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The Effects Upward and Downward Comparison on a Subsequent Emotion Recognition Task

Kim D. Thomas
Cleveland State University

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THE EFFECTS OF UPWARD AND DOWNWARD COMPARISON ON A
SUBSEQUENT EMOTION RECOGNITION TASK

KIM D. THOMAS

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University of Akron

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This Thesis has been approved
For the Department of PSYCHOLOGY
And the College of Graduate Studies by

Thesis Chairperson, Conor T. M^cLennan

Department & Date

Methodologist and Committee Member, Lisa Doane

Department & Date

Committee Member, Steve Slane

Department & Date

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ABSTRACT

Social Comparison Theory explains how viewing images can affect body satisfaction with two processes: upward and downward comparison. Upward comparison, which is defined as comparing oneself to a more attractive person, can result in depression and body dissatisfaction. Downward comparison, which is defined as comparing oneself to a less attractive person, can increase mood and body satisfaction. Previous research has shown that individuals with eating disorders, such as anorexia, have a deficit in emotion recognition due to their high levels of body dissatisfaction. Building upon this finding, the current study was designed to examine the effect that priming normal individuals (i.e., those without an eating disorder) with pictures depicting thin women will have on these individuals' performance on an emotion recognition task. The current study included three priming groups: thin ideal prime, overweight prime, and a control prime. Exposure to images of thin women was expected to increase body dissatisfaction, whereas exposure to overweight images was expected to increase body satisfaction. After priming, all participants performed an emotion recognition task. Participants viewed a series of faces on a computer screen and chose one of four emotions (happy, sad, surprise, or anger) to describe the face. Based on previous findings, I hypothesized that the individuals primed with the thin images would take longer to respond and be less accurate, when recognizing the emotions than both the control and overweight prime. Results indicated that exposure to thin media images did not

negatively affect emotion recognition performance. Yet, participants in the overweight prime group were significantly faster when recognizing emotions than both the control and thin ideal prime group.

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CHAPTER I

INTRODUCTION

The mass media promotes a thin ideal that is impossible for most to accomplish and can cause serious consequences, through a process known as social comparison. According to Social Comparison Theory (Festinger, 1954), individuals evaluate themselves through comparisons with others. Upward comparison occurs when an individual compares himself or herself to someone more attractive and can lead to body dissatisfaction (Bessenoff, 2006), which is very similar to what occurs when a woman sees a beautiful model in a fashion magazine (see Lopez-Guimera, Levine, Sanchez-Carracedo, & Fauquet, 2010). Downward comparison occurs when an individual compares himself or herself to someone less attractive and can increase mood and body satisfaction (van den Berg & Thompson, 2007).

Extreme body dissatisfaction is a core feature of eating disorder symptomology (American Psychiatric Association, 2000). Ridout, Thom, and Wallis (2010) found that high levels of body dissatisfaction resulted in an inability to correctly classify emotions, especially the emotion anger. Additionally, body dissatisfaction is correlated with an inability to recognize one's own emotions (Legenbauer, Vocks, & Ruddel, 2008). Many

studies have found that individuals with anorexia nervosa (AN) take longer to respond, and are more likely to misclassify the emotions expressed in faces, when compared to controls (Harrison, Sullivan, Tchanturia & Treasure, 2009; Kucharska-Pietura, Nikolaou, Malask & Treasure, 2004; Zonnevijlle-Bendek, van Goozen, Cohen-Kettenis, van Elburg, & van England, 2002). Additionally, individuals with non-clinical eating disorders have been found to have difficulty recognizing emotions (Jones, Harmer, Cowen, & Cooper, 2008; Pringle, Harmer & Cooper, 2009; Ridout et al., 2010).

The current study was designed to examine the effects of viewing images depicting different sized women on an emotion recognition task. I hypothesized that the women primed by a thin ideal, which is a form of upward comparison, would take longer to respond to the emotions than both an overweight prime and a control (neutral) prime, because body dissatisfaction is expected to increase in participants primed by a thin ideal. Moreover, the thin ideal prime is expected to produce the slowest reaction times (RTs) in the anger condition because body dissatisfaction has been found to significantly predict the recognition of anger (Ridout et al., 2010). Because, the thin ideal prime group is expected to experience the most body dissatisfaction, it is expected that the thin ideal prime group will exhibit the longest RTs in the anger condition. One aim of the current study was to examine the negative effects of viewing images of the thin ideal on healthy individuals. Additionally, I hypothesized that women in the overweight prime, which is a form of downward comparison, would respond faster than the thin ideal prime. Moreover, the overweight prime is expected to have the fastest RTs overall in the happy condition because viewing images of overweight women is expected to increase mood and body satisfaction (van den Berg & Thompson, 2007). Furthermore, the mood

congruency hypothesis (Bower, 1981) states that individuals who are happy will be able to recognize happy faces more easily.

In the current study I extend previous work, which has found that eating disordered patients have a deficit in emotion recognition, by priming healthy participants prior to an emotion recognition task. To the best of my knowledge, this was the first study to prime participants with images prior to an emotion recognition task. The current study may simulate the negative effects of viewing images of very thin women on the social interactions of many young girls and women, because emotions are a basic component of such interactions (Kessler, Schwarze, Filipic, Traue, & Wietersheim, 2006). Ridout et al. (2010) split participants into two groups based on their Eating Disorder Inventory (EDI-2) (Garner, Olmstead, & Polivy, 1983) score (those who scored low and those who scored high). Additionally, they utilized video clips to measure emotion recognition. The current study presented photos of faces to participants and instructed them to correctly identify the emotion. Jones et al. (2008) also split participants into two groups (those who scored high and those who scored low) based on their score on the Eating Attitudes Test (EAT-26) (Garner, Olmstead, Bohr, & Garfinkel, 1982). Another novel aspect of the current study is the addition of an overweight prime prior to an emotion recognition task.

If viewing images of very thin women can induce a deficit in emotion recognition, then it is possible that a large number of women experience emotional deficits in their lives, as a result of the large number of thin images present in the media. However, if downward comparison produces a positive effect, it may be beneficial for advertisements to use overweight models, as using these images would be a form of downward

comparison. Viewing overweight models may increase the ability of many young girls and women to accurately recognize the emotions of others, which may benefit the social lives of many young girls and women. Yet, this would only be possible if these women and girls were engaged in downward comparison when viewing the images. It is also possible that viewing overweight models could have the same negative effects as viewing images of the thin ideal (Bessenoff, 2006; Utter, Neumark-Sztainer, Wall & Story, 2003), if downward comparison was not occurring.

