIM, internalization and social comparison mediate the effects of family, peer, and media influences on body image distortions, and body dissatisfaction, that lead to disturbed eating behavior. Classic theories of social comparison posits people will compare themselves to similar others or others that are relevant to them (Festinger, 1954). Specifically, upward social comparison occurs when an individual compares himself or herself to someone who is superior to them in a specific attribute, for example physical appearance. This form of social comparison (upward) is beneficial for improving oneself (Wilson & Ross, 2000). For instance, a person who is overweight may make an upward social comparison to someone who is thinner and thus superior to them in that respect. Such a comparison may result in two possible outcomes: (1) the person may diet and exercise to become thin and essentially "better" themselves or (2) the person may lower their self-esteem because they are not thin and thus inferior to the other person in which they are comparing themselves to. Upward social comparison is presumed in Western media because actors and models in the media are thinner than the typical American. One study found upward social comparison to models presented in media made participants feel worse about their physical appearance (Strahan, Wilson, Cressman, & Buote, 2006). Similarly, in the real world, such upward social comparisons to idealized bodies in the media and to ideal bodies in one's environment can be deleterious to body satisfaction and self-esteem.

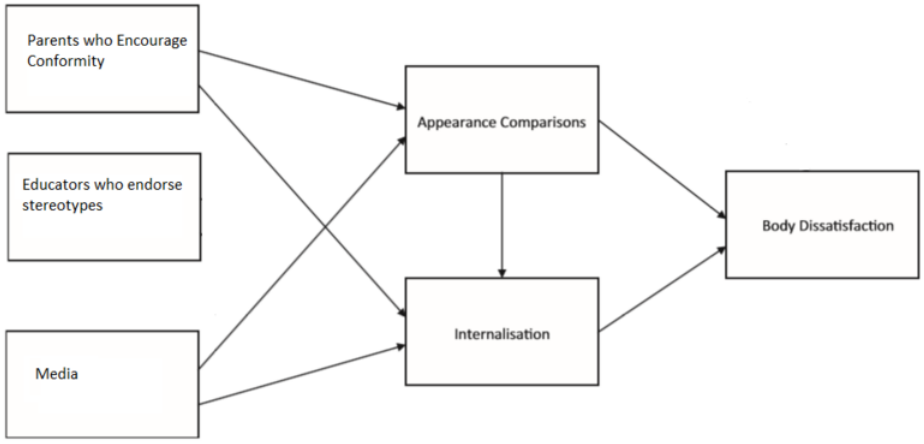

Figure 1. Tripartite Influence Model of Body Image Development (van de Berg et al., 2002).

The results of covariance structure modeling indicate that within the TIM, media influences hold a strong pathway to appearance comparison (Van den Berg et al., 2002). These results parallel those from research supporting social-cultural theories of body dissatisfaction in which exposure to Western media is thought to play a defining role in the development of body dissatisfaction (Levine & Smolak, 2013; Hausenblas, Janelle, & Gardner, 2004; Dittmar & Howard, 2004). The TIM is also consistent with the finding that appearance-based bodily comparison mediates body dissatisfaction and eating disorders (Thompson et al., 1999). However, the TIM does not include pathways that link specific visual processes and/or implicit evaluations to appearance comparison and body dissatisfaction. Current research suggests that appearance comparison should be associated with, or may even give rise to, biases in the deployment of visual attention towards idealized body types (Glauert et al., 2010). In other words, bodily appearance comparison, as predicted in the TIM as resulting from core social influences (parents,

peers, and media), could manifest itself in the form of attentional biases that in turn exacerbate body dissatisfaction (see Figure 2). In like manner, appearance comparison could also lead to greater internalization of societal ideals and the strengthening of positive associations with societally idealized body types. To the extent that social influences promote the idealization of "thin" or "muscular" body types, individuals should hold positive evaluations of such body types during upward social comparison. If individuals hold positive associations towards a particular body type (thin, fat, or muscular), then they may exhibit a tendency to visually attend to that body type. In like manner, negative associations may lead to an aversion of visual attention. If so, the strength of implicit and explicit associations should moderate visual attentional biases towards specific body types, i.e., ideal and non-ideal body types. In the current studies, only implicit associations are measured to avoid intentional responses from participants who may not feel comfortable reporting the negative associations they may hold towards non-ideal or even ideal body types.

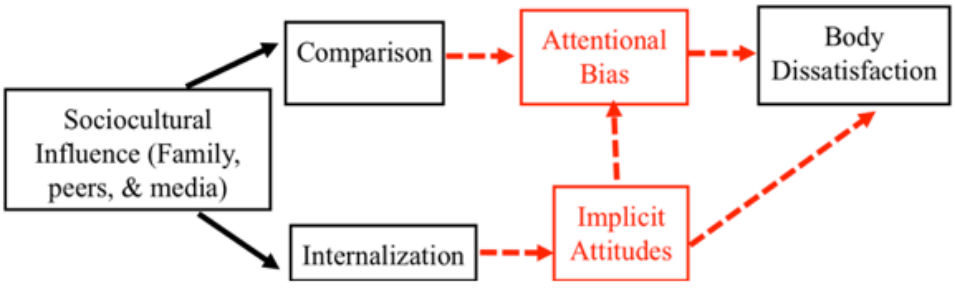

Figure 2. Potential modifications (in red) of the Tripartite Influence Model (TIM)

Conducted body image research has documented the impact of Western media's emphasis on thinness on body dissatisfaction in women (Cafri, Yamamiya, Brannick, & Thompson, 2005). For example, a meta-analysis study (Cafri et al., 2005) found that internalization of socio-cultural ideals held the strongest relationship to body image as measured by the Eating Disorders Inventory–Body Dissatisfaction subscale (EDI–BD) (Garner & Olmsted, Polivy, 1983). However, careful consideration of two distinctive body image constructs; namely, evaluation and investment, is necessary to fully understand the relationship between thin idealization and body dissatisfaction. Body image evaluation is the assessment of how satisfied or dissatisfied individuals are with their appearance. Body image investment is the value that individuals place on their appearance (Cash, 2005). For instance, a person may not be satisfied with how they look (evaluation) but such a negative evaluation may not necessarily be important to them (low investment) thus have no behavioral consequences. High body image investment can have detrimental effects, especially for those who are not satisfied with their bodies. In other words, an important aspect of body image investment is the self-evaluative salience of appearance, in which a person defines their self worth by their appearance (Cash, 2005). Thus, individuals who are dissatisfied with their body and who overvalue the importance of their body image can come to feel worthless, and as a result, may try any means necessary to reach their ideal body. Taken together, a negative self-evaluation of one's body coupled with high body image investment will presumably moderate the internalization of body ideals that causes body dissatisfaction. Consistent with this, disordered eating behavior in undergraduate women is predicted by womens' perceived importance of body weight and shape (investment) and bodily self-perception

(evaluation) (Frank & Thomas, 2003). Furthermore, feelings of self worth derived from one's body image are understood by many researchers as the root of some eating disorders (Fairburn & Cooper, 1993) and other dysfunctional behaviors such as extreme exercise regiments and excessive cosmetic surgery.

The vast majority of research on body dissatisfaction has been conducted on women (Grabe & Hyde, 2006). While men make up 10 to 15 percent of patients with eating disorders, research on male body dissatisfaction is quite limited (Carlat & Camargo, 1991). The research that has been conducted with men indicates that body dissatisfaction in men predicts the development of eating disorders and other maladaptive behaviors such as steroid use (McCabe & Ricciardelli, 2004). Though it is becoming evident that men too experience body dissatisfaction, the same socio-cultural theories based on the thin ideal cannot easily be applied to men. The next section will review gender differences in body dissatisfaction and the systematic differences between men and women.

1.1.2 Gender Differences and Body Dissatisfaction

There is an abundance of research documenting the adverse consequences of body dissatisfaction in women. Women with high levels of body dissatisfaction are at risk of developing an eating disorder. Such women can also suffer from psychosocial impairments, suicide attempts, and psychiatric disorders such as anxiety, substance abuse, and mood disorders (Newman et al., 1996; Thompson et al. 1999). Body dissatisfaction is not restricted to clinical eating disorders but extends to maladaptive behaviors that attempt to change physical appearances. Such behaviors include fasting and skipping meals, excessive exercise, purging, taking laxatives, diuretics, and appetite suppressants, and

restricting carbohydrate and fat intake (Tylka, 2004; Tylka & Subich, 2002; Mintz & Betz, 1988, Rosen & Gross, 1987).

While there is limited research on male body dissatisfaction, it is clear that men experience it as well along with associated adverse effects. Important to note however, the male experience of body dissatisfaction systematically differs from the experience of women. For women, bodily ideals reflect a drive towards thinness while bodily ideals in men tend to reflect a "drive for muscularity" in which "bigger is better" (McCreary et al., 2004; Hildebrandt et al., 2004; Sweeting, 2008). Consistent with this, overweight men are three times more likely than overweight women to be satisfied with their weight (Green et al., 1997). Men report wanting to gain, on average, 28 pounds of muscle mass and when they want to lose weight, the goal is to increase muscle visibility (Pope et al., 2000; Cafri et al., 2006). Increasing rates of body dissatisfaction among men have been attributed to increases in the prevalence of a muscular or mesomorphic male body ideal that is instilled through Western mass media (e.g., Leit et al., 2002). Conversely, women desire to look thin rather than large (Lenart et al., 1995). Such gender differences in body satisfaction and body ideals appear to emerge during childhood (Ricciardelli & McCabe, 2001).

As with women, the internalization of Western ideals of male body types predicts body dissatisfaction in men (Warren, 2008). Yet, unlike women, the male body ideal of Western cultures reflects a combination of leanness and musculature (Tiggermann, Martins, & Kirkbride, 2007). For example, the same proportions of men desire to loose weight (40%) and gain weight (45%) in order to fit the masculine bodily ideal (McCabe & Ricciardelli, 2004; Drewnowski & Yee, 1987). Further**,** a meta-analysis of the few studies investigating male body image has revealed the complexity of male body image,

implicating multiple contributing factors to the development of body dissatisfaction in men. These factors include body build, levels of acculturation, socio-economic status, media exposure, and internalization of the muscular and lean body ideal (Ricciardelli, McCabe, Williams, & Thompson 2007). Clearly, body dissatisfaction in men is a complex phenomenon.

As mentioned above, male body image includes a focus on attaining the ideal body composition of muscularity and leanness (to maximize muscle visibility) along with being tall and having broad shoulders, a slim waist and a well-defined chest (Cafri et al., 2005; McCabe & Riccardeli, 2004; Cafri & Thompson, 2004). Parallel to the literature linking exposure to Western media and body dissatisfaction in women, amongst men, exposure to ultra-muscular male models also increases body dissatisfaction (e.g., Agliata & Tantleff-Dunn, 2004; Farquhar & Wasylkiw, 2007; Barlett et al., 2008). Over the past 30 years, action figures designed primarily for boys, including Superman and G.I. Joe, have increased in muscularity to such an extent that they now far exceed the muscular capacity of the human body (Pope et al., 1999; Baghurst et al., 2006). For example, the current circumference of G.I. Joe's bicep is 26.8 inches – clearly unrealistic. Exposure to such impossibly muscular action figures increases body dissatisfaction in boys (Bartlett et al., 2005). Similarly, in girls, exposure to impossibly thin Barbie dolls increases body dissatisfaction (Dittmar, Halliwell & Ive, 2006).

An array of mental disorders and maladaptive behaviors can result from body dissatisfaction in men. For example, body dissatisfaction in males can lead to muscle dysmorphia; a class of psychological disorders that is characterized by an extreme drive to become objectively more muscular than the typical male (Pope, Gruber, Choi,

Olivardia, & Phillips, 1997). Males suffering from muscle dysmorphia experience shame, high levels of anxiety, engage in excessive weight/strength training, consume a large amount of calories, exhibit maladaptive eating behaviors, and increased use of anabolic-androgenic steroids (Hilderbrandt, Schlundt, Langenbucher, & Chung, 2006; Olivardia, Pope, & Hudson, 2000). Body dissatisfaction in men that does not result in muscle dysmorphia still constitutes a health threat as it triggers maladaptive behaviors such as dysfunctional eating patterns. Men experiencing these behaviors may consume large amounts of food to gain weight or restrict food consumption to lose weight depending on appearance goals (Cafri et al., 2005). Dysfunctional eating patterns are commonly seen in competitive athletes such as wrestlers and boxers (Klien, 2007) but are becoming apparent in noncompetitive athletes who experience pressure to attain the male body ideal.

In addition to extreme exercise and dieting regimes, men with body dissatisfaction who want to change their appearance often use performance enhancing drugs or steroids to assist them in reaching their appearance goals (McCreary, 2007; Hildebrandt, Langenbucher, Carr, & Sanjuan, 2007). These include over the counter workout supplements, such as fat burners and anabolic androgenic steroids (AASs). There are numerous emotional and physical side effects associated with the use of AASs including, but not limited to, depression, anxiety, acne, testicularatrophy, and potentially deadly cardiovascular problems (Kuipers, 2003; Hildebrandt, Langenbucher, Caarr, Sanjuan, & Park, 2006). The negative moods resulting from AAS use also increases the likelihood of suicide (Petersson et al., 2006).

The clear linear relationship between body dissatisfaction and weight observed in women is more complex in men making it insufficient to apply current theories of body dissatisfaction directly to men. As discussed above, men are concerned with muscularity as well as leanness, resulting in a disconnect between men who want to loose weight (body fat) and men who want to gain weight (muscles mass). Taken together, it is clear that the failure to rigorously investigate body dissatisfaction in males is a mistake that needs to be addressed immediately, given the growing incidence of eating disorders, muscle dysmorphia, and AAAs abuse in men. The next section will discuss a possible mediator of this disconnect in the relationship between weight and body dissatisfaction in men; namely, sexual orientation.

1.1.3 Sexual Orientation and Body Dissatisfaction

Sexual orientation appears to modulate body dissatisfaction in men as homosexual men are more likely than heterosexual men to internalize the thin body ideal and are more prone to develop an eating disorder (Andersen, 1999). Some have argued that the gay subculture imposes extra pressure to look youthful and thin and that this pressure may lead to greater occurrences of body dissatisfaction (Lakoff & Scherr, 1984; Seiver, 1994). Theories suggest that gay men may be more vulnerable to body dissatisfaction and eating disorders because of an overarching emphasis on appearance in the gay male subculture (Bailey, Gaulin, Agyei, & Gladue, 1994; Morrisson, Morrisson, & Sager, 2004; Peplau et al., 2009). The role of sexual orientation in body dissatisfaction amongst women is less clear. The results of several studies suggest no significant differences in eating disorder symptoms between homosexual, heterosexual, and bisexual women (Keel & Klump,

2003; Share & Mintz, 2002; Heffernan, 1994). These studies corroborate the notion that gender is a more important factor than sexual orientation, suggesting that all women may be equally susceptible to body dissatisfaction and disordered eating symptoms. On the other hand, several researchers have argued that at least with women, eating disorders may be a disease specific to white women of high socioeconomic status (Gluck & Geliebter, 2002; Phelps & Bajorek, 1991; Stern et al., 1984). According to this theory, women from different, non-white ethnic/racial groups may be "buffered" from eating disorders and body dissatisfaction, a theory known as the race-buffering hypothesis. The next section discusses this hypothesis.

1.1.4 Race-buffering hypothesis

According to buffering-hypotheses, ethnic minorities are shielded from Western cultural ideals of thinness and hold larger body ideals (Sabik et al., 2010; Molloy, 1988). Consequently, minorities are thought to experience lower levels of body dissatisfaction (Wildes & Emery, 2001; Grabe & Hyde, 2006; Roberts et al., 2006; Warren et al., 2005). For example, in several studies, White women report higher levels of body dissatisfaction than either Black or Hispanic women (e.g., Duncan et al., 2003). Yet, other studies report no such differences (Grabe & Hyde, 2006 for review). Indeed, differences in body dissatisfaction across ethnic groups may be diminishing as more African-American women are reporting body dissatisfaction (Roberts et al., 2006). The underlying causes of such group differences in body dissatisfaction are under debate (e.g., Sabik et al., 2010). However, to date, no empirical research has directly examined the relationships between ethnicity, body dissatisfaction, and attentional biases toward bodies. As will be discussed

in later sections, attentional biases play a key role in body dissatisfaction. A recent study suggests that increased visual exposure to idealized thin bodies triggers body dissatisfaction in Black women just as it does in White women suggesting Black women are not buffered as previously posited (Wood, & Petrie, 2010). Considering the evidence discussed, examining group differences such as gender, ethnicity, and sexual orientation becomes relevant to the study of body dissatisfaction and critical to models that predict its development.

1.2 Visual attention and body dissatisfaction

Visual attention is thought to mediate the cognitive processes that underlie body dissatisfaction because visual attention is needed to directly compare one's own body with another's body (Smith et al., 2006; Cooper et al., 1992). However, visual environments are complex and as a result, visual attention tends to be distributed amongst a subset of stimuli in any scene. So what factors guide our attention to body related stimuli? Previous research has shown that observers' attitudes can guide visual attention such that observers visually attend to stimuli that conform to their attitudes and beliefs (Roskos-Ewoldsen & Fazio, 1992). If a female places a high positive value on thin bodies or desires to be thin, then she might selectively direct her attention toward thin bodies and stimuli related to thinness.

Roskos-Ewoldsen and Fazio (1992) examined how attitudes selectively guided visual attention. In this study, participants repeatedly made evaluative like-dislike judgments towards objects in order to manipulate accessibility of particular attitudes towards depictions of objects like a purse or plane. After such attitudes were

manipulated, participants performed a detection task in which they viewed displays containing items that were related and unrelated to their recently accessed attitudes. Participants detected more items that related to their attitudes than unrelated items suggesting that they had oriented their attention to attitude related items. These findings support the conjecture that selective attention can reveal attitudes and motivated several studies investigating the role of selective attention in creating and maintaining body dissatisfaction.

Our visual attention may impact body dissatisfaction by guiding our attention to entities in our environment that conform to our beliefs and feelings about the ideal body. People spontaneously allocate their attentional resources to the most useful sources of information in their environment (Fox, 2005). Our visual system thus prioritizes useful information by automatically directing our attention to stimuli that we like, need, and/or want. If social comparison theories dictate that we socially compare our bodies to others (Levine et al., 2011; Trottier et al., 2007; & Heinberg, 1996), then we must to attend to these bodies in order to perform those social comparisons.

The first experimental studies examining the role of selective attention in relation to body dissatisfaction utilized the Stroop color-naming task (e.g., Sackville et al., 1998; Lovell et al., 1997). For example, Cooper and colleagues (1992) used the Stroop task to determine whether individuals with bulimia nervosa selectively attend to information related to eating, shape, and weight. Individuals with bulimia nervosa experience high levels of body dissatisfaction. If individuals are preoccupied with eating and food related attitudes, then their performance on Stroop tasks should demonstrate greater interference (slowed reaction times or RTs) during the naming of the font color of food related words

relative to food unrelated words. As predicted, these authors found that individuals with bulimia nervosa experienced more interference naming the color of words related to eating, weight, and shape relative to unrelated control words. Bulimic subjects also experienced more interference compared to a non-eating disordered control group. These findings provide clear evidence that participants with bulimia nervosa selectively process information related to eating, weight, and shape that conform to their mental attitudes.

While the results of this study suggest a potential link between selective attention and body dissatisfaction, that link is limited by an experimental reliance on word stimuli. Further the different categories of words, either related to eating, weight, or shape; make it difficult to specify the exact type of word stimulus that preoccupies participants with eating disorders (ED). Referring back to the socio-cultural theory of body dissatisfaction, visual comparisons of bodies are a critical facet of the theory. Indeed, visual perception and comparison of one's own body with idealized bodies are thought to give rise to body dissatisfaction. Jansen and colleagues (2005) investigated selective visual attention for ugly and beautiful body parts in individuals with eating disorders. Visual depictions of ugly and beautiful body parts (from one's own body and the bodies of other women) were determined from participants' subjective evaluations. The parts considered most ugly by participants with eating disorders were the belly, hips, upper legs, and knees. Control participants with normal eating behavior identified upper legs, lower legs, hips, and knees as the ugliest. Details of the beautiful body parts were not described.

Cognitive models of eating disorders posit that individuals with disordered eating selectively attend to valued entities such as thin bodies (Viken et al., 2002; Hargreaves & Tiggermann, 2002). Using eye-tracking as a direct measure of attention, Jansen and

colleagues (2005) found that individuals with eating disorders, or high body dissatisfaction, selectively attended to the beautiful parts of others people's bodies while they selectively attended to subjectively defined ugly parts of their own bodies. The normal control group displayed the opposite behavior attending more to their own beautiful body parts and the ugly body parts of others. The observed selective attention to beautiful body parts of others by the clinical group suggests that these participants find these body parts desirable and evaluated them in a positive manner. The selective attention to one's own ugly body parts supports the idea that individuals with eating disorders focus their attention on regions of their own bodies with which they are dissatisfied, which likely reinforces their body dissatisfaction. These results lend support to the hypothesis that selective attention plays an important role in maintaining body dissatisfaction.

Further, Glauert and colleagues (2010) examined whether body dissatisfaction mediates selective attention to thin bodies with a different measure; namely, the dot-probe task. Given the premise of socio-cultural theories of body dissatisfaction that women compare themselves to other idealized female bodies, women should then allocate their attentional resources to thin bodies in their environment for the purposes of social comparison. Furthermore, women should selectively attend to these thin bodies because they conform to the attitude that thinness is good and desirable. In studies by Glauert and colleagues (2010), participants were presented simultaneously with the image of a thin and an overweight body positioned one above the other (see Figure 3). A probe arrow replaced the location of one of the two bodies and participants simply reported the direction in which the probe arrow pointed. A key premise of such dot-

probe tasks is that response times are speeded whenever the probe arrow appears in the area in which the participant was attending. If participants respond faster to a probe when it replaces the location of the thin body, then it would suggest that the participants had already directed their attention to the thin body, which allowed them to judge the arrow's direction more quickly. Glauert and her colleagues (2010) found that women overall selectively attended to thin female bodies regardless of their body dissatisfaction.

Figure 3. Depiction of Glauert et al. (2010) modified arrow-probe paradigm. Each trial starts with a central fixation, then a pair of bodies, and finally an arrow probe in a location previously occupied by one of the bodies.

These findings suggest that the general attitude that bodily thinness is good (regardless of whether it creates body dissatisfaction) is sufficient to mediate women's visual attention towards thin bodies. Though Glauert and her colleagues (2010) did not find a correlation between body dissatisfaction and attentional biases towards thin bodies, other studies have suggested such a relationship. For example, Smith and colleagues (2006) induced attentional biases towards negative shape and weight related words (e.g., enormous, huge, & blubber), neutral words (e.g., bottle, radio, glove), or negatively valence emotion words (e.g., awful, desperate, humiliated) using an Attentional Probe task. After the induction of either of the attentional biases, participants who were induced

to attend to negative shape and weight related words reported increased levels of body dissatisfactions while the control conditions did not. Taken together, the findings from the studies summarized above shed light on the cognitive mechanisms underlying body dissatisfaction. Attitudes about shape, weight, eating, and bodily ideals moderate attentional processes that reinforce these attitudes and maintain body dissatisfaction.

Research on the detection of threatening entities provides an alternative, though not necessarily contradictory, perspective on women's attentional biases toward thin bodies and weight and shape related words. Several studies support the threat superiority hypothesis according to which observers selectively attend to threatening stimuli (LoBue, Rakinson, & DeLoache, 2010; Trawalter et al., 2008). Attentional biases toward threatening stimuli develop early as even infants selectively direct their attention to images of threatening snakes (LoBue et al., 2010). Women with eating disorders and/or high levels of body dissatisfaction may spontaneously direct their attention to the thin bodies of other women because those bodies are threatening. However, to date, no study has examined how threatening thin bodies are to women with elevated levels of body dissatisfaction.

Existing literature points to several cognitive factors that can influence attentional biases based on attraction and threat. This being said, measuring underlying attitudes about different body types is also essential to understanding the mechanisms driving attentional biases towards such bodies. One useful tool is the Implicit Association Test (IAT), which can be used to evaluate how individuals evaluate attended stimuli. Using the IAT along with measures of attention allows for the study of the implicit associations that may contribute to the creation and/or maintenance of attentional biases. The

following section will further discuss implicit associations and how they may guide visual attention.

1.3 Unconscious Associations and Attentional Biases

Unconscious attitudes or associations reflect automatic cognitive processes that have been extensively studied in topics ranging from discrimination to sexuality (Greenwald, McGhee, & Schwartz, 1988). The Implicit Association Test (IAT) is a standardized measure of implicit associations that relies upon differences in response time latencies as an indicator of association strength (Greenwald et al., 1988). Interpretations of IAT data are based on the assumption that reaction times to trials that are congruent (strong associations) with participants' existing associations will be faster than the reaction times of trials that are incongruent (weak associations) with existing associations. For example, an individual who holds a strong association between thin bodies (construct) and positive attributes should respond faster when thin bodies are paired with positive words (congruent) than when thin bodies are paired with negative words (incongruent). In a now classic IAT study, reaction times were faster when observers viewed black faces paired with negative adjectives than with positive adjectives (Fazio et al., 1995) suggesting that the observers held unconscious negative associations with black faces. Numerous studies have validated that the IAT can accurately and consistently measure automatic associations (Greenwald, et al., 1988), thus making it a valuable tool in the study of implicit mechanisms that may drive body dissatisfaction and attentional biases.

As will be discussed in greater detail later, the current experiments include a study

of the implicit attitudes observers hold about bodily muscularity and thinness and whether those attitudes are associated with body-based attentional biases and body dissatisfaction. For example, women who display significant attentional biases towards thin bodies may also hold strong positive associations towards such body types and if so, this might implicate automatic associations as an important factor underlying attentional biases.

Previous researchers have developed a thin-ideal IAT to understand the pathology of disordered eating (Ahern & Hetherington, 2006). These authors found that participants who internalized the thin body ideal, a key construct of body dissatisfaction, displayed positive, implicit associations towards thin and negative associations towards fat. This IAT however was unable to adequately predict body dissatisfaction, suggesting these automatic associations may be insufficient to create body dissatisfaction. The current experiments were designed to examine whether implicit attitudes might promote body dissatisfaction by selectively biasing the spatial distribution of visual attention.

Automatic associations can also activate goals (Ferguson, 2008). A goal is theoretically defined as the behaviors and oriented plans that are executed to reach a desirable end state (Strack & Deutsch 2004). If we hold as a goal the attainment of the thin or muscular body ideal (construct of body dissatisfaction), then the theory of evaluative readiness (Ferguson, 2008) suggests that we should hold positive associations with goal related entities (e.g., thin or muscular bodies). Indeed, the holding of positive attitudes toward or evaluations of goal related entities are thought to facilitate goal achievement (Ferguson, 2008). So if one holds the goal of being thin, then one should hold positive attitudes towards objects and actions that are related to this goal; that is, thin

bodies, exercise, exercise equipment, etc. Mass media relentlessly spread societal ideals of beauty, whether thin or muscular, making those ideals nearly impossible to evade and conditioning (implicit attitudes) those exposed to them. Thus, such societal ideals are presumably easily accessible, activating goals such as attaining the societal norm of beauty. If such a goal is activated, then one should use his/or her means to attain it. Unfortunately, this may lead to maladaptive eating and exercise behaviors. Furthermore, an activated goal automatically orients attention towards goal related stimuli (Vogt et al., 2010). This automatic attention towards goal related stimuli suggests that attentional biases toward thin and/or muscular bodies may reflect an activated goal state for individuals with body dissatisfaction.

1.4 Overview of Experiments

The goal of this research program is to integrate studies of visual attention and implicit attitudes to advance current theories of body dissatisfaction. The current gold-standard theory of body image and body dissatisfaction development, the Tripartite Influence Model or TIM, asserts that the media is the most powerful trigger to increase body based social comparison (van den Berg et al., 2002). Body based social comparison, in turn, mediates body dissatisfaction (Thompson et al., 1998) as seen in studies in which women who visually compare themselves with thinner women experience increased body dissatisfaction (Trottier, 2007). According to the TIM, societal influences lead to internalization of body ideals. In women, this internalization results in positive, implicit associations towards thin bodies and negative associations towards fat bodies (Ahern & Hetherington, 2006). Finally, there is evidence that women in general attend to the ideal

thin body that is emphasized in western cultures (Glauert, 2010). These findings suggest a relationship between body dissatisfaction, visual attentional biases, and implicit associations. The current TIM model however does not include visual attentional or implicit associative processes, which is a surprising omission considering the evidence that links these processes to body dissatisfaction. The current studies utilized several psychophysical paradigms to measure and manipulate attentional biases towards various stimuli related and unrelated to body weight or shape. Implicit association tasks and evaluative conditioning tasks were also used to measure and manipulate implicit associations. The goal of the first two experiments was to determine whether body dissatisfaction is associated with attentional biases (1) toward human bodies but not objects, (2) toward idealized bodies and, (3) toward idealized bodies of the same gender. More specifically, Experiments 1 and 2 evaluated the allocation of visual attention in male and female undergraduate observers towards male and female bodies of varying sizes. Results from these experiments suggest that observers show a systematic attentional bias towards thin, but not fat, bodies of the same gender. This attentional bias toward thin bodies does not extend to thin objects. Furthermore, the magnitude of the attentional bias towards thin bodies of the same gender correlates positively with observers' self-reported levels of body dissatisfaction. Thus, body dissatisfaction does appear to be related to biased patterns of visual attention.

Experiment 3 utilized the Implicit Associations Test (IAT) as an implicit measure of the positively and negatively valanced associations with different body types, establishing a preliminary relationship between implicit attitudes, attentional biases, and body dissatisfaction. Experiment 4 examined the causal relationship between implicit

attitudes toward ideal body types, attentional biases towards these bodies, and body dissatisfaction to investigate the potential modifications to the TIM. Lastly, Experiment 5 examined the causal relationship between attentional biases towards body ideals and body dissatisfaction. Taken together, these conducted experiments rigorously tested the appropriateness of specific modifications to the current Tripartite Model of Body Image.

CHAPTER 2: EXAMINING BODY DISSATISFACTION AND VISUAL ATTENTIONAL BIASES

2.1 Experiment 1: Attentional Biases in Male and Female Observers

Visual attention provides insight into mental states (attitudes, beliefs, evaluations, etc) by indicating what observers find desirable or threatening in their environment (Fox, 2005). Current body image literature suggests that women frequently compare their own bodies to glamorized thin body ideals and that this perpetual comparison results in negative evaluations of one's own body (Levine et al., 2011; Trottier et al., 2007; Heinberg, 1996). As summarized above, Glauert and colleagues (2010) examined selective attention towards bodies to determine if women visually attend to thin bodies and whether this attentional bias is a function of body dissatisfaction. Using a modified dot-probe task to measure attentional biases, Glauert and her colleagues established that women in general allocate their visual attention towards thin bodies regardless of body dissatisfaction.

2.1.1 Hypothesis and Design

Experiment 1 aimed to further the work conducted by Glauert and colleagues by systematically modifying their paradigm to verify their original findings and to address new questions. The first goal of Experiment 1 was to replicate the work of Glauert and colleagues to determine whether an attentional bias towards thin bodies exists in female observers. Given the relationship between body dissatisfaction and the observation of media depictions of thin bodies (Grabe et al., 2008; Trampe et al., 2007), one might

expect a woman's level of body dissatisfaction to correlate with the magnitude of her attentional bias toward thin bodies. Yet, Glauert and colleagues (2010) did not find a significant relationship between body dissatisfaction and attentional biases toward thin bodies. Thus, a second goal of this experiment was to reassess the relationship between body dissatisfaction and attentional bias. The stimuli utilized by Glauert and colleagues were nude and contained thin female bodies that were emaciated. These stimuli are not typically seen in everyday environments. Experiment 1 used modified body stimuli that were more consistent with what one typically sees in the real world. A third goal of Experiment 1 was to determine whether men also show an attentional bias towards thin bodies, and if so, whether their bias correlates with male body dissatisfaction. Previous studies failed to include a male sample, an important omission considering that the growing incidence of body dissatisfaction amongst men (Garner, 1997). Indeed, male body dissatisfaction is associated with depression, low self-esteem (Olivardia et al., 2004), anabolic steroid abuse (McCreary et al., 2007), and extreme dieting (Blouin & Goldfield, 1995) making the study of body dissatisfaction in men necessary. Finally, Experiment 1 also investigated whether biased patterns of visual attention are specific to the perception of same gender bodies or generalize to all human bodies.

2.1.2 Methods

Participants

Thirty-nine undergraduate students (18 females) from the Rutgers-Newark campus received course credit for their participation. In this and all subsequent studies, all participants reported normal or corrected-to-normal vision, and all were naïve to the hypothesis under investigation. All of the studies in this dissertation were approved by

the Rutgers University IRB. Also, all participants provided written informed consent before initiating each study.

Apparatus

Computer generated human bodies were displayed on a Dell 24" RGB monitor set at a spatial resolution of 1920 x 1200 pixels and a temporal resolution of 60 Hz. The monitor was controlled by a Pentium D 3.00 GHz processor. The experiment was programmed using E-prime 2.0 software (Psychological Software Tools, Inc). The computer monitor was centered at participants' eye level and was positioned at a distance of approximately 46 cm from the participant. Each participant also completed the gender appropriate version of the Body Shape Questionnaire-34 (BSQ-34) (Varnado-Sulllivan et al., 2006; Cooper, 1987). The BSQ-34 is a 34 item self-report measure that assesses levels of body dissatisfaction experienced during the past several weeks. BSQ-34 scores range from 34-204 with higher scores indicating higher levels of body dissatisfaction.

Stimuli

The images of the male and female bodies were constructed using visualization software found online at www.myvirtual-model.com (see Figure 4). Realistic, full-bodied figures of a Caucasian man and a Caucasian woman with different Body Mass Indexes (BMI) were generated based on entered weight and height information. Body image height (8.5 cm or 10.4 degrees of visual angle) corresponded to an actual human bodily height held constant at 170.2 cm (5 feet, 7 inches). According to the Centers for Disease Control and Prevention (2000), the average BMIs of adult American men and women are 26.6 and 26.5 respectively. The BMI range for healthy weights is 18.5-24.9.

So to create thin bodies, the BMI of the current body stimuli was set at 18, just below the healthy weight range. This BMI of 18 kg/m^2 differed significantly from the BMI of the thin body (11.7 kg/m^2) used previously by Glauert and colleagues (2010). The larger BMI was selected for use in the current study because in the general U.S. population, BMIs less than 16 are rarely seen (Hebebrand et al., 1996). Glauert and colleagues (2010) found only a non-significant trend of a correlation between observer body dissatisfaction and attentional bias. The use of an extremely thin body may have distracted participants simply because such bodies are atypical. To avoid this, the current study used only body BMIs that fall within the range seen in typical U.S. populations. To create the heavy body images, BMI was set at 42 for men and 36 for women, values that fall in the obese range.

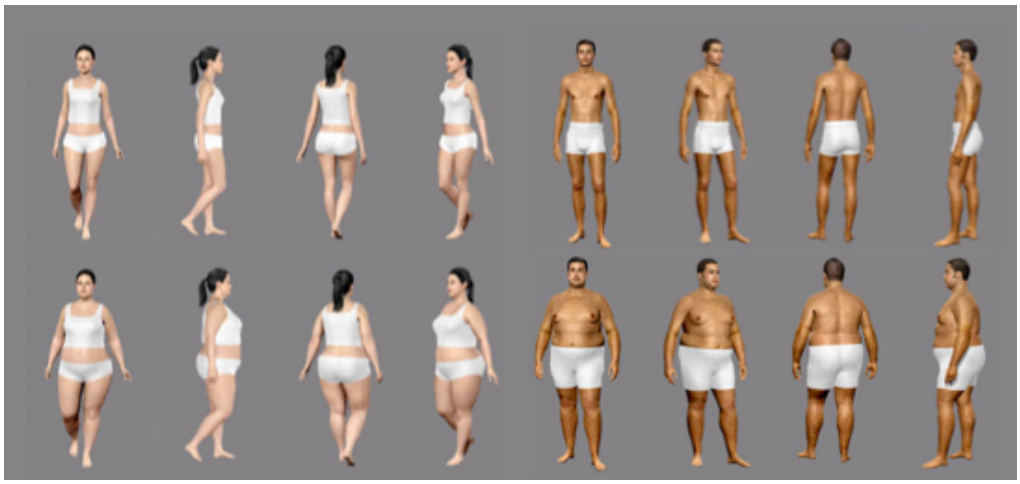

Figure 4. Male and female stimuli used in Experiment 1. Stimuli varied systematically by gender, viewpoint, and BMI.

For each condition, body postures were presented in four different viewing angles to reduce participant boredom. The four viewpoints included: frontal (0º), left (90º), back (180º), and right (270º) poses. Male figures were clothed with gray shorts and no shirt.

Female figures were clothed with white shorts and a fitted white tank top. On each trial, figures always appeared in pairs, one above the other equally distanced from the fixation point. In each pair, both figures always had the same gender and viewpoint but differed in BMI. On half of the trials the thin body appeared above the heavy body and in the other half of the trials, the reverse was true.

Stimulus Verification

To ensure that observers readily interpreted the bodies as "thin" or "fat", a preliminary study with 19 naïve participants was conducted in which participants viewed and rated the 16 different experimental figures (2 genders x 4 viewpoints x 2 BMIs) in random order. A print out of the male and female stimulus pairs was handed to each participant with the following instructions: "Rate these bodies from 1 (Skinny) to 10 (Fat) and write down your rating of each body". A paired-samples t test was conducted to evaluate whether the ratings of fat and thin bodies differed significantly. The ratings of the fat male figures (M=8.2, SD= 1.2) significantly differed from the ratings of the thin male figures (M=2.4, SD= 1.07), $t(18)=18.06$, $p<.01$. Similarly, the rating for fat female figures (M=6.3, SD=1.2) significantly differed from than the rating for the thin female figures (M=2.1, SD= 1.04), $t(18)= 12.44$, $p<.01$.

Design and Procedure

Each participant was tested individually. Before participants began any aspect of the experiment, they thoroughly read and signed the consent form and any questions or concerns that they raised were addressed. Participants first completed the gender consistent version of the Body Shape Questionnaire-34 (BSQ-34) (Varnado-Sulllivan et

al., 2006; Cooper, 1987). Participants were distanced approximately 46 cm from the monitor. The psychophysical task was initiated, first with a set of instructions presented on the computer monitor. Participants read the instructions and clicked a button when they were ready to begin the task. The instructions directed participants to focus on the fixation point (+) which was presented in the center of the screen for 1000 ms. Following the fixation point, two bodies appeared, one directly above the other equally distanced from the preexisting fixation, for 500 ms. Immediately after the 500 ms presentation of the bodies, the bodies were replaced with an otherwise blank screen containing a 1 cm arrow (facing either left or right) occupying the position of the middle, or belly button region, of one of the bodies. Participants simply reported with a button press, as quickly and accurately as possible, whether the arrow was pointed to the left or right. The arrow remained on the screen until a response was made (see Figure 5). No feedback was given.

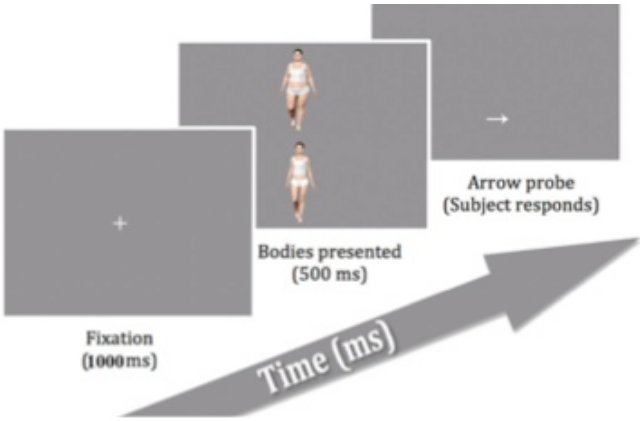

Figure 5. Depiction of an arrow-probe trial used in the current studies.