CHAPTER II

LITERATURE REVIEW

2.1 Social Comparison Theory

Viewing images of thin women can lead to body dissatisfaction, which can lead to a tendency to engage in unhealthy behaviors to control weight. Festinger (1954) developed a theory that may explain why women may engage in unhealthy behaviors after viewing thin images. Social comparison theory states that individuals are motivated to understand how well they are doing in life (Festinger, 1954). To do so, they compare themselves to others using upward or downward comparison (Festinger, 1954). Upward comparison occurs when an individual compares himself or herself to someone more attractive and is believed to lower self-esteem (Festinger, 1954). Upward comparison occurs when a woman views a fashion magazine, because the images often represent an ideal, which is impossible to achieve. Downward comparison occurs when an individual compares himself or herself to someone who is less attractive, and is believed to increase self-esteem (Festinger, 1954).

There are negative consequences to social comparison. Bessenoff (2006) found that exposing women to thin images resulted in body dissatisfaction, depression, and

lower self-esteem. She also found that those individuals with the highest levels of body dissatisfaction at the beginning of the study were more likely to engage in social comparison, which in turn led to the negative consequences (Bessenoff, 2006). Additionally, women with a diagnosable eating disorder engage in social comparison more often than women without an eating disorder (Corning, Krumm, & Smitham, 2006). It appears that eating disordered individuals may be predisposed to the negative effects of thin images.

On the other hand, viewing images of very thin women can lead to eating disordered behaviors. If a person compares himself or herself to a very thin image, and finds a large discrepancy, the individual may engage in activities to reduce the discrepancy (Festinger, 1954). With regard to eating disorders, individuals may begin to vomit, use laxatives, or starve themselves to lessen the discrepancy. One study found that girls who frequently read fashion magazines, were six times more likely than girls who did not read as many magazines to engage in unhealthy behaviors to control weight, such as diet pills and vomiting (Utter et al., 2003).

Yet, it does not appear that women automatically compare themselves to images of the thin ideal. Tiggemann, Polivy, and Hargreaves (2009) found that when participants were instructed to engage in social comparison, mood decreased and body dissatisfaction increased after viewing images of the thin ideal. Yet, when participants were instructed to imagine being the woman in the image, their body dissatisfaction did not increase, and their mood actually increased. The authors concluded that the thin image could have a positive or a negative effect, depending on how the image is processed. Furthermore, the

authors suggest asking questions to ensure participants are engaging in social comparison (Tiggemann et al., 2009).

Van den Berg and Thompson (2007) placed participants in one of three groups (upward comparison, downward comparison, or control). They found that those in the downward comparison group (those exposed to unattractive images of full body shots and faces) experienced an increase in body satisfaction and mood. Despite finding no difference between the upward comparison (those exposed to attractive images of full body shots and faces) and control condition (those shown no images) in terms of body dissatisfaction, body dissatisfaction was increased in the upward comparison group when compared to the downward comparison group. The authors suggest that overall body dissatisfaction may have moderated this relationship; nevertheless, they decided against surveying this issue because it may have primed the participants; that is, caused the participants to think about their bodies. Ideally, the images would cause participants to think about their bodies. Therefore, the authors suggest asking about overall body dissatisfaction in such a way as to not bias the results of the study (van den Berg & Thompson, 2007).

Anschutz, Engels, Becker, and Strien (2009) compared the effects of viewing thin models and average-sized models in commercials. Interestingly, they found that women felt worse after viewing the average models. Additionally, participants were allowed to eat as much food as they wanted during the study. It was found that participants ate more after viewing the thin models. Furthermore, no difference in body dissatisfaction was found, which, according to the authors was found because the participants were not paying attention to the models and were actually paying attention to the products being

sold. It was suggested that static images should be used in future studies, to ensure that participants are paying attention to the models. Additionally, this previous study utilized average sized women, not overweight women. Viewing overweight women may have changed the results. The researchers believed that the participants compared themselves to the average sized models, and felt as if their own bodies were too close in size, which caused the negative mood. Because these participants had a negative view of becoming overweight, they felt afraid and ate less. Therefore, it is possible that larger models could produce a positive effect, because participants will not feel as if the models are close to their own body size (Anschutz et al., 2009).

It has also been found that upward comparison does not only occur when viewing models, but also occurs when comparing oneself to a thin peer. Lin and Kulik (2002) found that body dissatisfaction could be significantly increased when a woman compares herself to a thin peer. However, when the women in this study compared themselves to a less attractive peer, their body satisfaction did not increase. The authors suggest that body satisfaction did not increase because the overweight peers were actually not heavy enough to produce a positive effect. Therefore, they suggest future research utilizing extremely overweight images, which would increase the discrepancy in body size between participants and the images. If this discrepancy is large enough, an increase in mood following comparison should be detected (Lin & Kulik, 2002).

2.2 Emotion Recognition

Emotion recognition can be defined as the ability to identify emotions when viewing a variety of stimuli, such as faces, music, objects, and stories (Mayer, Caruso, & Salovey, 1999). Very few emotion recognition studies have been performed on healthy

individuals (Schmid & Mast, 2010). However, a mood congruency hypothesis is generally accepted (Bower, 1981). According to this hypothesis, an individual who is happy would perform exceptionally well when classifying happy faces. Furthermore, a person who is currently feeling sad will perform exceptionally well when classifying sad faces (Bower, 1981).

Schmid and Mast (2010) examined the effect of priming a happy or a sad mood on an emotion recognition task. They primed happiness with a scene from 'Harry Met Sally,' and primed sadness with a scene from 'The Champ.' Additionally, when participants were completing the emotion recognition task, they listened to either happy or sad music. The researchers utilized an emotion recognition task that contained faces featuring happiness and sadness. They found that participants who were primed to feel sad recognized sad faces better than happy faces. Despite the fact that participants in the happy condition were unable to correctly identify more happy faces, they correctly recognized less sad faces than the control condition. The authors concluded that individuals have difficulty recognizing emotions when the emotion is not in line with how they currently feel (Schmid & Mast, 2010).