Trials were arranged in 6 blocks of 24 trials for a total of 144 trials. Each block contained only images of either male or female bodies. Blocks alternated between

genders, and were counterbalanced to ensure that an equal number of participants saw either a female or male block first. Within each block, trials were presented in random order and counterbalanced for body pose (front, back, left, and right), location of the thin body (top or bottom), arrow direction (left or right), and arrow location (top or bottom). Once each participant completed the 144 arrow-probe trials, the computer program automatically indicated to the participant that the experiment had been completed. The entire experiment required approximately 30 minutes to complete.

2.1.3 Results

Descriptive statistics are presented in Table 1. Reaction times (ms) for correct arrow direction judgments were collected across trials. Arrow direction judgments were correct on more than 95% of the trials. The mean reaction time (RT) across all trials was 557.4 ms, indicating that participants were able to perform this simple task very accurately and quickly. Raw RT differences were computed with the mean reaction time when the arrow-probe appeared where the thin body had been and the mean reaction time when the arrow probe appeared where the fat body had been located. Each participant's BMI was calculated from self-reported height and weight by taking weight in kilograms and dividing it by the square of height in meters (kg/m^2). The average male BMI was 23.8 kg/m^2 and the average BMI of the female participants was 23.6 kg/m^2. Both of these values fall well within the normal BMI range (WHO, 2004).

Subject	Measure	N	Mean	*SD*
Male	BMI	21	23.8	4.75
	BSQ-34	21	62.2	24.3
	Male Body Bias	21	.051	.175
	Female Body Bias	21	.008	.063
Female	BMI	18	23.6	4.15
	BSQ-34	18	80.1	36.1
	Male Body Bias	18	-.067	.171
	Female Body Bias	18	.068	.166

Table 1. Experiment 1. Descriptive statistics.

A repeated measures ANOVA was conducted with participant gender (Male, Female) as a between subjects factor and stimulus gender (male, female) and BMI of the probed body (thin, fat) as the within subjects factors. There was no significant main effect of participant gender, $F(1,37) = 1.956$, $p = .170$, no main effect of stimulus gender, $F(1,37) = 1.920$, $p = .174$, and no main effect of probed stimulus BMI, $F(1,37) = .284$, $p = .597$. None of the two-way interactions were significant, all $p > .05$. There was no interaction between participant gender and stimulus gender, $F(1,37) = .161$, $p = .690$. There was no interaction between participant gender and probed stimulus BMI, $F(1,37) = .551$, $p = .462$, and there was no interaction between stimulus gender and probed stimulus BMI, $F(1,37) = 2.416$, $p = .129$. However, the three-way interaction was significant, $F(1,37) = 5.995$, $p = .019$.

When female participants viewed women's bodies, reaction times for arrow direction judgments were slightly faster when the arrow appeared where the thin woman's body had been. However, post-doc t-tests indicated that this RT difference between the thin body (M=550.8, SD=107.6) and fat body (M=610.4, SD=228.3), was not

significant $t(17)= 1.716$, $p = .104$. When female observers viewed men's bodies, the difference in mean RT for the thin male body (M=646.9, SD=107.6) and fat male body (M=580.8 SD=141.9), also did not reach statistical significance $t(17)= -1.448$, $p = .166$. When men viewed pairs of thin and fat women's bodies, the RT difference between the thin female body (M=511.2, SD=148.5) and fat female body (M=517.0 SD=161.1), was not significant $t(20)= .594$, $p = .559$. Similarly, when men viewed male bodies, the RT difference between the thin male body (M=515.4, SD=177.8) and fat male body (M=549.38 SD=202.4) did not reach significance $t(20)= 1.164$, $p = .258$.

Overall, male participants had faster RTs (M=523.3) than female participants (M=597.2). Therefore, the data were reanalyzed as relative RT differences or bias scores rather than as absolute RT differences (see Figure 6). These bias scores were calculated by subtracting the mean reaction times when the arrow replaced the thin body from the mean reaction time when the arrow replaced the fat body, then dividing this number by the average of the two means. A positive attentional bias score indicates a bias towards the thin body, while a negative score indicates a bias towards the fat body. Another repeated measures ANOVA conducted on the bias scores with participant gender (Male, Female) as the between subjects factor and stimulus gender (Male, Female) as a within subjects factor found no significant main effect of participant gender, $F(1,37) = .749$ p=.392, and no main effect of stimulus gender, $F(1,37)=1.819$, p=.186. However, the interaction between stimulus gender and participant gender was significant, $F(1,37) = 6.744$, $p = .013$. These results indicate that both male (mean attentional bias score =.051, SD= .175) and female observers (mean attentional bias score =.068, SD=.166) had a tendency to direct more attention towards thin bodies (indicated by positive bias scores)

but only to thin bodies of the same gender. T-test revealed that none of these bias score were significantly different from zero (indicative of no attentional bias) for men and women, p>.05. However, there was a significant RT difference (Figure 6) for female observers in their bias scores while viewing male and female bodies, $t(17)= 2.213$, $p= .041$.

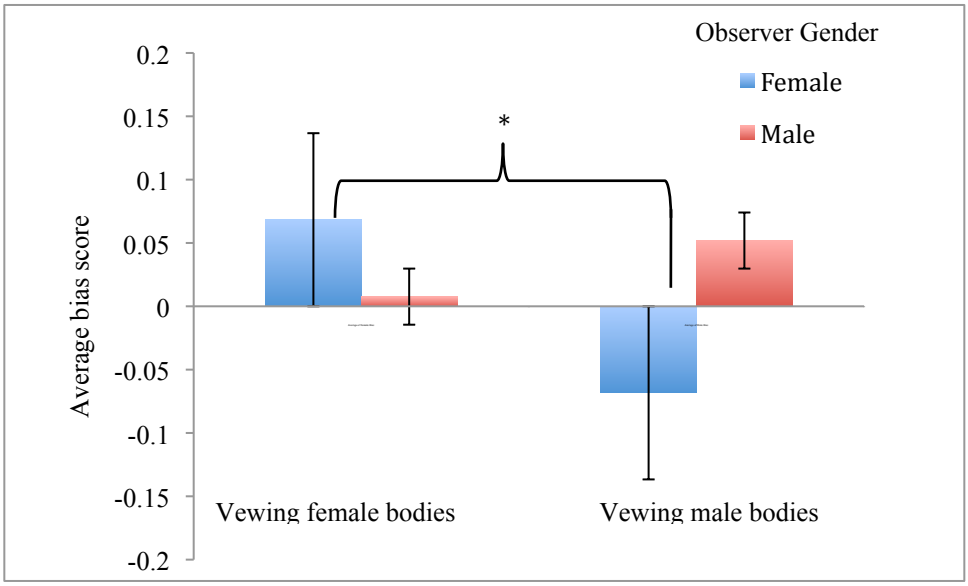

Figure 6. Results of Experiment 1: Both male and female observes show a tendency to direct their visual attention toward thin bodies of the same gender. Positive bias score indicates a bias towards thin and a negative bias score indicates a bias toward heavy.

Scores on the body dissatisfaction questionnaire (BSQ-34) ranged from 34 – 125 for men (M= 62.2, *SD*= 24.3) and from 34 – 148 for women (*M*= 80, *SD*= 36.1). A post-hoc t-test indicated that BSQ-34 scores for male and female participants differed only marginally, $t(37) = -1.83$, p=.075. Previous research indicates that BSQ scores of 80 and above indicate a high risk for the development of eating disorders (Sepulveda, Carrobles, & Gandarillas, 2008). Eight of the female participants and 5 male participants had BSQ-

scores falling within this high range. Due to the small sample size, these data were not considered separately from the data of participants falling in the low and middle ranges.

To determine whether individual differences in attentional bias might be related to observer body dissatisfaction and/or physical body size, the Pearson Product Moment Correlation was used to test for correlations between attentional bias (mean RTs and bias scores) and observer BSQ-34 and between attentional bias and observer BMI. There was no significant correlation between observers attentional bias scores for female stimuli and BSQ-34 score, r = .076, p = .645 and no significant correlation between observers attentional bias score for male stimuli and BSQ-34, r = .010, p = .954. BMI (calculated from self reported height and weight) did not correlate with male body biases, r = -.204, p = .212 or female body biases r = .140, p = .396 in all observers.

2.1.4 Discussion

The goals of this study included determining whether women and/or men demonstrate a biased allocation of visual attention toward thin bodies and if so, whether such biases occur during the perception of bodies of either gender. The final goal was to examine whether the attentional bias is related to body dissatisfaction in men and/or women.

The trends observed in Experiment 1 suggest that both male and female observers may differ in their distribution of attention across thin and heavy bodies and that attentional biases may be strongest when observers see bodies of the same gender. These findings are in line with classic theories of social comparison that posit people will compare themselves to similar others (Festinger, 1954). Therefore it would make sense that one would display greater selective attention towards bodies of the same gender

since they do this on a daily basis according to social comparison theories. Further, the trend observed in visual attention towards thin bodies of the same gender suggest this visual mechanism may be driven by upward social comparison. As past research indicates, upward social comparison may result in harmful effects to body satisfaction (Strahan et al., 2006). Considering the observed interaction between participant gender and figure gender, all subsequent experiments will match stimulus and observer gender.

This study did not find a significant correlation between body dissatisfaction and attentional bias towards thin bodies in women and men, consistent with the findings of Glauert et al. (2010). This finding is contrary to what was predicted. It was hypothesized that visual attention would be related to body dissatisfaction if visual attention were needed to directly compare one's own body to an ideal body (Smith et al., 2006; Cooper et al., 1992). It is possible that a significant correlation was not observed because attentional biases were not significantly different from zero (no attentional bias). The difference in attentional biases between the current study and Glauert and colleagues (2010) may be due to differences in body stimuli. The stimuli used by Glauert and her colleagues (2010) were nude and ranged from extremely emaciated to extremely overweight. Though the stimuli were equated on extremeness, it is feasible that the extremely emaciated body grabbed attention because it differs vastly from the typical bodies seen in one's environment. The same argument could be made for the extremely overweight body, but sadly, overweight individuals are not uncommon in the United States (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Further, our stimuli were clothed unlike the nude stimuli used in Glauert's experiment. Specifically, the female stimuli created for the current experiment were clothed in tank tops that covered the majority of the torso. This may have been an

issue considering that research conducted on bodily ideals implicates the torso as a critical region in the conception of the bodily ideal (Yarow, 2011; Crossley, Cornelissen, & Tovée, 2012). Future studies will modify stimuli to include a clearly visible torso in both men and women.

A significant relationship between body dissatisfaction and BMI was not observed in the current experiment. This might reflect the use of self-report measures of height and weight to calculate BMI. Experiment 2 will address this issue by having the experimenter measure the height and weight of each participant to compute a more accurate BMI.

Though sexuality was not measured in this experiment, it is presumed that the majority of the participants were heterosexual. This raises the question of whether sexual attraction might account for the absence of a significant attentional bias towards thin bodies of the other gender. To control for sexual attraction, an object condition will be added to Experiment 2. Objects are typically visually dissimilar to human bodies and should not be perceived by most people as sexually attractive. If this reasoning is valid, an attentional bias towards thin objects is not expected, comparable to the lack of an attentional bias towards thin opposite gendered bodies observed in the current study. The inclusion of this object condition should then rule out sexual attraction as an underlying cause of the observed patterns of visual attentional biases.

Finally, the small sample size in this experiment may account for the lack of significant findings. Experiment 2 will substantially increase the number of participants to address this issue. In all, Experiment 2 will modify the body stimuli, directly measure height and weight of participants, add an object condition, match stimulus and observer gender, and increase the sample size in attempts to elucidate the results from Experiment 1.

2.2 Experiment 2: Investigating the specificity of attentional biases towards thinness

2.2.1 Hypotheses and Design

To further investigate the relationship between body dissatisfaction and attentional biases, new stimuli were created that made the BMI differences between the thin and fat stimuli more salient. The studies conducted by Glauert and colleagues (2010) employed images of nude women. Because we did not feel it appropriate with our student body to use images of nude men and women as stimuli, the body stimuli in Experiment 1 were clothed. But maybe they were over clothed in a way that reduced the visible curvature of key body regions such as the torso. Previous research has shown that women direct their attention to the torsos of other women (Yarow, 2011). The torsos of the female stimuli were partially covered with a tank top in Experiment 1. So Experiment 2 gave the female stimuli a makeover, clothing them in bikinis that exposed more of the torso that has been documented to draw the attention of other women. Lastly, the number of participants increased in Experiment 2.

Attentional biases towards bodies were expected, because they are socially relevant cues that our visual system prioritizes (Fox, 2005). This attentional bias towards thin may be specific to only bodies that are same gendered for the purposes of social comparison. For example, a woman is most likely to compare her own body to another woman's body instead of to a man's body. The bodily comparison of opposite genders might be uncommon, or at least less common, because of the bodily structural differences between men and women. So to examine whether the lack of an observed attentional bias towards opposite gendered bodies may have been due to a difference in structural similarity, an object condition was added to Experiment 2. Buildings were used as the

object stimulus because they are so dissimilar to the human body for both men and women. Further, the inclusion of an object condition allows use to begin to answer the question of whether sexual attractiveness may have influenced attentional biases towards opposite gendered bodies. That is, maybe an attentional bias towards thin was not observed in opposite gendered bodies because both thin and fat bodies may have been perceived as attractive just because they were of the opposite gender. Again, an object should not be perceived as sexually attractive to either men or women and therefore an attentional bias towards a thin object is not expected. Determining the specificity of this attentional bias is important for understanding the extent of such biases and its actual relationship to body dissatisfaction.

2.2.2 Methods

Participants

The participants were 158 undergraduate students (69 males) from the Rutgers-Newark campus. Each received course credit for their participation.

Apparatus

Computer generated human bodies and buildings were displayed on a 21" Sceptre monitor set at a spatial resolution of 1680 x 1050 pixels and a temporal resolution of 60 Hz. The monitor was controlled by iBuyPower AMD Phenom II X4 955 3.21 GHz Processor. The experiment was programmed using E-prime 2.0 software (Psychological Software Tools, Inc). The computer monitor was centered at participants' eye level and positioned at a distance of approximately 152 cm from the participant. Distance to the monitor was fixed as participants were placed in a chin rest. The increased distance to

the monitor, relative to Experiment 1, reduced the perceived vertical extent of each body and building stimulus to 3.2° of visual angle. As before, each participant completed the gender appropriate version of the BSQ-34 questionnaire (Varnado-Sulllivan et al., 2006; Cooper, 1987).

Stimuli

There were two classes of stimuli in this experiment: bodies and buildings. New realistic full-bodied male and female figures were created with an on-line graphic visualization program (www.myvirtual-model.com) (see Figure 7). As before, a thin and a heavy version of each body were constructed. In this experiment thin and heavy male bodies were created with a BMI of 18 and 44 respectively. Recall the BMI for heavy male figures was only 42 in Experiment 1. This change in BMI further differentiated the thin and heavy male figures. The same BMIs were used to create the female stimuli as well. Male figures were clothed with shorts and no shirt and female figures wore black bikinis exposing the full torso of both male and female stimuli. Considering the inclusion of the object condition, multiple views of a building did not render visual differences. That is, the front, back, left, and right views of the building stimuli were essentially identical. So to match the body and object condition in views, only frontal views of the bodies in a neutral stance were displayed. The building stimuli were constructed to also match the vertical and horizontal extents of the human bodies in the thin and fat conditions.

As with the arrow-probe task used in Experiment 1, each trial started with a fixation point followed immediately by the simultaneous presentation of two same gender bodies or two buildings, one above the other. In each pair, one stimulus was thin and the

other was wide/fat. As in Experiment 1, after the bodies (or buildings) appeared for 500 ms, they were replaced by a blank screen with an arrow (facing left or right) positioned in the previous location of the center of one of the two figures. As before, participants indicated with a button press whether the arrow pointed to the left or right. No feedback was given. Reaction times were recorded for trials in which participants corrected reported arrow direction.

Figure 7. Body and object stimuli used in Experiment 2 depicted side by side.

Procedure

After providing written consent, each participant walked with the experimenter to a back room of the lab so that accurate height and weight measurements could be obtained. Participants then completed the gender appropriate version of the BSQ-34 (Varnado-Sulllivan et al., 2006; Cooper, 1987) or the arrow-probe task. Order of the arrow probe task and the BSQ questionnaire was counterbalanced so that potential order effects might be assessed.

Every participant completed 6 blocks of 24 trials per block (144 total trials) of the arrow-probe task. All participants completed the same-gender body trials (3 blocks) before starting the building trials (3 blocks). The entire experiment required approximately 30 minutes to complete.

2.2.3 Results

Descriptive statistics are presented in Table. 2. Attentional bias scores ((mean RT fat – mean RT thin)/average RT) were computed from mean reaction times when the arrow-probe appeared where the thin body (or object) had been and when it appeared where the fat body (or object) had been located. A 2 X 2 repeated measures ANOVA was conducted on the bias scores with participant gender (Male, Female) as the between subjects factor and stimulus type (body, object) as a within subjects factor. There was a significant main effect of participant gender, $F(1,156) = .65$, $p=.025$, and no main effect of stimulus type, $F(1,156)=1.51$, $p=.221$. None of the two-way interactions were significant, $p > .05$. Female observers displayed a significant attentional bias towards thin female bodies, $t(88)= 2.671$, $p=.009$. Male observers did not display a significant bias towards thin male bodies, $p= 0.478$. A regression analysis revealed that explicit body dissatisfaction as measured by the BSQ-34 significantly predicted bias scores in female participants, $\beta= .234$, $t(87) = 2.245$, $p=.027$ but not male participants, $\beta = .159$, $t(67) = 1.318$, $p=.192$. Neither male nor female observers displayed an attentional bias toward thin buildings ($p= 0.528$, $p= 0.747$ respectively).

Subject	Measure	N	Mean	*SD*
Male	BMI	69	26.0	5.8
	BSQ	69	71.1	29.6
	Body Bias	69	.003	.036
	Object Bias	69	.003	.033
Female	BMI	89	24.8	6.79
	BSQ	89	84.6	32.1
	Body Bias	89	.011	.038
	Object Bias	89	.001	.034

Table 2. Experiment 2. Descriptive statistics.

Scores of the body dissatisfaction questionnaire (BSQ-34) ranged from 34 – 143 for men (M= 71.1, *SD*=29.6) and from 34 – 170 for women (M= 84.6, SD= 32.1). Forty-five of the female participants and twenty-one male participants had BSQ-34 scores falling within the high-risk range (BSQ> 80) (Sepulveda et al., 2008). A post-hoc t-test indicated that females in the high BSQ-34 group displayed a significant attentional bias towards thin female bodies t(44) = 3.508, *p*=.001 A additional post-hoc t-test revealed significant gender differences in BSQ-34 scores. Female participants reported significantly more body dissatisfaction than men, t(156) = -2.70, *p*=.007. Interestingly, order effects were observed in female participants. Females who completed the BSQ-34 after the arrow probe task reported significantly less body dissatisfaction (BSQ-34 *M=72.2)* compared to females who completed the BSQ-34 before the arrow probe task (BSQ-34 *M=93.4),* F(1,87)=10.43, *p*= .002. BMI did not correlate with attentional bias scores for either bodies or objects.

2.2.4 Discussion

The results from this experiment help clarify findings from Experiment 1, specifically the lack of an attentional bias towards thin opposite gendered bodies. To elucidate this previous finding, attentional biases were examined in an object condition (buildings). Using an object stimulus offers insight into the roles that structural differences between stimuli and sexual attraction might play in attentional biases. The results of Experiment 2 suggest that participants did not selectively attend to thin objects, parallel to the lack of attentional biases observed towards opposite gendered bodies in Experiment 1. Two explanations may account for this finding and the findings from Experiment 1. First, perceived structural differences may weaken social comparison, thus eliminating or weakening attentional biases. Second, sexual attraction, including a lack thereof, towards body stimuli may also impact attentional biases (Experiment 1 and 2). Sexual attraction to stimuli was not measured in this current experiment, nor did participants see opposite gendered bodies. However, conclusions can still be made based on the current findings. One classical study found that women visually attend longer to pictures of other women bodies than to men's bodies, though sexual attraction predicts that women should attend longer to pictures of male bodies (Leckart, Keeling, & Bakan, 1966). The authors of this study predicted that men would also attend longer to pictures of female bodies because of sexual attraction but males exhibited no difference in attention duration between male and female bodies. The findings of Leckart and colleagues (1966) suggest that something else may be driving visual attention to bodies. Inline with the current studies, social comparison may indeed drive visual attention toward same gendered bodies.

In Experiment 2, a significant attentional bias towards thin was exhibited in female observers only. These results confirm the findings of Glauert et al. (2010) and suggest that stimulus differences (visible torso) as well as sample size may have contributed to the lack of a significant bias towards thin in Experiment 1. Further, order effects were observed in female observes. Women who completed the BSQ-34 after the arrow probe task reported significantly less body dissatisfaction compared to females who completed the BSQ-34 before the arrow probe task. The arrow probe task may have served as a distraction, resulting in decreased attention to body concerns. Further, the continuous presentation of thin and fat bodies and objects may have affected body dissatisfaction in a particular way, though much cannot be concluded. Considering the order effects, Experiment 3 will administer the BSQ-34 before any other psychometric task.

In Experiment 2, men displayed a pattern of attentional bias similar that of women indicated by the slightly positive bias score (attention towards thin). Though this attentional bias observed in men was not significant, it still suggest that male observers may exhibit similar attentional processes as women but maybe to a different degree. Specifically, men may exhibit a stronger attentional bias towards a male body that is more reflective of the male bodily ideal (McCreary, 2005).

A significant correlation between levels of body dissatisfaction, as measured by the BSQ-34, and attentional biases toward thin bodies was observed in female observers. This observed attentional bias did not correlate with body mass index (BMI) indicating that these attentional biases are driven by observers' feelings towards their bodies and not simply due to the difference between their body size and the perceived body size of the

stimulus. That is to say, the observed attentional biases are truly related to negative thoughts and feelings about one's body and do not simply reflect a perceptual phenomenon. This finding is important because it sheds light on the fact that body dissatisfaction entails more than just being physically bigger or smaller than an ideal, but that the subjective, experienced difference between a person and the ideal has an aversive emotional effect---body dissatisfaction.

In male observers, attentional bias scores did not correlate with body dissatisfaction or BMI. This finding again suggests that underlying mechanisms of body dissatisfaction may be different for men and women. One explanation for the lack of a significant correlation between body dissatisfaction and attentional biases in men is that men exhibited significantly lower levels of body dissatisfaction compared to women and their observed attentional bias was not significant. Gender differences on the BSQ-34 suggest that men may not have a strong aversive emotional effect as women. Further replications of this experiment are needed, modifying the measure of body dissatisfaction for male observers as well as including a lean muscular male stimulus that is reflective of the male bodily ideal.

The current findings, specifically the correlation between body dissatisfaction and attentional bias in women observers, provide preliminary evidence that there exists a meaningful relationship between attentional biases and body dissatisfaction in the TIM of body image. Experiment 3 will now provide the first set of psychometric measures used to evaluate implicit associations in the proposed modified model of body dissatisfaction.

CHAPTER 3: EXAMINING THE RELATIONSHIP BETWEEN IMPLICIT ASSOCIATIONS AND VISUAL ATTENTIONAL BIASES

Experiments 1 and 2 have preliminarily established a relationship between body dissatisfaction and visual attentional biases towards ideal bodies in women. Thus far none of the conducted studies has entailed a measure of implicit attitudes. Experiment 3 introduced the Implicit Associations Test (IAT) so as to measure implicit association towards these ideal bodies and examine the relationship between such associations, attentional biases, and body dissatisfaction. A key question will be whether implicit associations are precursors to the visual attentional biases that appear to be associated with body dissatisfaction.

3.1 Experiment 3: Implicit Associations, Attentional Biases, and Body Dissatisfaction

3.1.1 Hypothesis and Design

Are attentional biases towards idealized bodies reflective of the observer's positive associations towards these bodily ideals? Experiment 3 aimed to answer this question. Research indicates that the internalization of the thin body ideal results in positive, implicit associations towards thin bodies and negative associations towards fat bodies (Ahern & Hetherington, 2006). With some linkage between body dissatisfaction and implicit association thus established, Experiment 3 was designed to elaborate on our understanding of this linkage by investigating how body dissatisfaction and implicit

associations relate to attentional biases towards idealized bodies. Since implicit attitudes guide attentional biases, some relationship between these processes is expected (Roskos-Ewoldsen & Fazio, 1992). Experiment 3 presents the first study to utilize the IAT in an assessment of the relationship between the attentional biases, body dissatisfaction, and implicit associations.

As mentioned previously, participants who internalized the thin body ideal, a key construct of body dissatisfaction, display positive implicit associations towards thin and negative associations towards fat (Ahern & Hetherington, 2006). This finding provides support for the link between internalization and implicit attitudes (see Figure 2). The findings from this same study however found that these implicit attitudes were not enough to predict the development of body dissatisfaction, suggesting something more is needed. Biased allocations of visual attention toward idealized bodies may represent an additional source of influence between implicit attitudes and body dissatisfaction. The study described below aims to determine whether attentional biases might connect implicit attitudes and body dissatisfaction in models of body dissatisfaction development such as the TIM. It was predicted that individuals who hold positive associations towards idealized bodies will also show attentional bias towards these bodies.

3.1.2 Methods

Participants

The participants were 48 undergraduate students (23 males) from the Rutgers-Newark. Each received course credit for their participation.

Stimuli

Participants completed the same arrow-probe task on the same apparatus with the same body stimuli viewed from the same distance as in Experiment 2. They also completed the Implicit Association Test (IAT) on the same computer as the arrow-probe.

The IAT is a standardized measure of implicit associations that relies upon differences in response time latencies as an indicator of association strength (Greenwald et al., 1988). The IAT is based on the assumption that reaction times to trials that are congruent with participants' existing associations will be shorter than the reaction times of trials that are incongruent with existing associations. In the current study, the IAT was programmed using Inquisit software. The IAT displayed a set of instructions that participants read and exited when they were ready to begin the task. The IAT was used to measure the implicit associations that male and female participants have towards images of thin and fat bodies of the their own gender. The bodies used in the IAT were identical to those used in the arrow-probe task.

The IAT procedure used in Experiment 3 consisted of seven blocks of trials. In the first block, participants categorized a body as either thin or fat. During the second block, participants categorized an attribute (word stimulus) as good or bad. During the third and fourth blocks, participants categorized a body using combined labels that include both the categories (thin or fat) and attributes (good or bad). For example, thin was paired with good, and fat was paired with bad.

The fifth block repeated block 1 reversing the location of the labels (e.g., if fat was located at the top right corner in block 1, it was moved to the top left corner). The

sixth and seventh block repeated the third and fourth block, reversing the pairings. So, thin was paired with bad and fat was paired with good.

Thus, the 7 blocks of trials of the IAT can be summarized as: (1) single category practice: thin/fat, (2) single category practice: good/bad, (3) dual category critical: thin+good/fat+bad, (4) dual category critical: thin+good/fat+bad, (5) single category practice: fat/thin, (6) dual category critical: fat+good/thin+bad, (7) and dual category critical: fat+good/thin+bad (see Figure 7 and the appendix for the stimulus list). Reaction time data were collected to compute a D-score or measure of preference.

Figure 8. Depiction of sample trials in Implicit Association Task for different blocks: target practice (blocks 1 and 5), attribute practice (block 2), and dual category critical (blocks 3, 4, 6, & 7).

Design and Procedure

After each participant provided written consent, they completed the gender appropriate version of the BSQ-34 (Varnado-Sulllivan et al., 2006; Cooper, 1987). Next, the experimenter measured each participant's height and weight. All participants then completed the arrow-probe task from Experiment 2 followed by IAT task described

above. Participants were debriefed after following the IAT. The entire experiment required approximately 30 minutes to complete.

3.1.3 Results

Descriptive statistics are presented in Table 3. The average male BMI was 24.1 kg/m^2 and the average BMI of the female participants was 23.8 kg/m^2. Both of these values fall well within the normal BMI range (WHO, 2004). Scores of the body dissatisfaction questionnaire (BSQ-34) ranged from 34 – 87 for men (M= 55.5, SD=14.3) and from 42 – 115 for women (M= 77.0, SD= 21.9).

Subject	Measure	N	Mean	*SD*
Male	BMI	23	24.1	4.80
	BSQ	23	55.5	14.3
	Body Bias	23	.012	.019
	D score	23	.390	.443
Female	BMI	25	23.8	5.01
	BSQ	25	77.0	21.9
	Body Bias	25	.014	.035
	D score	25	.334	.513

Table 3. Experiment 3. Descriptive statistics.

Attentional bias scores from the arrow probe task were calculated in the same fashion as described in the previous studies. When viewing pairs of same gender bodies, bias scores suggested that male and female observers displayed an attentional bias towards thin bodies, though this bias was only significant in male observers, $t(22)= 3.13$, $p= .005$ and marginally significant for female participants, $t(24)= 1.95$, $p= .062$. For women, BMI significantly predicted visual attentional bias, $\beta= -.526$, $t(24)=-2.125$, $p=$

.045, but body dissatisfaction did not. For men, neither BMI or body dissatisfaction predicted visual attentional biases.

Following the standard protocol with IATs, a D score of effect size was computed from reaction times. To compute the D scores, a latency difference score between compatible versus incompatible trials was first tallied for practice and dual category critical blocks separately. The latency difference for these practice and dual category critical trials was then divided by the standard deviation of each block type (practice and dual category critical). This resulted in two separate D scores, one for practice trials and another for critical trials. Lastly, the overall D score was computed by adding together both D scores and divided by 2. Once the final D score is computed, a positive score is indicative of a preference towards thin and a negative D score indicative of a preference for fat.

Results from a regression analysis performed on men and women combined show that D score did not predict visual attentional biases as predicted, $\beta = .062$, $t(47)=.420$, $p=.676$. D scores however significantly predicted body dissatisfaction, $\beta = -.454$, $t(47)=-2.596$, $p= .013$. It appears that stronger implicit attitudes are related to lower levels of body dissatisfaction. Gender also significantly predicted body dissatisfaction, $\beta = -.547$, $t(47)=-4.25$, $p<.001$, males exhibiting lower levels of dissatisfaction. Finally, BMI was also significant predictor of D scores, $\beta=-.335$, $t(46)= -2.408$, $p=.020$. None of the interactions were significant, $p>.05$.

Follow-up t-test was performed to examine whether D scores differed significantly from zero (no preference). D scores for male participants ($M=.389$, $SD=$

.443) were significantly different from zero, $t(22)=4.209$, $p<.001$, indicative of an attitudinal preference for thin male bodies. Female participants also displayed a D score ($M=.334$, $SD= .513$) significantly different from zero, $t(24)=3.25$, $p=.003$, also indicative of an attitudinal preference towards the thin female bodies.

3.1.4 Discussion

It was hypothesized that a strong attitudinal preference for the thin body type would reflect a visual attentional bias towards the thin body type. Findings from this study do not support this hypothesis as implicit attitudes towards bodily ideals were not related to visual attentional biases. Though this direct relationship between implicit attitudes and visual attentional biases was not observed, the findings from Experiment 3 do suggest a strong relationship between body dissatisfaction and implicit attitudes towards varying body types. Increases in body dissatisfaction were related to decreases in positive associations to the thin body type. These results may be reflective of an ego defense mechanism, similar to that proposed by Major and Schmader (2001). This perspective suggests that individuals will engage in self-serving cognitive behaviors in order to protect ones self both individually and socially (see Jost & Banajii, 1994 for review). That is to say, weakening positive associations towards thin or strengthening positive associations towards heavy may reduce body dissatisfaction. Such defense mechanisms could present itself implicitly, as in the reduction of implicit attitudes towards ideal body types or explicitly through behavior, visually avoiding non-ideal body types. In the case of attention, research provides evidence that attention may be divided so that one stimulus is ignored while the other is attended to (Cherry & Taylor, 2005). Such an attentional mechanism can be used as a defense when a certain stimulus is

threatening to the self. The "self" that an individual is innate to protect is constantly changing and is influenced by the environment and internal states (Cooper, 1989). When threats to the self arise, whether it is a function of one's internal state (e.g., body dissatisfaction) or environmental influences (e.g., media exposure), defense mechanisms should presumably increase. The design of the current study does not allow us to make clear inferences about such mechanisms.

Speaking further on the design of the study, participants completed the BSQ-34 before the other tasks in the experiment. Completing such an explicit measure beforehand may elevate body dissatisfaction and activate these ego defense mechanisms to protect the self. That being said, if a participant reports high levels of body dissatisfaction, which is related to responses of being dissimilar to a bodily ideal; to protect the self one may implicitly activate positive associations related to them (e.g., heavy being good). The significant relationship between D score and BMI suggest that heavier persons are more likely to hold positive associations towards the fat body type. Individuals with larger BMIs are faced with the stigma of being overweight and deal with prejudices (Brownell, 2005). Completion of the BSQ-34 may have made this stigmatized group more aware of the prejudices and possible negative outcomes of having a non-idealized body and triggered self protective mechanisms such as implicitly associating heavy bodies with good (Crocker & Major, 1989; Crocker, Cornell, & Major, 1993).

Though male bodily ideals are thought to be big and muscular (McCreary et al., 2004; Hildebrandt et al., 2004; Sweeting, 2008), male observers displayed a visual bias towards thin bodies. This attentional bias supports the importance of leanness in the male body ideal (Tiggermann, Martins, & Kirkbride, 2007). The male body ideal can be

understood as more complex than the female body ideal. The female body ideal seems to vary largely on one dimension, thinness (Cafri et al., 2005). The male body ideal, on the other hand, varies along two dimensions; leanness and muscularity, resulting a variety of ideal body types ranging from lean to super muscular.

In summary, the findings from Experiments 1 through 3 are mixed but sufficiently informative to lay the foundation for Experiments 4 and 5. In Experiment 1, a trend of an attentional bias towards thin bodies was observed when women viewed female bodies and when men observed male bodies. Though these biases were not significant, the patterns of results were consistent with the work of Glauert and her colleagues (2010). Findings from Experiment 2 added additional support for an attentional bias towards thin bodies in women but not men. Experiment 2 also found a significant positive correlation between body dissatisfaction and visual attentional biases in women, but again, not in men. Given that male body ideals involve two dimensions, leanness and muscularity, it is certainly possible that the thin male bodies did not match idealized male bodies enough to trigger an attentional bias in men. Finally, the results of the current experiment suggest a strong relationship between body dissatisfaction and implicit attitudes towards body types. Interestingly, the findings of Experiment 3 raise the possibility that a protective mechanism may be involved in non-clinical, though significant, levels of body dissatisfaction. The next two experiments attempt to extend these results systematically for the purpose of determining whether the Tripartite Influence Model of body dissatisfaction (TIM) can be modified examining meaningful causal relationships between visual attentional biases, implicit attitudes, and body dissatisfaction.

CHAPTER 4: EXAMINING A MEDIATION MODEL OF BODY DISSATISFACTION

As discussed in the introduction, the Tripartite Influence Model (TIM) of Body Image (see Figure 1) (Thompson et al., 1999b; Van de Berg et al., 2002), proposes three core sources of social influence that define body image development: one's peers, parents, and media. According to the TIM, internalization and social comparison mediate the effects of family, peer, and media influences on body image distortions, and body dissatisfaction. Experiments 1-3 provide preliminary support for the modified TIM by establishing relationships between body dissatisfaction, visual attentional biases, and implicit attitudes held about bodily ideals.

Experiment 4 will test a mediation model linking implicit attitudes, body dissatisfaction and visual attentional biases. As discussed above, implicit attitudes can guide behaviors (Roskos-Ewoldsen & Fazio, 1992) including visual attention. This being said, positive implicit attitudes towards body ideals should presumably guide visual attention towards these ideal body types. Sociocultural theories of body dissatisfaction (e.g., Thompson et al., 1999) posit that we internalize societal ideals such as thin physiques are good, thus associating thin with good. If activating or strengthening such associations or attitudes about body ideals leads to visual attentional biases towards these ideals, then this would provide evidence that implicit attitudes about bodily ideals mediate visual attention.

Previous research has shown that the internalization of the thin body ideal results in positive, implicit associations towards thin bodies and negative associations towards

fat bodies (Ahern & Hetherington, 2006). The current TIM (Van de Berg et al., 2002) directly links internalization of societal ideal to body dissatisfaction. The goal of Experiment 4 is to directly test a modified TIM by investigating whether visual attentional biases mediate the linkage between internalizations of societal body ideals (implicit attitudes) and body dissatisfaction.

4.1 Experiment 4: The Effects of Evaluative Conditioning on Attentional Biases and Body Dissatisfaction: A Mediation Model of Body Dissatisfaction.

4.1.1 Hypotheses and Design

The aim of Experiment 4 is to manipulate or enhance implicit attitudes utilizing an evaluative conditioning task modeled after the work of Dijksterhuis (2004). Evaluative conditioning, essentially classical conditioning, can give rise to attitudinal changes that can be measured both implicitly and explicitly (Olson & Fazio, 2001). Empirical findings suggest that evaluative conditioning can implicitly form or enhance mental attitudes/associations (Staats & Staats, 1958; Zanna, Kiesler, & Pilkonis, 1970; Dijksterhuis, 2004). The current study expands on this phenomenon by attempting to strengthen positive implicit attitudes related to ideal and non-ideal body types for men and women.

It is predicted that evaluative conditioning with respect to body type worth will affect biases in visual attention or the type of bodies to which participants spontaneously attend. As the literature suggests, individuals should direct their attention to stimuli about which they hold implicit attitudes (Roskos-Ewoldsen & Fazio, 1992). However, it is unclear how the valance of the implicit attitude affects attention. That is to say, do

individuals attend more to positive, negative, rewarding, or threatening stimuli? The threat perception literature provides empirical evidence that individuals selectively attend to threatening stimuli (Öhman, Flykt, & Esteves, 2001; Trawalter, Todd, Baird, & Richeson, 2008; Vanessa & DeLoache, 2008; 2010). The results of Experiment 1-3 could be interpreted as suggesting that ideal bodies are threatening, thus producing the observed bias in men and women. The evaluative conditioning task will presumably activate or enhance implicit attitudes of a positive valence for the purpose of determining whether positive implicit processes mediate visual attention during body perception thus affecting body dissatisfaction.

If visual attention towards particular body types reflects observers' implicit attitudes about certain body types as good for example, then manipulations of implicit associations towards bodies should systematically alter patterns of visual attention towards those bodies. According to this prediction, training participants to associate ideal body types with positively valanced words (e.g., good, great, awesome) should enhance visual attentional biases toward ideal body types. Conversely, training individuals to associate non-ideal body types with positively valanced words should decrease attentional biases towards ideal body types. A second hypothesis is based on the assumption that most individuals already exhibit an attentional bias towards ideal bodies, presumably thin bodies for women and muscular bodies for men (e.g., Glauert et al., 2009; Cho & Lee, 2013; Experiments 1-3). Since the evaluative conditioning task is rather basic, it is not anticipated that a relatively brief manipulation will flip a potentially life long bias such that observers spontaneously direct their attention towards non-ideal

bodies. However, it is predicted that this manipulation might decrease attentional biases towards ideal body types.

Again, Experiment 4 will test the proposed mediation model. It is predicted that visual attentional biases will mediate effects of evaluative condition on body dissatisfaction by presumably strengthening positive implicit attitudes towards either the ideal or non-ideal body type that will subsequently alter attentional biases towards these body types. Previous research has shown that internalization of the thin body ideal results in positive, implicit associations towards thin bodies and negative associations towards fat bodies (Ahern & Hetherington, 2006). This research, however, did not find a relationship between implicit attitudes, as measured by the IAT, and body dissatisfaction. The current study will investigate further the predictive relationship between implicit attitudes and body dissatisfaction. Specifically, it is predicted that participants who are trained to associate ideal body types with positive words will experience greater body dissatisfaction. Conversely, participants trained to associate non-ideal body types with positive associations will experience a decrease in body dissatisfaction.

It is also important to note that race and sexual orientation may moderate the effects of evaluative conditioning. As discussed previously, the race-buffering hypothesis suggests that African American women hold larger body ideals than their Caucasian counterparts and that, as a result, African American women experience lower levels of body dissatisfaction (Sabik et al., 2010; Molloy, 1988; Wildes & Emery, 2001; Grabe & Hyde, 2006; Roberts et al., 2006; Warren et al., 2005). Other research further suggests that gay men, relative to heterosexual men, are more likely to strive for a youthful, thin body ideal (Altman, 1982; Lackoff & Scherr, 1984; Seiver, 1994). To the extent that this

is the case, gay men may exhibit weaker implicit preferences for the muscular body ideal, compared to their heterosexual male counterparts. The following experiment was conducted to test the above predictions.