Positive emotions such as happiness are recognized faster than negative emotions (see Feyereisen, Malet, & Martin, 1986; Leppanen & Hietanen, 2003). Leppanen and Hietanen (2003) exposed participants to either a pleasant or an unpleasant smell while they performed an emotion recognition task. The task contained only two emotions (disgust and happy). In another experiment, they added a control group that was not exposed to an odor while performing the emotion recognition task, which now contained three choices (happy, neutral, or disgust). They found that when exposed to a pleasant

odor, RTs were faster for the happy faces. However, RTs were not faster for the disgusted faces when exposed to the unpleasant odor. The authors concluded that contextual factors effect how individuals perceive emotions (Leppanen & Hietanen, 2003).

Happy faces in particular are recognized more accurately and more quickly than other emotions. This is known as the happy face advantage (Kirita & Endo, 1995). Feyereisen et al. (1986) found that participants had an advantage when classifying words as happy when compared to classifying words as sad. They also utilized an emotion recognition task and found that happy faces were classified faster than sad faces. Kirita and Endo (1986) examined whether a specific feature of happy faces, such as the smile could be the reason for the advantage. They found that a specific feature did not cause the advantage, as when faces were inverted, sad faces were recognized faster. Additionally, it was found that when the face was presented in such a way that participants used holistic processing (upright), a happy face advantage was found. Furthermore, when a face was presented in such a way that participants utilized analytical processing (inverted), the happy face advantage disappeared (Kirita & Endo, 1995).

2.3 Emotion Recognition and Eating Disorders

It has been recognized that individuals with AN have issues with emotion recognition (Harrison et al., 2009; Kucharska-Pietura et al., 2004; Zonnevillle-Bendek et al., 2002). Furthermore, individuals with AN have difficulty recognizing emotions when viewing faces and hearing sentences (Kucharska-Pietura et al., 2004). Nine emotions (interest, happiness, surprise, sadness, disgust, contempt, anger, shame, and fear) and a neutral condition were each presented on a computer screen for 10 seconds for the facial recognition condition. Five sentences were each presented in one of six emotions (happy,

sad, fear, anger, surprise, and disgust) and in a neutral tone for the voice condition. Participants were required to identify the emotion being expressed. Individuals with AN performed worse than controls, especially on the emotions sadness and fear (Kucharska-Pietura et al., 2004). Adolescent ANs also showed a deficit in emotion recognition (Zonnevjlle-Bendek et al., 2002). In this study, participants were shown a face for two seconds and given six seconds to respond. AN individuals misclassified significantly more faces than the healthy controls. Moreover, no difference was found between the groups in the ability to recognize neutral faces, which the authors believe is evidence of a deficit that is emotional in nature, as opposed to a general cognitive deficit due to starvation (Zonnevjlle-Bendek et al., 2002).

Harrison et al. (2009) tested participants' ability to guess an emotion from viewing a set of 36 eyes on a computer screen, which is known as the Reading the Mind in the Eyes Task (RME) (Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001). The AN individuals gave significantly more wrong answers than controls. Additionally, using a self-report measure, AN individuals reported more difficulty in regulating emotions than the control group (Harrison et al., 2009). It was also found that ANs made more errors when viewing neutral, sad, and disgusted faces (Pollatos, Herbert, Schandry & Gramann, 2008).

The majority of studies have been performed on AN patients, with few exceptions. Legenbauer et al. (2008) found that patients with bulimia nervosa (BN) were less able to recognize surprise when compared to normal controls. The emotion recognition task consisted of seven emotions (anger, contempt, disgust, fear, happiness, sadness, and surprise) as well as neutral faces (Legenbauer et al., 2008). Another study

using the RME (Medina-Pradas, Navarro, Alvarez-Moya, Grau & Obiols, 2012) found that BN individuals significantly misclassified more positive emotions and neutral states than controls. Furthermore, no difference was found between BN patients and healthy controls when recognizing negative emotions. The authors suggest that BN patients in particular, avoid positive emotions and therefore have difficulty recognizing them. Additionally, the authors believe that eating disordered individuals in general, want to experience emotions even when they are not present. Therefore, these patients will misclassify neutral states, by selecting an emotion, because they have difficulty accepting neutrality in emotions (Medina-Pradas et al., 2012). It appears that AN and BN exhibit different patterns of emotion recognition deficits.

A few studies have examined non-clinical populations. It was found, that individuals who score high on the EAT-26 (representing subclinical levels of both AN and BN) were less able to discriminate happy, neutral, and angry faces while at the same time being able to more accurately discriminate surprise when compared to individuals who scored low on the EAT-26 (Jones et al., 2008). When viewing a series of video clips, individuals who scored high on the EDI-2 (representing subclinical levels of both AN and BN) were less able to recognize anger when compared to individuals who scored low on the EDI-2 (Ridout et al., 2010). The authors believed that these videos more accurately represented real life situations, in which individuals must comprehend and react to the emotions of others very quickly. Each of these video clips featured one of six primary emotions (happy, sad, anger, surprise, disgust, or fear) and a neutral emotion. Additionally, it was found that the inability to recognize anger in the high EDI-2 group was associated with body dissatisfaction. Because depression and AN have high

comorbidity rates, it was believed that depression might have had an effect. Yet, levels of depression did not affect the results (Ridout et al., 2010).

Dieters are considered a group at risk for developing an eating disorder, and have also been studied (see Heatherton & Polivy, 1992; Pringle et al., 2009). It was found that the number of neutral faces that were correctly identified as neutral and the number of times anger was wrongly chosen as an answer predicted EAT scores (Pringle et al., 2009). The more neutral faces correctly classified, and the more angry faces misclassified, the more eating pathology that was present. Additionally, depression and anxiety did not emerge as significant predictors of eating disorder symptomology (Pringle et al., 2009).

When questioned about their ability to understand and express emotions effectively, individuals with AN scored lower than controls (Jansch, Harmer & Cooper, 2009). It appears that AN individuals think that they have a deficit in this area. Jansch et al. (2009) utilized an emotion recognition task. They found that AN individuals answered fewer questions correctly, and took more time to respond than controls. When controlling for depression levels, some of these effects disappeared. However, the discrepancy in RTs between the two groups remained. It was found that individuals who misclassified faces as anger were unmedicated. On the other hand, participants who were on medication misclassified more faces as fear. Additionally, those who were not on medication were less able to discriminate disgust than those individuals who were currently taking medication (Jansch et al., 2009).