4.1.2 Methods

Participants.

The participants were155 undergraduate students, 86 female (mean age 19.9, *SD*=3.0; mean BMI=23.9, *SD*=7.0) and 69 male (mean age 20.5, *SD*= 3.0, mean BMI 26.5, *SD*=5.2), from the Newark campus of Rutgers University who received partial credit towards a course requirement. All participants reported normal or corrected-to-normal vision.

Apparatus.

Newly created computer generated human bodies were displayed on a Dell 24" RGB monitor set at a spatial resolution of 1920 x 1200 pixels and a temporal resolution of 60 Hz. The monitor was controlled by a Pentium D 3.00 GHz processor. The experiment was programmed using E-prime 2.0 software (Psychological Software Tools, Inc). The computer monitor was centered at participants' eye level and was positioned at a distance of approximately 35.6 cm from the participant. All participants were positioned with a chinrest.

Each participant completed the gender appropriate version of the Body Shape Questionnaire-34 (BSQ-34) (Varnado-Sulllivan et al., 2006; Cooper, 1987) and a modified Body Parts Satisfaction Scale (BPSS-R) (Petrie, Tripp, & Harvey, 2002) to assess levels of body dissatisfaction. The modified BPSS-R consists of 14 items that measure participants' levels of satisfaction with various body parts as well as the desire to change the

muscularity, tone, and/or size of any specific body parts. Participants completed this latter measure in a private room while standing in front of a full-length body mirror so they could thoroughly examine each body part as they completed the scale. Participants were also asked to undress down to their underwear before starting this scale. Those who reported feeling uncomfortable undressing were allowed to complete the scale fully dressed. The order of administration of the BSQ-34 and BPSS-R was counter balanced across participants.

Participants also completed the State Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) and the Positive Negative Affect Schedule (PNAS) (Watson, Clark, & Tellegen, 1988). The STAI is a common measure used in clinical settings to measure state and trait anxiety. The Form Y version of this measure was used and includes 20 items that assesses trait anxiety (e.g., "I worry too much over something that really doesn't matter" and 20 items that assess state anxiety (e.g., "I am worried."). Participants rated items on a 4-point scale, from "Almost Never" to "Almost Always", with higher scores indicating greater anxiety. The PNAS is a 20-item measure that assesses positive affect and negative affect. Participants read 20 words describing different feelings and emotions and reported, on a 5-point scale ranging from "Very slightly" to "Extremely", the extent to which they felt each emotion/feeling. Higher scores on each affective scale indicate greater positive or negative affect.

Stimuli.

The previous experiments used thin and fat body stimuli for both male and female participants. However, as the literature suggests, many men are also, or are even more, concerned about musculature (e.g., Cafri, Blevins, & Thompson, 2006; Hargreaves &

Tiggemann, 2009; Hildebrandt et al., 2004). Thus, in this experiment and the subsequent one, the male body stimuli varied in muscularity and thinness. A new set of stimuli was created to include a muscular/lean body type stimulus (ideal) and a scrawny body type stimulus (non-ideal) for male participants. Further, the new body stimuli were created using exact body measurements of chest, waist, and hip measurements that reflect the ideal and non-ideal body types for men. Since the new stimuli for men were created with exact body measurements that reflect ideal and non-ideal body types of men, a new set of female stimuli was also created to consist of chest, waist, and hip measurements that reflect ideal and non-ideal body types for females.

Measurements for the ideal body type stimuli were obtained from sources describing the body measurements of typical male fitness model and female fashion models in the United States (Mathews, 2013; Ward, 2011). This approach seemed suitable since theories of body dissatisfaction are heavily based on sociocultural models. A typical female fashion model in the U.S. has a 34" bust, 24" waist, and 34" hips while, in comparison, the average American woman has 38" bust, 32" waist, and 41" hips (SizeUSA, 2009). Measurements for the non-ideal body type stimuli were computed by taking the difference between the ideal and average body types and then adding this difference to the average body type measurement. This resulted in a non-ideal female body type stimulus with the measurements of 42" bust, 40" waist, and 48" hips. The same method was used to create the ideal and non-ideal male body stimuli. The typical male fitness model has the following measurements: 45" chest, 32" waist, and 35.5" hips while the average man in the U.S has a 41" chest, 35" waist, and 41" hips (SizeUSA, 2009). Adding the difference between these two body types to the measurements of the average male body resulted in non-ideal male

body measurements of 37" chest, 38" waist, and 46.5" hips. Thus, the physical distance separating bodily averages from the ideal bodies and from the non-ideal bodies were equated. Muscularity was manipulated using 3D software as described below. Height was set to the average male and female heights in the U.S., namely 5'9" and 5'4" respectively (National Center for Health Statistics, 2008.).

The ideal and non-ideal bodies were initially created using Daz3D graphics software (Daz 3D, Inc.). Daz3D was selected because it allows for the independent manipulation of different body parameters such as muscularity, body tone, slenderness, etc. The male and female bodies were built in Daz3D from the "Michael and Victoria 5.0" body templates. The Daz3D software package includes preset models or body templates that consist of parameters that fit those of a supermodel and a muscular fitness model for females and males respectively. To create non-ideal bodies, the parameters on the default Michael and Victoria models were manipulated so that muscularity and thinness were set to zero. With the male body, these adjustments created the non-ideal scrawny male stimulus. To create the non-ideal female stimulus, an additional "fat" parameter was adjusted to create a heavier figure. Once the appropriate parameters were set appropriately, the stimuli were then exported to Maya 3D (Autodesk, Inc.) to adjust the bodies to the exact bodily measurements described above. The new bodies were then clothed in a basic black bikini and black briefs for female and male bodies respectively.

In the evaluative conditioning task (consisting of front facing bodies only), the vertical and horizontal extents of both the ideal and non-ideal female body stimuli were 20.7 degrees (13 cm) and 8.0 degrees (5 cm) of visual angle respectively. The vertical extent of both the ideal and non-ideal male body type was 22.2 degrees (14 cm). The

horizontal extents of the ideal and non-ideal male bodies were 8.8 degrees of visual angle or DVA (5.5 cm) and 7.2 DVA (4.5 cm) respectively. For the arrow-probe task, the vertical and horizontal extents of the female stimuli (frontal pose) subtended 16.0 (10 cm) and 6.4 (4 cm) DVA respectively. The horizontal extent of the ideal and non-ideal female body poses was 2.4 DVA (1.5 cm) and 3.2 DVA (2 cm) respectively. In the arrow probe task, the vertical and horizontal extents of the ideal and non-ideal male body type were 16.8 DVA (10.5 cm) and 2.0 DVA (1.25cm) respectively.

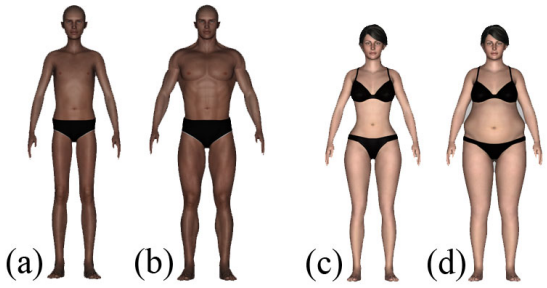

Figure 9. New body stimuli. (a) non-ideal male (b) ideal male (c) ideal female (d) non-deal female.

Procedure.

In short, this experiment began with an evaluative conditioning task that systematically altered the valence of associations that participants held towards same gender bodies. Immediately thereafter, participants completed an IAT to measure the efficacy of the conditioning. Each participant then completed an arrow probe measure of attentional allocation very similar to the arrow probe task used in the previous 3 experiments. Next, participants completed various assessments of body dissatisfaction including the BSQ-34 and the revised body parts satisfaction scale (BPSS-R). Lastly,

participants completed measures of anxiety and mood to examine whether differences in these parameters influences the effectiveness of evaluative conditioning. Each participant was tested individually. Before participants began any aspect of the experiment, they thoroughly read and signed the consent form. Also, all questions and concerns that they raised were addressed at this time.

Evaluative Conditioning Task.

The evaluative conditioning task consisted of 3 conditions: ideal positive, ideal neutral, and non-ideal positive. Participants were randomly assigned to one condition. In the ideal and non-ideal positive conditions, participants were presented with an ideal or a non-ideal body paired with positively valanced words. In the ideal neutral condition, ideal bodies were paired with neutrally valence words. Male and female participants completed the task with same gender body stimuli only.

At the start of each trial of the evaluative conditioning task, participants viewed a row of Xs (XXXXX) for 500 ms on the computer screen. The row of Xs was then replaced by a conditioned stimulus (body) that was briefly presented for 17 ms. Immediately thereafter, the unconditioned stimulus (US), a positively valenced or neutral word, appeared for 17 ms. There were 15 different positive adjective traits used for the US (repeated twice during the conditioning task) for a total of 30 trials presented randomly. A total of 15 neutral words were each presented twice in random order for a total of 30 trials. Following presentation of the US stimulus, a random letter string appeared. Participants then decided whether the random letter string began with a consonant or vowel and indicated their answer with a keyboard button press. Upon this button press, the letter string disappeared and the next trial began. Based on the experimental design and results of

Dijksterhuis (2004), the completion of 30 trials was thought to be adequate for conditioning to occur.

Body Stimulus	Word Stimuli by Condition		
Ideal Bodies	*Positive Associative Words*		
	Kind	Wonderful	Good
	Excellent	Laughter	Best
	Love	Nice	Pleasure
	Joy	Pleasant	Glorious
	Peace	Superb	Happiness
Non-Ideal Bodies	*Neutral Associative Words*		
	Tape	Stripe	Book
	Kite	Line	Forrest
	Kilt	Barn	Window
	Bike	Stereo	Door
	Shelf	Phone	Rope

Table 4. Conditions from evaluative conditioning task of Experiment 4 depicting the combinations of bodies and words displayed.

Implicit Associations Task.

Immediately after completing the evaluative conditioning task, an IAT was administered as a manipulation check to measure implicit associations towards the bodies. The same bodies used in the evaluative conditioning task were also used in the IAT. A different IAT from Experiment 3 was used in the current study. The brief version

of the IAT (IAT-B) consisting of only 5 blocks, instead of 7, was used (Sriram & Greenwald, 2009) to make sure the study required less than an hour to complete. The same body stimuli used in the arrow probe task were also used in the IAT-B. In the IAT-B, participants are asked to categorize simultaneously presented bodies and words into groups. During the IAT-B, bodies are categorized by the participant as either thin or fat in the female version, and muscular or scrawny for the male version of the IAT-B. The IAT-B D score was computed differently than the D score in Experiment 3. Only blocks 3 and 5 were used to compute D scores, as these are the compatible and incompatible bocks consisting of the combined category categorization task. Positive D score are indicative of stronger positive associations held about ideal body types.

Arrow-Probe Task

Following the IAT, participants completed the arrow-probe task to measure attentional biases. The same arrow-probe task used in the previous experiments was used in the current study. The only change was the use of the newly created male and female body stimuli. As in the previous experiments, participants viewed pairs of same gender bodies followed immediately by an arrow that replaced a previous body. Participants simply reported with a button press, as quickly and accurately as possible, whether the arrow pointed to the left or right. Response times latencies were used compute visual attentional biases. Faster reaction times when the arrow replaced a particular body type were indicative of a visual bias.

After all of the above computer tasks were completed, the experimenter measured each participant's weight and height. Participants then completed the survey packet. The

packet included demographic questions, the BSQ-34, the revised BPSS, the State Trait Anxiety Inventory (STAI), and the Positive Negative Affect Schedule (PNAS). Participants completed the survey packet in a private room and placed the completed survey in a privacy envelope that they handed to the experimenter when completed. All subjects were then debriefed. The entire experiment required approximately 60 minutes to complete.

4.1.3 Results

Participants completed the arrow probe task accurately on 97% of the trials and only RT data from correct trials were considered. Furthermore, correct trials with reaction times less than 100ms or greater than 2000 ms were also excluded (Lien, Taylor, & Ruthruff, 2013). Attentional bias scores were computed in the same manner as in previous experiments; that is, the mean RT from ideal was subtracted from the mean RT from non-ideal and this difference was divided by overall RT mean of both ideal and non-ideal reaction times. Positive scores indicate a visual attentional bias towards the ideal body type.

In the IAT-B task, D scores were computed by taking the mean corrected reaction times from block 3 and subtracting this from the mean corrected reaction time from block 5 and dividing this difference by the pooled variance. Positive D scores reflect positive implicit associations held about ideal body types. Finally, a composite dissatisfaction score was computed by reverse coding the R-BPSS and adding the standardized score of the BPSS-R and BSQ-34. This was done to create a single measure of body dissatisfaction to be added to the mediation model. A positive composite dissatisfaction score indicates higher levels of body dissatisfaction.

To analyze the relationships between the variables under consideration for inclusion in a modified TIM of body dissatisfaction, separate correlations were calculated for male and female participants (see Table 5) given the gender specific findings in Experiments 1-3. Male participants who reported greater body dissatisfaction exhibited weaker visual attentional biases towards the bodily ideal, $r(50)= -.344$, $p=.013$. Further, men with higher levels of negative affect reported higher levels of body dissatisfaction, $r(50)= .515$, $p<.001$. Lastly, men with higher levels of negative affect exhibited weaker visual attentional biases towards ideal bodies, $r(50)= -.339$, p-.014. Finally, female participants who were dissatisfied with their bodies exhibited greater negative affect, $r(64)= .410$, $p=.001$.

Subject Gender	Measure	Mean	SD	Composite Body Dissatisfaction	D score	Visual Attention Bias	Negative Affect
Males *N = 52*	Composite Body Dissatisfaction	.000	1.75	1.0	.068 (.633)	-.344* (.013)	.515** (.000)
	D score	.454	.572		1.0	-.034 (.813)	-.057 (.688)
	Visual Attentional Bias	-.004	.054			1.0	-.339* (.014)
	Negative Affect	16.8	6.13				1.0
Females *N = 68*	Composite Body Dissatisfaction	.041	1.71	1.0	-.194 (.130)	-.220 (.086)	.410** (.001)
	D score	.627	.447		1.0	-.149 (.234)	-.068 (.585)
	Visual Attentional Bias	-.004	.039			1.0	-.141 (.259)
	Negative Affect	18.3	7.93				1.0

Table 5. Variable means, standard deviations and correlations from Experiment 4. *P*-values presented in parentheses. Asterix indicate two-tailed significance levels such that: * represents $p<.05$ and ** represents $p<.01$.

Both male and female participants with high negative affect exhibited greater body dissatisfaction. Further, men with higher negative affect exhibited weaker visual attentional biases towards ideal bodies. Considering the observed relationships between negative affect and the other variables, the mediation model was analyzed controlling for negative affect following the methods outlined by Preacher and Hayes (2004). No support was found for the overall mediation model (see Figures 10, 11, and 12). Though the overall mediation model was not supported, an effect of visual attentional biases on body dissatisfaction was significant (p=.04) across genders. Further, the direct effect of condition on body dissatisfaction was significant (p= .03) for males only, indicating additional partial support of the model. Based on the findings from the correlations discussed above, it was worth investigating the relationships between the variables using regressions to examine moderations. Again, male and female participants were analyzed separately considering the gender differences found in the previous 3 experiments.

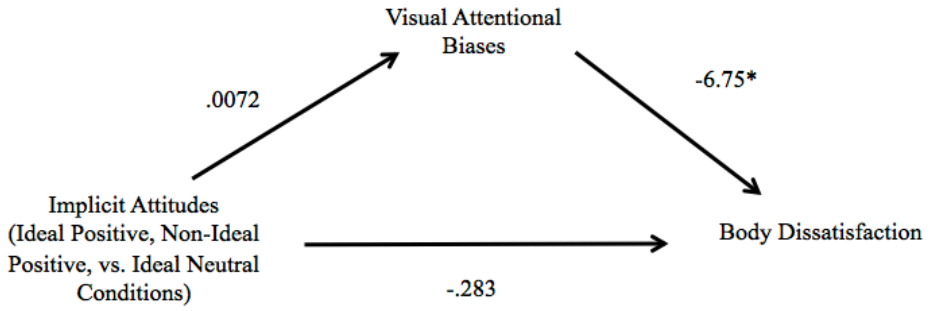

Figure 10. Mediation model, men and women combined. Evaluative conditioning conditions were dummy coded. Effect of visual attentional biases on body dissatisfaction, * p<.05.

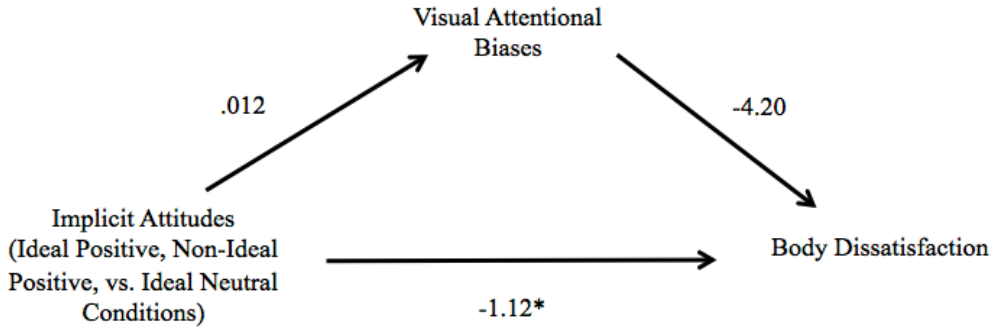

Figure 11. Male mediation model. Direct effect of condition on body dissatisfaction, * $p<.05$.

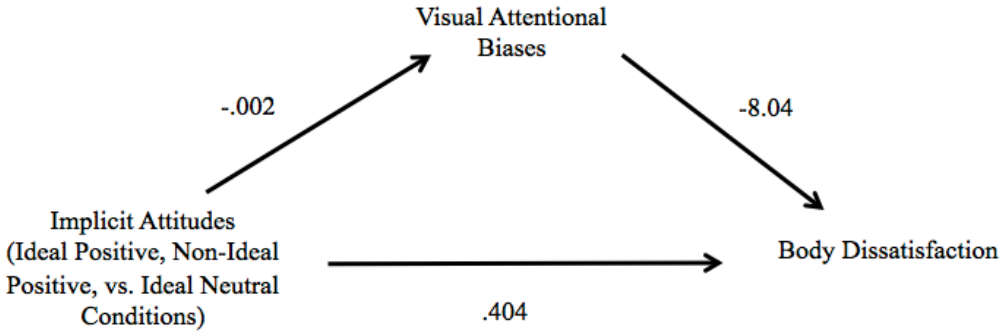

Figure 12. Female mediation model.

Women: Differences in visual attentional biases and attitudinal preferences.

A one-way ANOVA showed no significant difference in visual attentional bias across conditions, $F(2, 63)= .285$, $p=.753$ for women. Bias scores were also analyzed to determine if they were significant from zero (no bias) and they were not, $t(65)=-0.75$, $p=0.46$. To test the effectiveness of the evaluative conditioning task, a one-way ANOVA was run to compare D scores across conditions. D scores did not significantly differ

across conditions, $F(2, 63)= 0.77$, p=.469. A one-sample t-test was run to examine if D scores on the IAT task were significantly different from zero indicating no positive preference or associations. D scores ($M=0.63$, $SD= 0.45$) were significantly different from zero, $t(65)= 11.40$, $p<.001$. On average, females displayed a significant attitudinal preference towards the ideal thin female body type. This finding indicates that the IAT was sensitive enough to pick up on attitudinal biases even though the brief evaluative conditioning task may have not been robust enough to produce significant differences in implicit associations. Though the differences were not significant, the patterns of results (see Appendix 3) are consistent with some predictions since women in the ideal positive condition exhibited strongest positive associations compared to women in the ideal neutral condition and non-ideal positive condition.

Men: Differences in visual attentional biases and attitudinal preferences.