Recovered ANs have been compared to currently ill ANs. Oldershaw, Hambrook, Tchanturia, Treasure, and Schmidt (2010) found that the recovered ANs were better able

to recognize emotions from both voices and films than those who were currently ill. In the Reading the Mind in the Voice Task (RMV) (Golan, Baron-Cohen, Hill, & Rutherford, 2007), participants hear a list of sentences and must choose the correct emotion from a list. In the Reading the Mind in Films Task (RMF) (Golan, Baron-Cohen, Hill & Golan, 2006), participants view a series of video clips and must select how an individual is feeling from a list of emotions. This study also utilized The Level of Emotional Awareness Scale (LEAS) (Lane, Quinlan, Schwartz, Walker & Zeitlin, 1990); a series of vignettes are shown, and the participant must select how they would feel in the situation. Oldershaw et al. (2010) found that there was no difference between recovered ANs and healthy controls on the LEAS. However, the currently ill ANs performed worse than both the recovered ANs and controls. Additionally, recovered ANs were unable to differentiate positive emotions during the RME. They performed as poorly as those who were currently ill on this task (Oldershaw et al., 2010).

Kessler et al. (2006) presented participants with faces depicting one of six emotions (anger, fear, sad, happy, surprise, or disgust). They only allowed the participants to view the faces for 300 milliseconds before selecting the emotion, which may not have been long enough to identify differences between groups. The same face depicting a neutral state was shown prior to the emotional face. The eating disordered group correctly classified the same amount of faces as the control group (Kessler et al., 2006). Mendlewicz et al. (2005) studied five emotions (happy, angry, sad, disgust, and fear). AN patients were found to perform as well as controls (Mendlewicz et al., 2005). The results are mixed, as some studies were unable to find a significant difference between individuals with eating disorders and normal controls on an emotion recognition

task (Kessler et al., 2006; Mendlewicz, Linkowski, Bazelmans, & Philippot, 2005). Consequently, more research needs to be done in this area.

2.4 Emotion Processing and Regulation

AN individuals process emotional faces differently than healthy individuals. Pollatos et al. (2008) studied visual evoked potentials (VEPs) to investigate how AN patients process emotional faces. They found that the N200 amplitudes in AN patients were increased when viewing emotional faces when compared to controls. The authors concluded that the AN patients focused more attention on the faces than normal controls, because they did not have adequate templates for the faces available. Furthermore, the P300 amplitudes were highest with the AN individuals were viewing neutral faces (Pollatos et al., 2008). Paying special attention to neutral faces is in accordance with previous research that has suggested that AN search to find an emotion even when it is not present (Medina-Pradas et al., 2012). Actively searching for an emotion, when no emotion is present explains why AN patients frequently misclassify neutral faces.

When viewing faces expressing happiness, individuals with AN felt less happy than controls (Joos, Cabrillac, Hartmann, Wirsching, & Zeeck, 2009). The authors suggest that depression could explain this difference. AN patients experienced significantly more fear when viewing faces expressing anger than both BN individuals and controls. After controlling for depression, the effect increased in significance. Additionally, it was found that a mixed anger-fear category, which included pictures as well as faces, also produced increased fear in the AN patients. The authors suggest that AN individuals experience fear when confronted with anger in social situations.

Interestingly, when BN individuals view faces expressing anger, they experience less fear than controls (Joos et al., 2009).

Harrison, Genders, Davies, Treasure, and Tchanturia (2011) utilized an experimental measure of emotion regulation known as the Rosenzweig Picture Frustration Study (Rosenzweig, Clarke, Garfield, & Lehndorff, 1946). The task consists of a series of socially frustrating situations presented as a series of drawings, in which two individuals are having a conversation. Participants were required to write down what they believed the other individual would say in each situation. AN individuals responded with significantly more aggressive responses toward the other individual (Harrison et al., 2011), which have been described as immature by the creators of the measure (Rosenzweig et al., 1946). Interestingly, many times AN begins at puberty when a women's body begins to change. It was not found that individuals with AN are more likely to direct anger inward towards themselves, as there was no difference between groups. The authors suggest that the Rosenzweig Picture Frustration Study should ask participants to respond as they would, as opposed to how another individual would respond (Harrison et al., 2011).

Cooper Wells, and Todd (2004) developed a theory to define the development and maintenance of eating pathology, in which emotions hold a key role. It is believed that BN individuals binge and purge as a way to manage negative emotions. Cooper et al. (2004) propose that when BN individuals feel badly about themselves they eat to distract themselves, to avoid the negative emotion. Once the BN individual has consumed a large amount of food, he/she again feels badly and purges. Purging is believed to allow the individual to escape from the negative emotions (Cooper et al., 2004). The avoidance of

negative emotions could help explain why AN individuals perform especially poorly when recognizing negative emotions.

2.5 Alexithymia

Alexithymia is defined as difficulty identifying and describing emotions, lack of fantasies, and externally oriented thinking (Taylor, Bagby, & Parker, 1997). Alexithymia has been described as having “No words for emotion” (Zonnevijlle-Bendek et al., 2002 p. 38). It has been found that individuals with eating disorders such as AN and BN are alexithymic (see Kessler et al., 2006; Parling, Mortazavi, & Ghaderi, 2010; Schmidt, Jiwany, & Treasure, 1993). Adolescents diagnosed with eating disorders were found to score higher on an alexithymia scale than normal controls (Zonnevijlle-Bendek et al., 2002). Both AN and BN patients reported significantly lower levels of emotional awareness when compared to healthy controls (Gilboa-Schechtman, Avnon & Jeczmiem, 2006).

Currently, the most widely used scale for the measurement of alexithymia is the Toronto Alexithymia Scale or the TAS-20 (Taylor et al., 1997). However, this is a self-report measure and therefore may not be the best way to study this concept, because it is very difficult to be self-aware of an inability to express emotions (Parling et al., 2010). The TAS-20 was compared to a performance measure, the LEAS, and it was found that ANs scores on the TAS-20 were significantly higher than controls. There was no difference between ANs and controls on the LEAS and after controlling for depression and anxiety; there was no difference between groups on the TAS-20. The authors suggest that ANs believe that they have problems recognizing and processing emotions, but when actually performing such a task, they perform as well as controls (Parling et al., 2010).