A one-way ANOVA showed no significant difference in visual attentional bias across conditions for men, F(2, 49)= 2.79, p=.071. Bias scores were also analyzed to see if they were significant from zero (no bias) and they were not, $t(51)=-0.569$, $p= 0.572$. To test the effectiveness of the evaluative conditioning task, a one-way ANOVA was run to compare D-scores across conditions. D-scores did not significantly differ across conditions, $F(2, 49)= .101$, p=.904. A one-sample t-test was run to examine if D-scores on the IAT task were significantly different from zero. D-scores ($M=0.454$, $SD= 0.572$) were significantly different from zero, $t(51)= 5.73$, $p<.001$. On average, males displayed a significant preference towards the ideal muscular male body type. Again, this finding indicates that the IAT was sensitive enough to pick up on attitudinal biases while the brief evaluative conditioning task may have not have been robust enough to produce

significant differences in implicit associations, just as observed in females. Though the differences were not significant, the patterns of results are consistent with a core hypothesis (see Table 5) in that males in the ideal positive condition exhibited the strongest positive associations compared to individuals in the ideal neutral condition and non-ideal positive condition. This, however, did not extend to visual attention.

Examining body dissatisfaction and moderating effects.

It was hypothesized that visual attentional biases would mediate the effects of implicit attitudes on body dissatisfaction. Results from mediation analyses did not support this hypothesis. Therefore, a moderation model was considered. Research suggests strong gender differences in visual attentional biases towards idealized bodies (Cho & Lee, 2013). Specifically, men high in body dissatisfaction visually attend to muscular male bodies and females high in body dissatisfaction visually attend to thin female bodies. This suggests gender differences in what the "ideal" body is which can extend to implicit attitudes (e.g., good, bad, ideal, not-ideal, etc.) held about particular body types that should differ based on participant gender. Further, considering the depression literature, females are more resistant to treatment compared to men and thus should presumably be more resistant to evaluative conditioning (Nolen-Hoeksema, 1991; 2000). If rumination about the cause and consequences of depression makes treatment of depression difficult in women, then rumination about bodily shape concerns (as measured by the BSQ-34) should make treatment of body dissatisfaction difficult as well. To examine such moderating effects, dummy variables were created for the different conditions: ideal positive coded as 1 and the other two conditions coded as 0 (non-ideal

positive and ideal neutral). The ideal positive condition was contrasted against the other two conditions based on predictions that participants in the ideal positive condition would reflect higher levels of body dissatisfaction. Gender was also dummy coded 0 and 1 for women and men respectively. Condition, gender, visual attentional bias scores (centered), and the two and three-way interactions were simultaneously entered into a regression model with composite body dissatisfaction as the outcome variable. A marginally significant effect was observed for visual attentional biases, β=-.37, *p*=.07. Decreases in visual attentional biases towards ideal bodies related to increases in body dissatisfaction. Further, the two-way condition x gender interaction significantly predicted body dissatisfaction, β=-.331, *p*=.021 (see Figure 13). Men in the non-ideal positive condition reported less body dissatisfaction compared to the other two conditions.

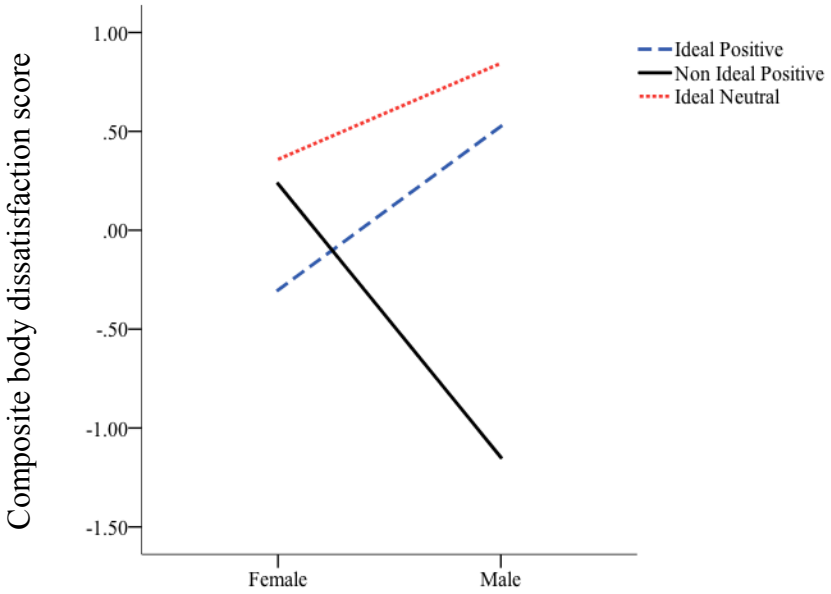

Figure 13. Two-way condition x gender interaction significantly predicted body dissatisfaction.

The same regression analysis was computed controlling for negative affect. It was appropriate to control for negative affect because it has been found to mediate disordered

eating behavior and body dissatisfaction (Heywood & McCabe, 2006). Further, as discussed above, negative affect correlated with multiple measures in men and women. Negative affect significantly predicted body dissatisfaction, β=.445, *p*<. 001. The significant condition x gender interaction became marginally significant once negative affect was controlled for, β=.249, *p*=. .064.

In men, a one-way ANOVA showed a significant difference in body dissatisfaction across conditions, $F(2, 49)= 8.56$, p=.001. A planned contrast revealed that males primed in the non-ideal positive condition reported significantly less body dissatisfaction compared to males primed in both of the ideal conditions (positive and neutral). Females did not show a significant difference in body dissatisfaction across conditions $F(2, 59)= .923$, p=.403

While an original plan was to run a sufficiently large and diverse subject pool to allow for analyses of the potential moderating effects of sexuality and race for both men and women, too few participants reported their sexuality as either homosexual or bisexual. Further, parsing the data by race did not render any significant findings, all *p*-values >.05.

4.1.4 Discussion

Experiment 4 examined whether evaluative conditioning could strengthen specific implicit associations towards ideal and non-ideal body types and subsequently impact visual attentional biases toward such bodies that would in turn mediate effects on body dissatisfaction. The overall proposed mediation model was not supported for either male or female participants. Visual attentional biases do not seem to mediate the effects of

implicit attitudes on body dissatisfaction. Overall there was a significant relationship between visual attentional biases and body dissatisfaction (p=. 036). This pattern of results suggests that stronger visual attentional biases towards ideal body types are related to lower levels of body dissatisfaction. This finding is contrary to predictions. When the regression was computed again, controlling for BMI, the significance decreased dramatically to p= .25. Correlation analysis revealed that BMI is significantly correlated to visual attentional biases $r(116)$=- .188, p<.041. Lower BMIs are associated with stronger visual attentional biases to the ideal body type that has the lower BMI in comparison to the non-ideal body type. This finding suggests that the pattern of results may be due to an effect of self-reference (Brédart et al., 2006; Tong & Nakayama, 1999). That is, participants might attend to stimuli that are more similar to them and thus presumably make them feel better about themselves, resulting in lower levels of body dissatisfaction. Females who were conditioned in the ideal positive and ideal neutral condition displayed no attentional biases. Female participants in the non-ideal positive condition; that is, who were conditioned to positively associate the non-ideal bodies with positive associations exhibited a non-significant negative bias score, indicating that they were more likely to direct their attention, spontaneously, to the non-ideal female bodies. These patterns of results suggest that positive associations affect attentional biases towards bodies in a different way then expected.

These findings are in line with the results in Experiment 3 in supporting the possible involvement of ego defense mechanisms (Major & Schmader, 2001). Again, this perspective suggests that individuals will engage in self-serving cognitive behaviors in order to protect themselves (Jost & Banajii, 1994). Attending to bodies similar to your

own can be understood as decreasing the discrepancy that would otherwise occur during bodily comparison. This may explain the lack of an attentional bias in the ideal body conditions and may further lead to the decrease in body dissatisfaction as observed in the results.

Male participants who were conditioned in either the ideal positive (Mean visual bias score= -.01) or ideal neutral (Mean bias score = -.03) condition displayed a non-significant attentional bias towards the non-ideal scrawny male body. Further, contrary to my hypothesis, males trained in non-ideal positive condition exhibited a non-significant attentional bias towards the ideal muscular male body (M= .02). These patterns of results are reverse of what was expected. During conditioning, participants were primed with both bodies and positive attributes (for only ideal positive and non-ideal positive). This priming was intended to activate or strengthen particular associations, but may have also activated ego defense mechanisms in men just as it did in women. For example, men in the ideal positive and ideal neutral conditions were being primed with a muscular male body. If these participants did not have muscular body types, (and most typical male college students do not), they may have averted their attention to attend to bodies more similar to their own in order to protect their egos. Further, males in the non-ideal condition displayed a trend of an attentional bias towards the scrawny body suggesting that the condition or priming did indeed work, but only impacted attention when not a threat to self. Attending to a scrawny body should not make one feel bad, so defense mechanisms would not be activated after priming thereby allowing attention to be modulated by the conditioning. However, there was no significant difference between

visual attentional bias scores across conditions in men, so interpretations of the pattern of results are necessarily constrained.

An interesting finding from male participants, however, was the significant difference in body dissatisfaction across conditions. Specially, men in the ideal positive and ideal neutral conditions reported significantly more body dissatisfaction compared to men in the non-ideal positive condition. This suggests that reinforcing positive associations towards body types more similar to self may decrease body dissatisfaction. The regression analysis confirmed this finding, as condition is a significant predictor of body dissatisfaction. This finding may have important implications for treatments of severe body dissatisfaction and eating disorders. That is, clinicians might decrease body dissatisfaction by having patients associate positivity with average body types or body types similar to their patient's with positivity.

Did the evaluative conditioning task employed in this experiment actually work? Some aspects of the results suggest that it did. That is to say, positive conditioning of ideal body types lead to stronger positive associations towards these ideal body types as indicated in D scores from the IAT in both men and women. Further, D scores also indicated that positive conditioning of non-ideal body types lead to a decrease in the preference for ideal bodies. But other aspects of the data are more difficult to interpret such as, for example, the insignificant difference in D score and attentional bias scores across conditions in both men and women. One possibility is that the evaluative conditioning task was too short and as a result, did not impact subsequent measures. There does not exist an extensive body of research examining the duration of evaluative conditioning effects. This is especially true for brief conditioning tasks as was employed

in this study. One classical study that examined the persistence of classically conditioned brand attitudes found that evaluative conditioning persisted for as long as three weeks after exposure (Grossman & Till, 1998). Even more impressively, Grossman and Till's conditioning task only consisted of 6 conditioning trials that paired the CS with US, a number significantly less than the 30 conditioning trials used in the current experiment.

What other factor(s) might explain why the evaluative conditioning task did not produce significant differences in IAT d-scores? One plausible factor is simply the design of the IAT. While the IAT assesses associations by measuring response times during categorization, it is also presents the body stimuli with both good and bad word labels. During the double category learning block, in which participants categorized Muscular as Good and Scrawny as Bad or Muscular as Bad and Scrawny as Good, further priming may be occurring that interferes with the prior conditioning from the evaluative conditioning task. If this is the case, then the evaluative conditioning task may have been effective, but diminished due to the IAT task that followed. The findings then might have been different if participants completed the arrow-probe task immediately after conditioning without the intermediate IAT. This may result in statistical differences in attentional biases between evaluative conditioning conditions. If this explanation is appropriate, then replications of this study should eliminate the IAT and administer the arrow-probe task immediately after conditioning. The IAT could be administered after the arrow-probe task to measure implicit associations and serve as a manipulation check of the evaluative conditioning task. However the arrow-probe task may also interfere with the IAT because it presented both ideal and non-ideal body types. Repeated exposure of both body types may again reduce the effectiveness of the evaluative

condition task. This however will not be a great concern if there is an observed difference in attentional biases between evaluative conditioning conditions.

The results from Experiment 4 lend partial support to the proposed model. Specifically for men, there is a direct relationship between implicit attitudes, through conditioning, and body dissatisfaction. The lack of a significant finding in female participants between conditioning and body dissatisfaction suggests that another mechanism may be underlying body dissatisfaction in females or that body dissatisfaction may be more difficult to treat or alter in women. The discussion chapter will speak further on this. However, it is interesting that the regression analysis revealed a marginally significant relationship between attentional biases and body dissatisfaction (p=.073). Though this relationship is in the opposite direction as predicted, it is nonetheless interesting that visual attention towards non-ideal bodies did predict greater body dissatisfaction. There are several explanations for this. One explanation as discussed earlier is the self-reference effect in which controlling for BMI eliminated this marginal effect. Another explanation is that attending to non-ideal body types may remind a person of how much they differ from the ideal thus increasing body dissatisfaction. Nonetheless, these patterns of results do suggest a relationship between attentional biases and body dissatisfaction, along with the findings from Experiments 1-3. Experiment 5 will thus attempt to experimentally manipulate visual attentional biases using an attentional training task to examine effects on body dissatisfaction in men and women.

CHAPTER 5: CAUSAL RELATIONSHIP BETWEEN ATTENTIONAL BIAS AND BODY DISSATISFACTION

The goal of Experiment 5 is to examine a causal relationship between attentional biases and body dissatisfaction. The design of this experiment was designed to experimentally answer the question raised by previous work (Glauert et al., 2010) was well as Experiments 1 and 2; that is, is there a relationship between body dissatisfaction and attentional biases? According to the current TIM (Thompson et al., 1999b; Van de Berg et al., 2002), body dissatisfaction develops directly from social comparisons. To socially compare your own body to that of others, you must visually attend to other bodies. The constant comparison between one's own body and the bodily ideal is thought to give rise to body dissatisfaction (Levine et al., 2011; Trottier et al., 2007; & Heinberg, 1996). Experiment 5 will establish whether there is indeed such a direct relationship between attentional biases towards body types and body dissatisfaction. Findings from this experiment should have important implications for treatment and preventative measures of body dissatisfaction and eating disorders.

5.1 Experiment 5: The Effects of Visual Attentional Training on Body Dissatisfaction

5.1.1 Hypotheses and Design

The aim of Experiment 5 is to manipulate or train visual attention to specific body types that may have been originally or typically evaluated as threatening and to examine the resultant effects on body dissatisfaction. This experiment is motivated by anxiety

research. Similar to the hypothesis that an attentional bias to ideal body types may maintain body dissatisfaction, anxiety research posits that attentional biases towards threats maintains anxiety (Mogg & Bradley 1998). Further, cognitive models of anxiety predict the reduction of anxiety through the elimination of these threat biases (Craske & Pontillo, 2001). Studies have utilized a modified dot-probe task, similar to the one used in the studies of this dissertation, to modify attention to eliminate biases towards threats. For example, in a study by MacLeod and colleagues (2002), non-clinical participants trained to attend to threat/negative stimuli reported higher negative moods during a stressful task compared to participants trained in neutral condition. These findings suggest that attentional biases can be manipulated as well as used to treat or reduce anxiety symptoms.

In regards to body dissatisfaction, the Stroop color-naming task has been used to evaluate attentional biases in individuals with eating disorders (e.g., Sackville et al., 1998; Lovell et al., 1997). Using the Stroop task, Cooper and collegues (1992) found, for example, that individuals with bulimia nervosa selectively attend to information related to eating, shape, and weight, stimuli that are presumably threatening to them. Further, Jansen and colleagues (2005) found that participants with eating disorders selectively attend to the parts of their bodies they subjectively evaluated as ugly. Again, these ugly body parts are presumably negative and threatening thus capturing attention.

In the current study, it was predicted that participants' attentional biases would reflect the type of attentional training they received. That is, participants trained to attend to the ideal body type should display an attentional bias towards the ideal body while participants trained to attend to the non-ideal body type should display an attentional bias

towards the non-ideal body. Further, based on findings from Glauert et al (2010) and some of the findings from Experiments 1, 2, and 3, ideal body types may capture attention because they are threatening. Thus, it is predicted that manipulating attentional biases so that participants attend more to the non-threatening stimulus, the non-ideal body type, should reduce body dissatisfaction. This ties in with social comparison theories of body dissatisfaction (Levine et al., 2011; Trottier et al., 2007; & Heinberg, 1996), that is, if a person attends to a body in order to make bodily comparisons, then smaller discrepancies between that person's body and the body they are comparing themselves to should result in less dissatisfaction. Further, attending to a non-ideal body type is downward social comparison, that is, comparing yourself to someone who is worse off than you (Pyszczynski et al., 1985). This type of comparison is self-enhancing and should thus presumably enhance body satisfaction. Based on the observed biases towards the ideal body type in the previous experiments, it appears that individuals have a tendency to make upward comparisons. So in a sense, Experiment 5 will not only attempt to modify attentional biases, but also it will attempt to modify the way in which individuals compare themselves to others. The current experiment will also examine dieting behavior to identify how this behavior influences the modification of attention towards bodies. Individuals who are currently dieting may have increased attentional biases towards the ideal body type, thus reducing the effects of attentional training and it's subsequent effects on body dissatisfaction. Findings from this study may be informative for treatment and preventative measures of body dissatisfaction and eating disorders.

5.1.2 Methods

Participants.

The participants were 64 male (mean age 22, *SD*=4.13; mean BMI 28.0, *SD*=6.2) and 82 female (mean age 22.6, *SD*=5.6; mean BMI 25.5, *SD*=6.7) undergraduate students from the Rutgers-Newark campus who registered for this study for course credit. Approximately 28.1% of men and 23.2% of women reported currently dieting.

Apparatus.

The attentional training task was programmed using E-prime 2.0 software (Psychological Software Tools, Inc.) on a Dell 24" RGB monitor set at a spatial resolution of 1920 x 1200 pixels and a temporal resolution of 60 Hz. The monitor was controlled by a Pentium D 3.00 GHz processor. The computer monitor was centered at participants' eye level and was positioned at a distance of approximately 35.6 cm from the participant. All participants were positioned relative to the monitor with a chinrest.

Procedure.

Each participant was randomly assigned to one of the attentional training conditions and tested individually. Before participants began any aspect of the experiment, they thoroughly read and signed the consent form. Any questions or concerns that they raised were addressed at this time.

Attentional training task.

The attentional training task was an arrow-probe task that was modified to resemble that previously used by Macleod and colleagues (2002) in studies of anxiety. During the current task, participants were presented simultaneously with the ideal body

stimulus and the non-ideal body stimulus (women: thin vs. fat; men: muscular vs. scrawny) in the same experimental procedure employed in the arrow-probe task from all previous experiments. The key manipulation that turned the arrow probe task from the previous experiments into a training task for the current experiment was the location of the arrow. In this experiment, unlike any of the previous experiments, the arrow always appeared in the location previously occupied by the same body type. Depending upon condition to which each participant was randomly assigned (half-ideal, half-non-ideal), participants always saw, across 576 trials, the arrow appear where the ideal body had been or where the non-ideal body had been). The goal of this manipulation was to train participants to spontaneously direct their attention to a particular body type. The bodies used in the training task are identical to the bodies used in Experiment 4.

After completing the training task, participants' height and weight were measured by the experimenter, and they completed the same package of questionnaires as in Experiments 4; demographic questionnaire, BPSS-R, BSQ-34, STAI, and PNAS. All experimentation took approximately 60 minutes to complete and participants were debriefed afterwards.

5.1.3 Results

A summary of the results can be found in appendix 4. To compare differences in body dissatisfaction across attentional training conditions, a 2 (condition: ideal or non-ideal training) X 2 (gender: male, female) X 2 (dieting: currently dieting, not currently dieting) mixed analysis of variance was performed. A significant main effect of condition was found on BPSS-R $F(1,111)=4.73$, $p=.032$. Individuals in the ideal training condition

(*M=41.3, SD=13.3)* reported significantly less body dissatisfaction as measured by the BPSS than individuals in the non-ideal training condition (*M=46.4, SD=13.4).* A significant effect was also found for gender on the BSQ, F(1,111)=11.225, *p*=.001, with women reporting more body dissatisfaction than men. Furthermore, a significant main effect of dieting was found on BSQ-34, F(1,111)=35.40, *p*=<.001 and the BPSS-R, F(1,111)=10.72, *p*=.001, dieters reporting significantly more body dissatisfaction than non dieters. No interactions were significant, all *p*-values >.05.

To examine effects of attentional training on state anxiety, a 2 X 2 (condition X gender) ANOVA was performed controlling from trait anxiety. There were no significant main effects or interactions, all *p*-values >.05.