Negative body image was associated with an inability to recognize one's own emotions (see Legenbauer et al., 2008). Body dissatisfaction is a key component of eating disorder symptomology (American Psychiatric Association, 2000). Legenbauer et al. (2008) found that the higher an individual scored on the EDI-2 subscales drive for thinness and body dissatisfaction, the less likely they were to recognize their own emotions. However, the self-report nature of these measures needs to be considered, as participants may not answer completely accurately. Additionally, alexithymia did not emerge as a significant predictor of anger recognition (Ridout et al., 2010). However, alexithymia did emerge as a significant predictor for overall emotion recognition (Ridout et al., 2010). It appears that the relationship between alexithymia and emotion recognition is yet to be determined. Building on this previous research, the current study is designed to see if a deficit in emotion recognition can be primed in healthy participants.

2.6 Research Purpose

There were two purposes of the current research study. The first was to explore ways in which exposure to images of the thin ideal can have a negative effect on those without an eating disorder. These images are seen everywhere in society, and therefore, it is very important to study their effects. The second purpose was to see if exposure to an overweight prime improved performance on an emotion recognition task. It was hypothesized that those primed with the overweight images would respond faster than those primed with the thin ideal. Previous research has found that individuals with AN have difficulties recognizing emotions (see Harrison et al., 2009; Kucharska-Pietura et al., 2004; Zonnevijlle-Bendek et al., 2002). The thin ideal prime is expected to perform similarly to AN individuals on the emotion recognition task, due to priming body

dissatisfaction in these participants. Consequently, they were expected to take longer to respond to the faces than both the control and the group primed with the overweight images. Furthermore, body dissatisfaction was not expected to be primed by viewing overweight images; therefore, participants were not expected to experience the same deficits as the thin ideal prime. Moreover, mood was expected to increase after viewing images of overweight women (van den Berg & Thompson, 2007). According to the mood congruency hypothesis, happy individuals will more easily recognize happy faces (Bower, 1981). Consequently, participants in the overweight prime group were expected to perform exceptionally well in the happy condition.

2.7 Research Design

The current study consisted of a 3 X 4 mixed design. There were three levels of the between participants factor Prime Type (thin, overweight, and control). There were four levels of the within participants factor Emotion Type (happy, sad, surprise, and anger).

2.8 Specific Hypotheses

Hypothesis 1 – Participants in the thin ideal prime group were expected to differ significantly from the other prime groups. In other words, a main effect for Prime Type was expected, and planned comparisons were expected to reveal that the thin ideal prime group took longer to respond and misclassified more faces than both the control and overweight prime.

Hypothesis 2 – It was expected that the emotions would differ significantly from one another. In other words, a main effect for Emotion Type was predicted, and planned comparisons were expected to reveal that the emotion happy was recognized faster and more accurately than sad, surprise, and anger across all priming groups.

Hypothesis 3 – An interaction was expected to emerge between Prime Type and Emotion Type. RTs and percentage correct (PCs) to the different emotion types were expected to differ by prime group, as follows.

Hypothesis 3a - The following results were expected for participants in the control prime group:

Faster RTs and higher accuracy to happy faces than the sad faces (Hypothesis 3a1)

Faster RTs and higher accuracy to the happy faces than to the anger faces (Hypothesis 3a2)

Faster RTs and higher accuracy to the happy faces than to the surprise faces (Hypothesis 3a3)

Equivalent RTs and accuracy to the sad and anger faces (Hypothesis 3a4)

Equivalent RTs and accuracy to the anger and surprise faces (Hypothesis 3a5)

Equivalent RTs and accuracy to the sad and surprise faces (Hypothesis 3a6)

Hypothesis 3b - The following results were expected for participants in the thin ideal prime group:

Faster RTs and higher accuracy to the happy faces than to the sad faces (Hypothesis 3b1)

Faster RTs and higher accuracy to the happy faces than to the anger faces (Hypothesis 3b2)

Faster RTs and higher accuracy to the happy faces than to the surprise faces (Hypothesis 3b3)

Faster RTs and higher accuracy to the sad faces than to the anger faces

(Hypothesis 3b4)

Faster RTs and higher accuracy to the surprise faces than to the anger faces

(Hypothesis 3b5)

Equivalent RTs and accuracy to the sad and surprise faces (Hypothesis 3b6)

Recall that the advantage for happy faces is based on previous work in support of the happy face advantage in which happy faces are recognized more accurately and more quickly than other emotions (Feyereisen et al., 1986; Kirita & Endo, 1995). Faster RTs to the happy faces than to the sad faces contradicts the mood congruency hypothesis, (Bower, 1981), which states that individuals who are currently feeling sad will more easily recognize sad faces. In this instance, participants in the thin ideal prime were expected to mirror AN individual's performance when responding to sad faces. Previous research has found that ANs perform worse when recognizing sad faces than when recognizing happy faces (Kucharska-Pietura et al., 2003; Pollatos et al., 2008). Also recall that previous research found the greatest deficit for anger in participants high in body dissatisfaction (Ridout et al., 2010). Presumably participants in the thin ideal prime group in the current study experienced greater body dissatisfaction as a consequence of viewing the thin ideal prime, which is why I predicted slower RTs to anger than to sad and surprise in this group. Finally, there is no basis in the literature or otherwise for a difference in RT between sad and surprise for the thin ideal prime group.

Hypothesis 3c - The following results were expected for participants in the overweight prime group:

Faster RTs and higher accuracy to the happy faces than to the sad faces

(Hypothesis 3c1)

Faster RTs and higher accuracy to the happy faces than to the anger faces

(Hypothesis 3c2)

Faster RTs and higher accuracy to the happy faces than to the surprise faces

(Hypothesis 3c3)

Equivalent RTs and accuracy to the sad and anger faces (Hypothesis 3c4)

Equivalent RTs and accuracy to the anger and surprise faces (Hypothesis 3c5)

Equivalent RTs and accuracy to the sad and surprise faces (Hypothesis 3c6)

Previous results suggest that body satisfaction for participants in the overweight prime condition will increase after viewing the overweight images (van den Berg & Thompson, 2007), which in turn is expected to improve their mood. Consequently, the happy face advantage for participants in the overweight prime condition was expected to be exaggerated, consistent with the mood congruency hypothesis, in which happy individuals will have an increased ability to recognize happy faces (Bower, 1981). Therefore, one final analysis directly compared the happy face advantage for participants in each of the three prime groups. Specifically, independent t-tests comparing RTs to the happy faces were expected to reveal a significantly greater happy face advantage in the overweight prime group relative to the thin ideal and control prime groups (and no difference was expected between the thin ideal and control prime groups).

Hypothesis 4 – A relationship was expected to emerge between individuals who scored high on the EDI-2 and those who scored low. In particular, it was expected that those who scored high on the EDI-2 would resemble eating disordered individuals.

Therefore, those who scored low were expected to respond faster and exhibit higher accuracy when identifying the emotions than those who scored high on the EDI-2. A median split in the data produced the High and Low EDI-2 groups.

CHAPTER III

EXPERIMENT: THE EMOTION RECOGNITION TASK

3.1. Method

3.1.1 Participants.

Eighty-two female undergraduate students were recruited from the Cleveland State University Psychology Department participant pool. All participants received credit towards a research requirement or extra credit for their participation. Participants were randomly assigned to one of three priming conditions. Each priming group was then divided into four subsections. Each subgroup viewed a different order of answer choices on the screen. Therefore, the number of participants in each prime group needed to be divisible by four. Because the last cycle of four participants was not completed, for both the overweight and control prime group, the last three participants in each group were removed from the analysis, which yielded a sample size of 76. Participants were told that they were participating in a study investigating contemporary mass media images. Demographic information is presented in Table 1.

Table 1. Mean (M) and Standard Deviation (SD) for Age, Grade Level, and Race.

	Thin Ideal Prime (n = 28)	Overweight Prime (n = 24)	Control Prime (n= 24)	Total (n = 76)
Age in years	20.61 (4.64)	18.79 (.83)	22.67 (10.02)	20.68 (6.42)
Class				
Freshman	19	19	16	54
Sophomore	3	2	6	11
Junior	3	1	1	5
Senior	1	0	0	1
Other	2	2	1	4
Race				
White/Caucasian	16	18	13	47
African American	6	5	8	19
Other	6	1	3	10

3.1.2 Stimulus Material.

Pilot testing was performed to choose the pictures that were used to prime the participants. Five female undergraduate participants were asked to rate 20 images of very thin models (downloaded from the internet) on how much the image was in accordance with their own perception of ideal female body image on a scale from 1 (not at all) to 5 (very much) (see Appendices A, B, & C for the informed consent, instructions, and example of the thin ideal pilot, respectively). The 13 pictures with the highest ratings were chosen for the thin ideal prime, because previous research has used a set of 13 images to prime participants (Johansson, Lundh, & Andersson, 2005; Markis & McLennan, 2011). A second pilot study was also conducted. A second sample of five undergraduate females were asked to rate 20 images of overweight models (downloaded from the internet) on how much the image was in accordance with their own perception of ideal female body image on a scale from 1 (not at all) to 5 (very much) (see

Appendices A, B, & D for the informed consent, instructions, and example of the overweight pilot, respectively). The 13 pictures with the lowest scores were chosen for the overweight prime.

Finally, a second round of pilot testing was performed to create the emotion recognition task. Ten undergraduate females were photographed depicting each of the four emotions (happy, sad, surprise, and anger), yielding a total of 40 images (see Appendix E for the informed consent for this pilot). However, for two of the participants, it was difficult to identify the emotion that was being expressed. Therefore, those eight images were removed, which left 32 images for the emotion recognition task. Ten separate female undergraduate participants were asked to classify each image. This pilot study consisted of two parts. In part one, participants were asked to type the emotion they believed the face was expressing into a text box. In part two, participants were asked to select their answer choice from a list of four possible emotions (happy, sad, surprise, or anger). Each face was randomly presented once in each part (See Appendices F, G, H, I, & J for the informed consent, instructions, and examples of both part one and part two for this pilot study, respectively). For the face to be considered a valid representation of the desired emotion, at least seven of the 10 participants must have correctly classified the face, utilizing the forced choice method. Using this criterion, 20 images were considered valid. The emotion recognition task required more than 20 images. Therefore, a second round of this pilot study was conducted. A second group of eight female undergraduates were asked to model each of the four emotions (happy, sad, surprise, or anger) (see Appendix E for the informed consent for this pilot). Once the images were photographed, a second group of 10 undergraduate females were asked to identify each of the 32

images. Again, there was two parts to this pilot study (see Appendices F, G, H, I, & J for the informed consent, instructions, and examples of both part one and part two for this pilot study, respectively). Utilizing the same criterion, 20 images were considered valid. Combining the valid images from both pilot studies yielded an emotion recognition task of 40 images, which was used for the main experiment.

There were three priming groups. The first condition consisted of 13 images of very thin women (the thin ideal condition). The second condition consisted of 13 images of overweight women (the overweight condition). The third condition consisted of 13 images of cars downloaded from the Internet (the control condition). Markis & McLennan (2011) utilized gender-neutral shoes as the control condition. However, because shoes are clothing, the images may have caused participants to think about their bodies. Cars are not expected to cause participants to think about their bodies.

In the emotion recognition task, pictures of faces expressing one of four emotions (happy, sad, surprise, and anger) were presented on the computer screen. The four answer choices appeared above each image. The answer choices and images appeared on the screen at the same time (see Appendix W for an example). Participants selected one of the four options (happy, sad, surprise, or anger) using the button box. The answer choices also appeared above each button. The participant used her dominant hand to press the button that she believed each face was expressing. There were four orders in which the answer choices were presented on the screen and the button box (e.g., left to right: happy, sad, surprise, anger). For each order, the choices remained the same for the entire experiment. Order was counterbalanced across participants. RTs were measured from the

onset of the image to the onset of the participant's response. The number of faces misclassified was also recorded.

3.1.3 Apparatus.

The priming task and emotion recognition task were presented with Superlab software (version 4.0.7b; Cedrus Corporation, San Pedro, CA, USA) for Mac OS X. RTs in milliseconds were recorded during the emotion recognition task once the images appeared on the screen and stopped once a participant selected an answer.