5.1.4 Discussion

Training participants to direct their attention to a particular body type does appear to influence body dissatisfaction, though in an unexpected way. It was predicted that attentional training towards non-ideal body types, as compared to ideal body types, would lead to decreases in body dissatisfaction. Yet, the results were the opposite of this prediction as individuals in the non-ideal body training condition exhibited more body dissatisfaction compared to the ideal body training condition. However, this pattern of results is consistent with the pattern of results found in Experiment 4. The results from both of these experiments converge in suggesting that non-ideal body types may serve as a reminder of how much a person differs from their ideal. If so, this might trigger increases in body dissatisfaction. Inline with the current findings, Smeets and colleagues (2011) found that inducing visual attention toward self-defined unattractive body parts

lead to decreased body *satisfaction* in their participants. This result is consistent with the current finding that participants trained to direct their visual attention to non-ideal body type experienced increases in body dissatisfaction.

In the current study, differences in body dissatisfaction across the two conditions were observed when body dissatisfaction was measured with the BPSS-R and not when it was measured with the BSQ-34. Hopefully this occurred because the BPSS-R is a better measure of body dissatisfaction. The two measures do differ in significant ways. As noted previously, with the BPSS, participants evaluate their current feelings about each body part while looking in a mirror while with the BSQ-34, participants report feelings about their body from the past 4 weeks. The BSQ-34 can be considered more of a trait measure of body dissatisfaction the BPSS-R and thus harder to manipulate, especially with such a brief attentional training task.

The results of this experiment may have indirect implications for treatment. If attentional training is employed as part of treatment, it may be best if visual attention is modified so that participants direct more attention to average body types. While designing this experiment, it was thought that training individuals to attend to the opposite extreme of the ideal body type would produce the greatest improvements in body dissatisfaction. But the results indicate this was not the case. The mechanisms involved seem to be a bit more complicated, as attention to either ideal or non-ideal body types may have detrimental consequences to body dissatisfaction. This may also explain why there were no significant differences in anxiety between conditions. If a third condition had been added in which participants were trained to consistently attend to typical body types, then significant differences across conditions might have been found.

Unfortunately, since this experiment study did not have a repeated measures design and since baseline measurements of body dissatisfaction were not taken, we cannot be sure there were actual changes in body dissatisfaction. Future versions of this study should included baseline measurements of body dissatisfaction as well as an attentional training condition towards an average body type. Similar to anxiety treatments that train participants to attend away from anxiety provoking stimuli, attentional training for body dissatisfaction should help modify attention away from both ideal and non-ideal body types and towards average body types. While the results from this experiment were not in the predicated direction, the results do support the existence of a causal relationship between attentional biases and body dissatisfaction.

CHAPTER 6: EXPERIMENTS 1-4 SUPPLEMNTAL ANALYSES

Findings across Experiments 1-4 prove to be inconsistent concerning visual attentional biases towards thin or the ideal body type and its relationship to body dissatisfaction. In Experiment 1, a visual attentional bias towards thin was not significant in either men or women and this bias did not relate to the observers body dissatisfaction. In Experiment 2 a visual attentional bias towards thin was significant in women and did meaningfully relate to women's body dissatisfaction. That is, the more dissatisfied a woman was with her body, the greater the visual attentional bias towards thin she exhibited. Men did not display a significant bias towards thin male bodies nor did this visual attentional bias relate to men's body dissatisfaction. In Experiment 3, a visual attentional bias towards thin was not significant in women but it was significant in men. Further, body dissatisfaction and visual attentional biases were not meaningfully related to each other for either men or women. Finally, in Experiment 4, a visual attentional bias towards the ideal body type was not significant in both men and women. Further, body dissatisfaction and visual attentional biases were meaningful related only in men, but inversely. Specifically, higher levels of body dissatisfaction in males predicted weaker visual attentional biases towards the ideal body type. To reconcile the inconsistencies between these 4 experiments, supplemental analyses were conducted.

Inconsistencies in male data

A one-way ANOVA was conducted to identify subgroups based on differences in BMI, BSQ, and visual attentional biases across the 4 experiments as an attempt to clarify

the inconsistent findings. BSQ significantly differed across experiments, $F(3, 187) = 3.60$, $p = .015$. BMI also significantly differed across experiments, $F(3, 187) = 4.52$, $p = .004$. Lastly, visual attentional biases also significantly differed across experiments, $F(3, 187) = 3.32$, $p = .021$. Post hoc comparisons using Tukey HSD test indicated that BSQ scores from Experiment 3(M=54.1, SD= 11.4) significantly differed from BSQ scores from Experiment 2 (M=71.1, SD= 29.6) and Experiment 4 (M=70.7, SD= 30.0) p= .019 and .024 respectively. This difference may explain why a visual attentional bias towards thin was significant in men in Experiment 3, but not in Experiment 2 or 4. Men who exhibit low levels of body dissatisfaction, or who are content with their bodies may attend to thin bodies more because they are less threatening. Further, post hoc comparisons reveal that the BMI of males in Experiment 3 (M=22.9, SD= 4.47) was significantly lower than the BMI of men in Experiment 2 (M=26.0, SD= 5.8) and 4 (M=26.5, SD= 5.16), p= .027 and .008 respectively. These findings suggest that males in Experiment 3 were physically similar to the ideal body type presented in the arrow-probe task. This being the case, in regards to the ego defense mechanism hypothesized from the results in Experiments 3 and 4, males who are content with their bodies and look similar to the bodies in their environment attended to such bodies since they presumably do not pose a threat to the self.

Only in Experiment 4 was a meaningful relationship between body dissatisfaction and visual attentional biases was observed in men. Experiment 4 was the first experiment to utilized muscular male bodies as an ideal to address the complexity of the male bodily ideal that dimensions are orthogonal varying along muscularity and thinness. Higher levels of body dissatisfaction in men predicted weaker visual attentional biases towards

the muscular bodily ideal. The average BMI of males in Experiment 4 fell into the pre-obese category (BMI= 25.00 - 29.99), so these males differed drastically from the ideal male stimulus presented in the arrow-probe task. Again, considering the defense mechanism hypothesis, males attended less to these ideal bodies to protect the self.

Inconsistencies in female data

An identical one-way ANOVA was conducted with the female data and visual attentional biases towards thin bodies significantly differed across conditions. Post hoc comparisons using Tukey HSD test reveal that attentional biases in Experiment 1 (M=. 07, SD= .166) was significantly different from Experiment 2 (M= .011, SD= .038, p=.002), Experiment 3 (M=. 009, SD= .035, p=.031), and Experiment 4 (M=. 003, SD= .044, p<.001). Surprisingly, though an attentional bias towards thin was greatest in Experiment 1, this bias was not statistically significant. Visual attentional biases were only significant in Experiment 2 and a meaningful relationship between visual attentional biases and body dissatisfaction was observed. Experiment 2 had the largest sample size suggesting the difference between experiments is due to the power of the effect. Further, to elaborate more on why the bias towards thin may have been strongest in Experiment 1 may be due to the stimulus used. Experiment 1 used body stimuli that covered the majority of the torso region. The fact that the torso was covered may have made the stimulus less threatening to female observers thus allowing them to attend to the stimulus with less negative affects to self or body satisfaction. Once the stimuli was changed in subsequent experiments, exposing the torso completely, visual attentional biases towards thin decreased in comparison to Experiment 1. Again, this is further evidence that some type of defense mechanism may be underlying visual attentional biases towards other

bodies in one's environment. In Experiments 2-4, the torso (a critical region) is exposed making the stimulus more threatening to the self in regards to upward social comparison. Women who visually compare themselves to another female body that is thinner than they are may experience negative effects to body satisfaction and self-esteem. Therefore, to protect the self, female participants appear to attend less to the thin female stimulus in these experiments.

These supplementary analyses attempt to reconcile the inconsistencies throughout the experiments in this dissertation. These analyses further provide more support for the ego defense mechanism that may underlie the visual attentional biases observed in these Experiments. That is to say, the more threatening a body stimulus is to the self, the less likely one is to visually attend to such bodily stimuli.

CHAPTER 7: GENERAL DISCUSSION

The experiments in this dissertation examined the contributions of visual attentional biases and implicit attitudes to the current Tripartite Influence Model of body dissatisfaction (TIM). Findings across the five psychophysical experiments lend support to the hypothesis that biases in visual attention do meaningfully contribute to the maintenance of body dissatisfaction, though this relationship is more complex than originally conceived. Further, the results of Experiments 3 and 4 preliminarily support meaningful relationships between implicit attitudes towards specific body types and both visual attentional biases and body dissatisfaction. Finally, Experiment 5 utilized an attentional training task to measure direct, causal effects of visual attentional training on body dissatisfaction, providing strong implications for treatment of body dissatisfaction and eating disorders.

The overall goal of the studies conducted in this dissertation was to re-examine the TIM. Experiment 4 directly tested an expanded version of TIM (Figure 2) that included visual attentional biases and implicit attitudes as potential new components. Results from this experiment provided partial support for the expanded model. Though the overall revised model was not supported, the observed relationships nonetheless implicated meaningful relationships between visual attentional biases, implicit attitudes, and body dissatisfaction in a manner consistent with previous research (e.g., Smith et al., 2006; Cooper et al., 1992; Ahern & Hetherington, 2006).

7.1 A Visual Attentional Bias to the Thin and Muscular Bodily Ideal

Motivation for Experiments 1 and 2 stemmed from earlier work conducted by Glauert and her colleagues (2010) in which a general visual attentional bias towards thin bodies was found in all female observers. The observed attentional bias towards thin bodies was significantly negatively correlated with body dissatisfaction, though this relationship disappeared when BMI was controlled for. Further, their findings also indicated that increased levels of body dissatisfaction and BMI in women were related to decrements in visual attentional bias towards thin female bodies. This inverse correlation appears to be consistent with the proposed defense mechanism to protect self-esteem hypothesized in Experiment 3 and 4. In the end, Glauert and her colleagues (2010) concluded that biases in visual attentional toward thin bodies were not meaningfully related to body dissatisfaction. The experiments for this dissertation were designed to address, in part, the concern that the use of the extremely thin and overweight bodies in the studies by Glauert and colleagues (2010) might have contributed to their observed patterns. Specifically, was their general attentional bias towards thin female bodies simply due to the extreme emaciation of their body stimuli? Additionally, though both thin and overweight bodies were equated on extremeness, in today's Western society an overweight body is more common than an emaciated body thus making the emaciated body presumably more attention grabbing. Finally, the stimuli used in the studies by Glauert and colleagues (2010) depicted nude bodies, which rendered them even more atypical and thus making it difficult to disentangle the driving mechanism underlying the observed attentional bias towards thin. Experiments 1 and 2 attempted to address these issues while answering an additional question, specifically; do men also show this

attentional bias towards thin bodies? It was important to examine this relationship in men as well since they too experience body dissatisfaction (McCabe & Ricciardelli, 2004).

The results from Experiment 1 indicate that both men and women displayed an attentional bias towards thin bodies. However, these biases were not statistically significant and did not correlate with body dissatisfaction. While Glauert and colleagues (2010) found that women show a significant attentional bias towards the bodies of other thin women, only a non-significant trend in that direction was found in the current study. Stimulus differences (e.g., nudity, extreme depictions of thinness and heaviness) may account for lack of a significant attentional bias in the current study. This issue was addressed with a specific change in the visibility of the body stimuli in Experiment 2. Furthermore, the absence of significant relationships between body dissatisfaction and BMI might have reflected the use of self-report measures of height and weight to calculate BMI. Experiment 2 addressed this issue by having the experimenter measure the height and weight of each participant, though this still did not yield a significant relationship between body dissatisfaction and BMI. This last point is important because it supports the idea that body dissatisfaction is based on subjective, rather than realistic, impressions of one's own body.

In Experiment 1, the attentional bias towards thin bodies depended on whether the observer and the observed body stimuli were of the same gender. Attentional biases were most evident with same gender pairs. Therefore, in all subsequent experiments, participants only saw bodies of the same gender as themselves. Though sexuality was not measured in either Experiment 1 or 2, it is presumed that the majority of the participants were heterosexual. This raised the question of whether sexual attraction, *per se*, might have

accounted for the reduction of the attentional bias towards thin bodies of the other gender. To control for sexual attraction, an object condition was added to Experiment 2. Clearly, buildings are visually dissimilar to human bodies and are typically not perceived by most people as sexually attractive. It was reasoned that if attentional biases toward thin buildings, like attentional biases towards thin opposite gender people, were not found, then one could more confidentially conclude that sexual attractiveness was not the underlying cause. This would provide further support for the idea that biases in visual attention towards thin bodies may be specific to bodies that are similar to the observer. Such a finding would fall in line with classic theories of social comparison that posit that individuals compare themselves to similar others (Festinger, 1954). Since gender is a fundamentally important feature of human bodies, observers should be more likely to compare themselves to same gender others than to bodies of the opposite gender. Indeed, few people presumably strive to attain the body of the opposite gender. If so, then comparing oneself to a body of the opposite gender would typically not be useful. Therefore, attentional biases towards subcategories of bodies of the opposite gender would not be predicted.

However, the role of attraction is still unclear. A potentially important pitfall of the experiments conducted in this dissertation is that stimulus attractiveness and preferred mate body type preferences were not measured. The lack of an attentional bias toward bodies of the opposite gender may be due to the fact that both thin and heavy stimuli were equally attractive to the observer. Much cannot be concluded since attraction was not measured. Future studies should include measures that examine the role attraction in visual biases towards bodies.

7.2 A Meaningful Relationship Between Implicit Attitudes, Visual Attentional Biases, and Body Dissatisfaction.

Experiment 2 was the first study to report a significant attentional bias toward thin bodies by female observers as well as a significant correlation between female observers' levels of body dissatisfaction and their attentional biases towards thin women's bodies. Neither the attentional bias nor the correlation between attentional bias and body dissatisfaction was found in men. The significant attentional bias in women in Experiment 2, but not Experiment 1, may be due to the marked increase in sample size in Experiment 2 as well as the exposure of the torso region in the female body stimuli. Exposing the torso may have been a vital revision to Experiment 2 because the torso has been shown to be a critical region in the conception of the bodily ideal (Crossley, Cornelissen, & Tovée, 2012). Further, the insignificant attentional bias towards thin observed in men may point to a more complex bodily ideal for men. That is, the male body ideal varies along two dimensions, muscularity and leanness (e.g., McCreary et al., 2004; McCreary et al., 2005; & McCreary et al., 2007). Experiments 4 and 5 addressed this issue by using stimuli that were more reflective of the complex male body ideal, a lean and muscular body.

The results of Experiment 2, unlike the results of Glauert and colleagues (2010), also indicated a significant positive relationship between body dissatisfaction and visual attentional biases towards thin female bodies in female participants. The current finding may have differed from previous work because the bodies in Experiment 2 were less extreme and thus more consistent with the types of bodies that most people frequently observe in their natural environment. The findings from Experiment 2 support the

hypothesis that visual attention mediates the cognitive processes that underlie body dissatisfaction because visual attention is needed to directly compare one's own body with another's body, at least for women (Smith et al., 2006; Cooper et al., 1992).

Men, unlike women, did not demonstrate a significant relationship between attentional biases and body dissatisfaction. Again, this may have been due to the fact that men's bodily ideals are not simply thin—they are also muscular. Further, men in Experiments 1 and 2 reported significantly less body dissatisfaction than women as measured by the BSQ-34. This observed gender difference in body dissatisfaction may gain clarity with a look into gender differences in depression. Women are thought to experience greater levels of depression in comparison to men because they ruminate on their symptoms as well as the causes and consequences of these symptoms (Nolen-Hoeksema, 1991; 2000). The BSQ-34 is designed to measure individuals' thoughts and feelings about their bodies. It is entirely possible that women scored significantly higher on the BSQ-34 because they spend more time ruminating about their bodies and their body dissatisfaction. In fact, one item on the BSQ-34 specifically asks responders if they "brood" about their body. Since men are thought to ruminate less than women, this might help to account for at least some of the gender differences on scores on the BSQ-34. Accordingly, in an attempt to reduce such gender differences, an alternative measure of body dissatisfaction was used in Experiments 4 and 5. The Body Parts Satisfaction Scale, or BPSS-R, simply asked participants to report their level of satisfaction with individual body parts and their overall body. No significant gender differences were observed on BPSS-R scores in Experiments 4 and 5 thus implicating an emotional cognitive component as a potential differentiator of male and female body dissatisfaction.

Experiments 1-2 provided preliminary evidence that attentional biases towards the thin bodies of other people meaningfully correlates with the observer's level of dissatisfaction with her own body. Experiments 3 further examined attentional biases toward thin bodies in the context of implicit attitudes that observers hold about ideal and non-ideal body types. Interestingly, and in a kind of contradiction with what was predicted, increases in body dissatisfaction correlated with decreases in positive associations with the thin body type. This finding may reflect an ego defense mechanism, similar to that proposed by Major and Schmader (2001) that posits that individuals will engage in self-serving cognitive behaviors in order to protect their self-esteem (see Jost & Banajii, 1994 for review). In other words, the more a woman is dissatisfied with her own body, the more she might try to devalue societally driven messages such as "thin is good." If so, then weakening positive associations towards thin bodies or strengthening positive associations towards heavy bodies may reduce body dissatisfaction. Such defense mechanisms could present itself implicitly, as in the reduction of implicit attitudes towards ideal body types as observed in Experiments 3 and 4. Further, such ego defense mechanism can be manifested explicitly through behavior such as visually avoiding non-ideal body types that may remind an individual of one's "self" that may fall short of the bodily ideal. The "self" that an individual is innate to protect is not static and is constantly changing being influenced by either the environment that surrounds them and/or internal states (Cooper, 1989). When threats to the self arise, whether it is a function of one's internal state (e.g., body dissatisfaction) or environmental influences (e.g., media exposure), defense mechanisms should presumably increase. For example, many women explicitly avoid television shows and glamour magazine because such

media evoke negative feelings towards the self. Further, women also explicitly verbalize that thin is bad and not attractive. Such explicit behaviors may work in harmony with implicit processes as a defense mechanism to protect the self.

Experiment 3 provided preliminary evidence of a relationship between body dissatisfaction and implicit attitudes held towards ideal and non-ideal body types. Experiment 4 extended these findings by systematically assessing whether the Tripartite Influence Model (Figure 1) of body dissatisfaction (TIM) could be improved with the addition of causal relationships between visual attentional biases, implicit attitudes, and body dissatisfaction (Figure 2). Experiment 4 also included a revised male stimulus that better reflected the male ideal (muscular-lean) and non-ideal (scrawny) body types.

The proposed mediation model (Figure 2) was partially supported by the results of Experiment 4. In this study, evaluative conditioning, essentially classical conditioning, was used to manipulate or enhance implicit attitudes related to ideal and non-ideal body types for men and women (Staats & Staats, 1958; Zanna, Kiesler, & Pilkonis, 1970; Dijksterhuis, 2004). Specifically for men, conditioning unveiled a direct relationship between implicit attitudes and body dissatisfaction. Men in the ideal positive condition reported significantly more body dissatisfaction compared to men in the non-ideal positive condition. This finding implies that reinforcing positive associations towards body types more similar to self may decrease body dissatisfaction. This conclusion was confirmed by the regression analysis that found that condition was a significant predictor of body dissatisfaction. Previous research provides additional support for the conclusion that subjective positive evaluation of one's own body leads to the largest decreases in body dissatisfaction (Luethcke, McDaniel, & Becker, 2011). This certainly parallels the

finding in male participants in Experiment 4 in which positive associations towards non-ideal body types, presumably more reflective of the observers own body type, resulted in decreases in body dissatisfaction.