3.1.4 Procedure.

Prior to coming to the laboratory for the experiment, participants filled out the EDI-2 online through surveymonkey (see Appendix K for the informed consent). Doing so in advance minimized the likelihood that the answers to this survey would bias participants' performance on the emotion recognition task (van den Berg & Thompson, 2007). Additionally, potential differences between those who scored high on the survey and those who scored low were later identified. Participants were also asked to provide some demographic information online as well as whether or not they have ever been diagnosed with an eating disorder. If they responded that they had been diagnosed with an eating disorder, they were then asked which one and about past and current treatments. Being previously diagnosed with an eating disorder did not exclude any participant from the analysis. Additionally, height and weight were asked to record body mass index (BMI). Gilboa-Schechtman et al. (2006) suggested using BMI as a control variable, which may increase the validity of the results. Finally, participants were asked whether or not they were currently taking any medications, as medications may affect the central nervous system (Jones et al., 2008). Depression and anxiety were not measured because

in the majority of studies, the results were unaffected (see Jones et al., 2008; Nandrino, Berna, Hot, Latree, Decharles & Sequeria, 2012; Ridout et al., 2010). Yet, depression was found to affect the results in one study (see Jansch et al., 2009). Taking this survey online encouraged participants to respond more accurately, as they may have felt less embarrassed when answering the questions compared to answering the questions in person (see Appendix L for the complete survey). The survey data was stored in an Excel file by CSU ID number to keep the information confidential.

Participants came to the lab to complete the second part of the experiment (see Appendix M for the informed consent). Participant's CSU ID number was the only linking information from the experiment to information from the online survey. Once the results were linked, each participant was assigned a number, which was used for the analyses. All participants were tested individually and asked to give their informed consent before participating in the study. Participants were randomly assigned to one of three priming groups (thin ideal, overweight, or control) (see Appendices N, O, P, Q, & R for the instructions and examples of each of the primes, respectively). Each of the 13 pictures presented in each of the priming conditions were shown for 30 seconds, one at a time, as was done in previous research and therefore expected to be long enough to produce a priming effect (Markis & McLennan, 2011). It took 6.5 minutes to view the 13 images. Participants who viewed either the thin or overweight models were asked to rate to what extent each model was in accordance with their own perception of ideal female body image on a four point scale (1 = not at all to 4 = very much). Similarly, participants who viewed the images of cars were asked to rate to what extent each car was in

accordance with their own perception of good looking cars using the same four point scale. The priming task took place in the same room as the emotion recognition task.

Next, each participant performed the same emotion recognition task on an individual basis. Each of the four conditions had an equal number of faces, presented in a random order for each participant (see Appendices S, T, U, V, & W for instructions for each version of the emotion recognition task and an example, respectively). Participants were instructed to identify the correct emotion from a list of four possible emotions. Reaction times (RTs) and percentages correct (PCs) were recorded and compared across the three priming groups. Each emotion was also compared against the other emotions. Upon completion of the study, participants were debriefed, thanked for their participation, and given credit for the study. Each experimental session took no more than 30 minutes.

3.2 Results

3.2.1 Reaction Time Results.

The three priming groups did not appear to differ in age, race, or grade level (see Table 1). To control for outliers in emotion recognition reaction times, RTs three standard deviations above and below the mean for each emotion were removed for each participant (overall less than 1% of all responses). Errors on the emotion recognition task ranged from 0% to 30%, with a mean of 10.65%.

3.2.1.1 Is the thin ideal prime slower?

A 3 X 4 mixed analysis of variance (ANOVA) with Prime Type as a between participants factor and Emotion Type as a within participants factor was performed. There was a main effect of Prime Type, $F(2, 73) = 3.41, p = .04, \eta_p^2 = .09$. This was

consistent with Hypothesis 1, because participants were expected to significantly differ across prime groups. Yet, planned comparisons revealed that the overweight prime ($M = 1708.62$) was significantly faster than the thin ideal prime ($M = 1959.23$), $p = .03$. Furthermore, the overweight prime was significantly faster than the control prime ($M = 1990.95$), $p = .02$. Finally, RTs for the thin ideal prime did not significantly differ from the control prime, $p = .96$.

3.2.1.2 Are RTs to the happy faces faster?

Overall, there was a main effect for Emotion Type, $F(3, 219) = 29.50, p < .01, \eta_p^2 = .29$. This finding was consistent with Hypothesis 2; participants' RTs to the four emotions were expected to differ significantly. Planned comparisons revealed that each emotion differed significantly from each of the others (all $ps < .001$), except sad and surprise which did not significantly differ from one another, $p = .43$. See Table 2 for the mean RTs for each emotion.

Table 2: Mean RTs in (ms) for Each Emotion

Emotion Type	Happy	Sad	Surprise	Anger
Mean	1588.61	1815.07	1875.82	2265.55

3.2.1.3 Is there a Prime Type X Emotion Type interaction in RTs?

The Prime Type X Emotion Type interaction did not approach significance $F(6, 219) = .76, p = .60, \eta_p^2 = .02$. This finding is inconsistent with Hypothesis 3, as RTs to the different emotions were expected to differ by prime group. See Table 3 for mean RTs for prime by emotion type.¹

¹Only three participants in our sample admitted to being diagnosed with an eating disorder. All three participants were in the thin-ideal prime group. A 3 X 4 mixed ANOVA was completed with these three participants removed, along with the final participant in the thin ideal prime group, to keep the number of participants divisible by 4. The pattern of results remained the same. There was a main effect of Prime Type $F(2, 69) = 3.81, p = .03, \eta_p^2 = .10$. Planned comparisons revealed that the overweight prime ($M = 1708.62$) was significantly faster than the thin ideal prime ($M = 1977.50$), $p = .02$. Furthermore, the overweight prime was significantly faster than the control prime ($M = 1990.95$), $p = .02$. Finally, RTs for the thin ideal prime did not significantly differ from the control prime, $p = .91$. There was a main effect of Emotion Type $F(3, 207) = 30.34, p < .01, \eta_p^2 = .31$. Paired comparisons revealed that each emotion was significantly different from one another (all $ps < .01$), except for sad and surprise, which did not significantly differ from one another, $p = .57$. This result matches the pattern above. Finally, The Prime Type X Emotion Type interaction did not approach significance $F(6, 207) = .98, p = .44, \eta_p^2 = .03$.