In Experiment 4, conditioning did not impact levels of body dissatisfaction in female participants. This raises the possibility that another mechanism may underlie body dissatisfaction in females or that body dissatisfaction may be more difficult to treat or alter in women. As discussed earlier in this chapter, women may exhibit the propensity to ruminate about their body dissatisfaction. If this is the case, then body dissatisfaction may be harder to alleviate in women, compared to men, just as rumination differences make depression harder to treat in women compared to men (Nolen-Hoeksema, 1991; 2000). Further, social comparison may have moderated the effects of evaluative conditioning on visual attentional biases and body dissatisfaction. Research indicates that higher levels of social comparison are related to higher levels of body dissatisfaction and higher levels of visual attentional biases (Blechert, Nickert, Caffier, & Tuschen-Caffier, 2009; Leahey, Crowther, & Ciesla, 2011). A limitation of Experiment 4 as well as all the experiments in this dissertation is that social comparison was not measured. A relationship, consistent with previous research, might have been observed between the extent of social comparison and body dissatisfaction and attentional biases. That is, stronger levels of social comparison may have resulted in greater body dissatisfaction and attentional biases or a reduction in treatment effects (i.e., effects of evaluative conditioning). Taken together, Experiments 1-4 implicate implicit attitudes and attentional biases as underling mechanisms of body dissatisfaction; thus motivating future studies as discussed below.

7.3 Implications of Visual Attentional Training

Experiment 5 was design to systemically determine the direct effects of attentional biases on body dissatisfaction. As mentioned in the previous chapter, the design of this experiment was motivated by anxiety research. Comparable to the hypothesis that an attentional bias to ideal body types may maintain body dissatisfaction, anxiety research posits that attentional biases towards threats maintains anxiety (Mogg & Bradley, 1998). Additionally, models of anxiety predict the reduction of anxiety symptomology through the elimination of threat biases (Craske & Pontillo, 2001).

The results from Experiment 5 paint a potentially counter-intuitive picture; namely, that training participants to attend to non-ideal bodies can produce increases in body dissatisfaction compared to training with ideal bodies. It maybe the case that non-ideal body types serve as a reminder of how much a person differs from their ideal. If this is indeed the case, this could trigger increases in body dissatisfaction. Inline with the current findings, Smeets and colleagues (2011) found that inducing visual attention toward self-defined unattractive body parts lead to increased body dissatisfaction in their participants. Further, training participants to focus on self-defined attractive body parts lead to decreased body dissatisfaction. As mentioned previously, baseline measurements of body dissatisfaction were not taken, thus it is difficult to determine the exact direction of change. Nonetheless, it is clear that attentional training produced changes in reported levels of body dissatisfaction. These findings thus provide strong support for the use of attentional training in conjunction with treatment as a potential means of ameliorating body dissatisfaction and disordered eating symptomology. Future replications of this

experiment should include longer training periods as well as baseline measurements of body dissatisfaction.

7.4 Implications, Future Directions, and Conclusion

Findings from the five psychophysical experiments discussed in this dissertation have strong implications for treatment and prevention of body dissatisfaction and eating disorders. When the results of all five experiments are considered together, it is clear that there exists a relationship between visual attentional biases, implicit attitudes towards ideal and non-ideal bodies, and body dissatisfaction in a non-clinical sample. Future studies should include a clinical sample. It is hypothesized that the effects observed in a typical sample should presumably be exasperated in a clinical sample. However, the treatment effects observed in Experiment 5 may be less effective in individuals with clinical levels of body dissatisfaction. If so, then attentional training paradigms such as the one used in Experiment 5 may be most useful as preventative measures. Again, further modified replications of Experiment 5 are needed to examine the true effects of attentional training on body dissatisfaction in both clinical and non-clinical samples.

The primary paradigm used to examine visual attentional biases in the current studies was a modified dot-probe task. Better techniques, such as eye tracking, are available currently to assess visual attentional biases. The use of eye-tracking in future studies would help to answer many of the currently unanswered questions. For example, do participants automatically fixate on a specific body type that grabs attention? In other words, are the effects described in the current studies reflective of attentional biases toward idealized bodies, away from non-idealized bodies, or some combination of the two? Answering this question would get to the root of the bottom-up processes of

attention that are occurring. Further, it also remains to be determined whether the current results are a function of difficulties disengaging attention. If the factor of disengagement or aversion plays a role, then what is the top-down processes mediating visual attention? For example, are ideal or non-ideal body types threatening or rewarding? Lastly, an eye-tracker can determine exact locations on the body that observers observer attend to, identifying critical bodily regions.

The studies in this dissertation focused heavily on the global processing of bodies. Future experiments should examine local visual processing of bodies in line with previous research (e.g., Jansen et al., 2005; Hildebrandt et al., 2012). In conjunction with eye-tracking procedures, it would be interesting to examine attentional biases to specific body parts on one's own body relative to other people's bodies as in the study by Jansen and colleagues (2005). For example, it would be worth investigating whether attentional training would be more effective in a non-clinical sample if participants were trained to attend to pictures of their own body and/or trained to attend to specific body parts (and if so, which ones). On the other hand, clinical treatment of body image involving mirror exposure attempts to disrupt negative affective responses by encouraging global processing of one's body (e.g., Hildebrandt et al., 2012). So it may be the case that focused study of global or wholistic body processing is the best route to pursue for the amelioration of body dissatisfaction and eating disorder symptomology as was done across the 5 experiments in this dissertation. However, a study systematically examining differences in the global and local processing of ideal, non-ideal, one's own, and other bodies across variations in observers' levels of body dissatisfaction would be informative.

It was an early aim of this research project to investigate the moderating effects of sexuality and ethnicity. However, the relatively small sample sizes across the experiments did not allow for meaningful analyses. It is hoped that future experiments conducted with substantially greater sample sizes would produce subgroups large enough to support meaningful cross-group comparisons. Development represents another critically important area for future research. As mentioned in the introductory chapter of this dissertation, body dissatisfaction seems to appear at a very young ages in both boys and girls (Bartlett et al., 2005; Dittmar et al., 2006). Future studies are needed to pinpoint the stage in development or the critical point in one's life when body dissatisfaction and visual attentional biases appear and shift. A longitudinal study is needed to address this question.

In conclusion, it is evident that body dissatisfaction is an issue for both men and women in today's Western society that merits great attention. Strides are being made to better understand the mechanisms underlying body dissatisfaction in the hope of constructing new and between treatments and preventions. This dissertation took on the task of attempting to modify the current gold standard model of body dissatisfaction development, the Tripartite Influence Model, to better understand the mechanisms underlying body dissatisfaction. Findings from these studies implicate important relationships between visual attention, implicit attitudes, and body dissatisfaction. An overarching goal of this body of research is that it will motivate future studies employing more rigorous empirical techniques to examine the complexities of body dissatisfaction and its underlying mechanisms.

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Appendix 1.

Experiment 3: Sequence of IAT trials and stimuli list.

Sequence	Block 1	Block 2		Block 3	Block 4	Block 5	Block 6	Block 7
Task	Target practice	Attribute practice		Dual category critical	Dual category critical	Target practice	Dual category critical	Dual category critical
Labels	Thin /Fat	Good/Bad		Thin/Fat Good/Bad	Thin/Fat Good/Bad	Fat/Thin	Fat/Good Thin/Bad	Fat/Good Thin/Bad
Stimuli	Pictures of thin and fat bodies	*Good Attributes:* Marvelous Superb Pleasure Beautiful Joyful Glorious Lovely Wonderful	*Bad Attributes:* Tragic Horrible Agony Painful Terrible Awful Humiliate Nasty	Pictures of thin and fat bodies		Pictures of thin and fat bodies	Pictures of thin and fat bodies	

Appendix 2.

Experiment 4: Sequence of IAT trials and stimuli list.

Sequence	Block 1	Block 2	Block 3	Block 4	Block 5
Task	Target discrimination	Attribute discrimination	Dual category	Reverse target discrimination	Dual category Reversed
Labels	Female IAT: Thin/Fat Male IAT: Muscular/ Scrawny	Good/Bad	Female IAT: Thin/Fat Good/Bad Male IAT: Muscular/Scrawny Good/Bad	Female IAT: Thin/Fat Male IAT: Muscular/Scrawny	Female IAT: Thin/Fat Good/Bad Male IAT: Muscular/Scrawny Good/Bad
Stimuli	Female IAT: Pictures of thin and female bodies fat bodies Male IAT: Pictures of muscular or scrawny bodies	***Good Attributes:*** Marvelous Superb Pleasure Beautiful Joyful Glorious Lovely Wonderful ***Bad Attributes:*** Tragic Horrible Agony Painful Terrible Awful Humiliate Nasty	Female IAT: Pictures of thin and female bodies fat bodies Male IAT: Pictures of muscular or scrawny bodies	Female IAT: Pictures of thin and female bodies fat bodies Male IAT: Pictures of muscular or scrawny bodies	Female IAT: Pictures of thin and female bodies fat bodies Male IAT: Pictures of muscular or scrawny bodies

Appendix 3.

Experiment 4: Descriptive Statistics of the Results

Subject	Condition	Measure	N	Mean	*SD*
Male	Ideal Positive	D score	19	0.50	0.48
		Visual Attentional Bias Score	19	-0.01	0.04
		Composite Body Dissatisfaction	19	0.53	1.70
	Non Ideal Positive	D score	19	0.45	0.66
		Visual Attentional Bias Score	19	0.02	0.05
		Composite Body Dissatisfaction	19	-1.15	1.09
	Ideal Neutral	D score	14	0.40	0.60
		Visual Attentional Bias Score	14	-0.03	0.07
		Composite Body Dissatisfaction	14	0.84	1.80
Female	Ideal Positive	D score	28	0.69	0.43
		Visual Attentional Bias Score	28	0.00	0.04
		Composite Body Dissatisfaction	26	-0.30	1.63
	Non Ideal Positive	D score	20	0.53	0.40
		Visual Attentional Bias Score	20	-0.01	0.04
		Composite Body Dissatisfaction	20	0.23	2.00
	Ideal Neutral	D score	18	0.64	0.52
		Visual Attentional Bias Score	18	0.00	0.04
		Composite Body Dissatisfaction	16	0.36	1.44

Appendix 4.

Experiment 5: Descriptive Statistics of the Results

Condition	Gender	Measure	N	Mean	SD
Ideal Training	Male	Negative	28	13.42	3.78
		State	28	44.82	4.04
		Age	27	21.88	4.73
		BMI	28	28.46	6.99
		BSQ	28	72.67	35.16
		BPSS	28	38.75	13.25
		Composite	28	-0.77	1.87
	Female	Negative	30	20.4	9.75
		State	30	45.1	5.23
		Age	30	21.4	4.67
		BMI	30	25.13	6.66
		BSQ	30	95.9	38.88
		BPSS	30	43.8	13.10
		Composite	30	0.27	1.89
Non Ideal Training	Male	Negative	32	13.97	3.03
		State	32	45.63	6.62
		Age	32	22.0	3.90
		BMI	32	27.83	5.86
		BSQ	32	79.59	25.21
		BPSS	32	45.06	12.77
		Composite	32	-0.11	1.38
	Female	Negative	31	17.77	7.68
		State	31	42.42	5.99
		Age	30	23.73	5.91
		BMI	31	25.63	5.84
		BSQ	31	99.48	35.57
		BPSS	31	47.74	14.18
		Composite	31	0.66	1.84

Appendix 5.

Demographic questionnaire used in Experiments 4 and 5.

DEMOGRAPHICS

Your responses are confidential so please be as honest as possible. DO NOT WRITE YOUR NAME ON THIS QUESTIONNAIRE.

I. Background Information

1. Sex: _____ Male _____Female 2. Age: _____

3. Current Academic Status: ___Freshman ___Sophomore ___Junior ___Senior ___5th

4. Race/Ethnicity: _____Caucasian/White _____Hispanic/Mexican American
_____African-American/Black _____American Indian
_____Asian American/Pacific Islander _____Other
(Specify: _____)

II. Weight History/Measurements

5. Present height: _____ feet _____ inches

6. Chest: _____ inches Waist: _____ inches Hips: _____ inches

7. Present weight: _____pounds

a. Length of time at current weight: _____ (months)

8. Ideal weight: _____ pounds

9. My body frame is: _____Small _____Medium _____Large

10. Are you satisfied with your current weight? ____ Yes ____ No

a. If NO, do you consider yourself to be: ____ overweight ____ underweight

11. a. Lowest weight in past 2 years:_____pounds

b. Highest weight in past 2 years:_____pounds

12. Have you experienced significant weight fluctuations (changes of more than 10% of your

body weight) in the last 12 months? _____ Yes _____ No

If yes, please explain:

_____

_____

_____

13. Are you currently dieting? ____ Yes ____ No

14. Do you work out? ____ Yes ____ No *How often?* ***Circle one:*** Never Seldom Sometimes Often

V Sexual Orientation

15. Please choose which best describes you:

____Bisexual ____Heterosexual

____Gay/Lesbian ____Prefer Not to Say

Appendix 6: Body Shape Questionaire-34 (Female and Male Version).

BSQ- F

We would like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all of the questions.
OVER THE PAST *FOUR* WEEKS:

	Never	Rarely	Sometimes	Often	Very Often	Always
1. Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2. Have you been so worried about your shape that you have been feeling you ought to diet?	1	2	3	4	5	6
3. Have you thought that your thighs, hips or bottom are too large for the rest of you?	1	2	3	4	5	6
4. Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5. Have you worried about your flesh being not firm enough?	1	2	3	4	5	6
6. Has feeling full (e.g. after eating a large meal) made you feel fat?	1	2	3	4	5	6
7. Have you felt so bad about your shape that you have cried?	1	2	3	4	5	6
8. Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
9. Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6
10. Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
11. Has eating even a small amount of food made you feel fat?.	1	2	3	4	5	6
12. Have you noticed the shape of other women and felt that your own shape compared unfavorably?	1	2	3	4	5	6
13. Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?	1	2	3	4	5	6
14. Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
16. Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
17. Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
18. Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?	1	2	3	4	5	6
19. Have you felt excessively large and rounded?	1	2	3	4	5	6
20. Have you felt ashamed of your body?	1	2	3	4	5	6
21. Has worry about your shape made you diet?	1	2	3	4	5	6
22. Have you felt happiest about your shape when your stomach has been empty (e.g. in the morning)?	1	2	3	4	5	6
23. Have you thought that you are in the shape you are because you lack self-control?	1	2	3	4	5	6
24. Have you worried about other people seeing rolls of fat around your waist or stomach?	1	2	3	4	5	6
25. Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
26. Have you vomited in order to feel thinner?	1	2	3	4	5	6
27. When in company have you worried about taking up too much room (e.g. sitting on a sofa, or a bus seat)?	1	2	3	4	5	6
28. Have you worried about your flesh being dimply?	1	2	3	4	5	6
29. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?	1	2	3	4	5	6
30. Have you pinched areas of your body to see how much fat there is?	1	2	3	4	5	6
31. Have you avoided situations where people could see your body (.e.g.communal changing rooms or swimming baths)?	1	2	3	4	5	6
32. Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
33. Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
34. Has worry about shape made you feel you ought to exercise?	1	2	3	4	5	6

BSQ-M

We would like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all of the questions.
OVER THE PAST *FOUR* WEEKS:

	Never	Rarely	Sometimes	Often	Very Often	Always
1. Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2. Have you been so worried about your shape that you have been feeling you ought to diet?	1	2	3	4	5	6
3. Have you thought that your stomach or waist are too large for the rest of you?	1	2	3	4	5	6
4. Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5. Have you worried about your flesh being not firm enough?	1	2	3	4	5	6
6. Has feeling full (e.g. after eating a large meal) made you feel fat?	1	2	3	4	5	6
7. Have you felt so bad about your shape that you have become upset?	1	2	3	4	5	6
8. Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
9. Has being with well-built men made you feel self-conscious about your shape?	1	2	3	4	5	6
10. Have you worried about your stomach spreading out when sitting down?	1	2	3	4	5	6
11. Has eating even a small amount of food made you feel fat?.	1	2	3	4	5	6
12. Have you noticed the shape of other men and felt that your own shape compared unfavorably?	1	2	3	4	5	6
13. Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?	1	2	3	4	5	6
14. Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
16. Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
17. Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
18. Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?	1	2	3	4	5	6
19. Have you felt excessively large and rounded?	1	2	3	4	5	6
20. Have you felt ashamed of your body?	1	2	3	4	5	6
21. Has worry about your shape made you diet?	1	2	3	4	5	6
22. Have you felt happiest about your shape when your stomach has been empty (e.g. in the morning)?	1	2	3	4	5	6
23. Have you thought that you are in the shape you are because you lack self-control?	1	2	3	4	5	6
24. Have you worried about other people seeing rolls of fat around your waist or stomach?	1	2	3	4	5	6
25. Have you felt that it is not fair that other men are fitter or thinner than you?	1	2	3	4	5	6
26. Have you vomited in order to feel thinner?	1	2	3	4	5	6
27. When in company have you worried about taking up too much room (e.g. sitting on a sofa, or a bus seat)?	1	2	3	4	5	6
28. Have you worried about your flesh being dimply?	1	2	3	4	5	6
29. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?	1	2	3	4	5	6
30. Have you pinched areas of your body to see how much fat there is?	1	2	3	4	5	6
31. Have you avoided situations where people could see your body (.e.g.communal changing rooms or swimming baths)?	1	2	3	4	5	6
32. Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
33. Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
34. Has worry about shape made you feel you ought to exercise?	1	2	3	4	5	6

Appendix 7.

Body Parts Satisfaction Scale- Revised.

Subject ID: ___________

BODY PARTS SATISFACTION SCALE-Revised (BPSS-R)

Instructions: For each of the body parts listed below, indicate your current level of satisfaction and the changes you would like to make if any. There is no right or wrong answers and your responses are confidential. Please respond honestly based on how you currently feel. Please look in the mirror while completing this scale, attending to the specific body parts addressed in each item.

	To respond Circle #							Desired Change (√ response)		
1. Body Weight	Extremely Dissatisfied					Extremely Satisfied		Increase	Decrease	No Change
	1	2	3	4	5	6				
								Amount: _____ pounds		
2. Body Height	Extremely Dissatisfied					Extremely Satisfied		Increase	Decrease	No Change
	1	2	3	4	5	6				
								Amount: _____ inches		
3. Shoulders	Extremely Dissatisfied					Extremely Satisfied		Increase	Decrease	No Change
	1	2	3	4	5	6	Muscularity			
							Tone			
							Size			
4. Arms	Extremely Dissatisfied					Extremely Satisfied		Increase	Decrease	No Change
	1	2	3	4	5	6	Muscularity			
							Tone			
							Size			
5. Breasts or Chest	Extremely Dissatisfied					Extremely Satisfied		Increase	Decrease	No Change
	1	2	3	4	5	6	Muscularity			
							Tone			
							Size			
6. Stomach	Extremely Dissatisfied					Extremely Satisfied		Increase	Decrease	No Change
	1	2	3	4	5	6	Muscularity			
							Tone			
							Size			

								Desired Change (√ response)		
7. Back	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6		**Increase**	**Decrease**	**No Change**
							Muscularity			
							Tone			
							Size			
8. Buttocks	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6		**Increase**	**Decrease**	**No Change**
							Muscularity			
							Tone			
							Size			
9. Hips	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6		**Increase**	**Decrease**	**No Change**
							Muscularity			
							Tone			
							Size			
10. Upper Thighs	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6		**Increase**	**Decrease**	**No Change**
							Muscularity			
							Tone			
							Size			
11. Lower Legs	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6		**Increase**	**Decrease**	**No Change**
							Muscularity			
							Tone			
							Size			
12. Body Leanness	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6	Overall	**Increase**	**Decrease**	**No Change**
13. Body muscle tone/ definition	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6	Overall	**Increase**	**Decrease**	**No Change**
14. Body size and shape	Extremely Dissatisfied 1	2	3	4	5	Extremely Satisfied 6	Overall	**Increase**	**Decrease**	**No Change**

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Appendix 8.

The Strait-Trait Anxiety Inventory.

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Appendix 9. The Positive and Negative Affect Schedule (PANAS).

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)

PANAS Questionnaire

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. **Indicate to what extent you feel this way right now, that is, at the present moment *OR* indicate the extent you have felt this way over the past week (circle the instructions you followed when taking this measure)**

1	2	3	4	5
Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely

_____ 1. Interested	_____ 11. Irritable
_____ 2. Distressed	_____ 12. Alert
_____ 3. Excited	_____ 13. Ashamed
_____ 4. Upset	_____ 14. Inspired
_____ 5. Strong	_____ 15. Nervous
_____ 6. Guilty	_____ 16. Determined
_____ 7. Scared	_____ 17. Attentive
_____ 8. Hostile	_____ 18. Jittery
_____ 9. Enthusiastic	_____ 19. Active
_____ 10. Proud	_____ 20. Afraid

CURRICULUM VITAE

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