Table 3. Mean RTs in ms for Prime by Emotion Type

Prime	Happy	Sad	Surprise	Anger	Mean
Thin Ideal	1603.10	1843.16	1969.86	2420.81	1959.23
Overweight	1442.61	1614.36	1763.14	2014.36	1708.62
Control	1720.14	1987.70	1894.47	2361.48	1990.95
Mean	1588.62	1815.07	1875.82	2265.55	

Traditionally, the interaction should be significant before group comparisons are made. However, because the predictions were made in advance, I decided to continue with an examination of potential group differences. For the control prime, RTs to the happy faces were significantly faster than RTs to the sad faces ($p = .05$). This result was consistent with hypothesis 3a1, as RTs to the happy faces were expected to be significantly faster than the RTs the sad faces. Hypothesis 3a2 was supported, as RTs to the happy faces were significantly faster than the RTs to the anger faces ($p < .01$). Furthermore, hypothesis 3a3 was supported, as RTs to the happy faces were significantly faster than the RTs to the surprise faces ($p = .03$). Yet, RTs to the sad faces were significantly faster than RTs to the anger faces ($p = .02$). This result is inconsistent with hypothesis 3a4, as equivalent RTs were expected for the sad and anger faces. Furthermore, RTs to the surprise faces were significantly faster than RTs to the anger faces ($p < .01$). This result does not support Hypothesis 3a5, as equivalent RTs were expected for the anger and surprise faces. Finally, hypothesis 3a6 was supported, as RTs between the sad and surprise faces did not differ significantly, $p = .55$.

For the thin ideal prime, Hypothesis 3b1 was supported, as RTs to the happy faces were significantly faster than the RTs to the sad faces ($p = .01$). Furthermore, Hypothesis 3b2 was also supported, as RTs to the happy faces were significantly faster than the RTs to the anger faces ($p < .01$). RTs to the happy faces were also significantly faster than the RTs to the surprise faces ($p = .01$). This result is consistent with Hypothesis 3b3, as RTs

to the happy faces were expected to be significantly faster than the RTs to the surprise faces. Hypothesis 3b4 was also supported, as RTs to the sad faces were significantly faster than the RTs to the anger faces ($p = .01$). Hypothesis 3b5 was also supported, as RTs to the surprise faces were significantly faster than the RTs to the anger faces ($p = .01$). Finally, RTs to the sad and surprise faces did not differ significantly ($p = .35$), which is consistent with hypothesis 3b6.

For the overweight prime, Hypothesis 3c1 was supported, as RTs to the happy faces were significantly faster than the RTs to the sad faces ($p = .02$). Furthermore, Hypothesis 3c2 was also supported as the RTs to the happy faces were significantly faster than the RTs to anger faces ($p = .01$). Additionally, RTs to the happy faces were significantly faster than the RTs to the surprise faces ($p = .01$). This result is consistent with Hypothesis 3c3. However, RTs to the sad faces were significantly faster than the RTs to the anger faces ($p = .01$). This result is inconsistent with Hypothesis 3c4, as it was expected that the RTs to the sad and anger faces would be equivalent. Furthermore, RTs to the surprise faces were significantly faster than the RTs to the anger faces ($p = .04$). This result does not support Hypothesis 3c5, as it was expected that the RTs to the surprise and anger faces would be equivalent. Finally, Hypothesis 3c6 was supported, as RTs to the sad and surprise faces did not significantly differ, $p = .15$.

3.2.2 Percentage Correct Results.

A second 3 X 4 mixed analysis of variance (ANOVA) with Prime Type as a between participants factor and Emotion Type as a within participant factor was completed for PCs. To control for outliers in emotion recognition percent correct, PCs

three standard deviations above and below the mean for each emotion were removed for each participant (overall less than 1% of all responses).

3.2.2.1 *Is the thin ideal prime less accurate?*

The main effect of Prime Type was not significant $F(2, 73) = .04, p = .96, \eta_p^2 = .01$. This result does not support Hypothesis 1, as participants in the thin ideal prime were expected to correctly classify fewer emotions than both the overweight and control prime group.

3.2.2.2 *Are happy faces recognized the most accurately?*

There was a main effect for Emotion Type, $F(3, 219) = 38.91, p < .01, \eta_p^2 = .35$. This finding was consistent with Hypothesis 2, as the emotions were expected to differ significantly from one another. Planned comparisons revealed that each emotion differed significantly from each of the others (all $ps < .03$). See Table 4 for the mean PCs for each emotion.

Table 4: Mean PCs for Each Emotion

Emotion Type	Happy	Sad	Surprise	Anger
Mean	97.90	92.43	86.05	82.86

3.2.2.3 *Is there a Prime Type X Emotion Type interaction in PCs?*

The Prime Type X Emotion Type interaction did not approach significance $F(6, 219) = .26, p = .95, \eta_p^2 = .01$. This finding did not support Hypothesis 3, as PCs to the different emotions were expected to differ by prime group². See Table 5 for mean PCs for prime group by emotion type.

²Only three participants in our sample admitted to being diagnosed with an eating disorder. All three participants were in the thin-ideal prime group. A 3 X 4 mixed ANOVA was completed with these three participants removed, along with the final participant in the thin ideal prime group, to keep the number of participants divisible by 4. The pattern of results remained the same. There was not a main effect of Prime Type $F(2, 69) = .05, p = .95, \eta_p^2 < .01$. There was a main effect of Emotion Type $F(3, 207) = 38.55, p < .01, \eta_p^2 = .36$. Planned comparisons revealed that each emotion differed significantly from one another (all $ps < .03$). Finally, The Prime Type X Emotion Type interaction did not approach significance $F(6, 207) = .18, p = .98, \eta_p^2 < .01$.

Table 5. Mean PCs for Prime by Emotion Type

Prime	Happy	Sad	Surprise	Anger	Mean
Thin Ideal	97.86	91.79	86.07	82.86	89.64
Overweight	98.33	92.08	87.08	80.83	89.58
Control	97.50	93.41	85.00	80.83	89.12
Mean	97.90	92.43	86.05	81.51	

Even though the interaction was not significant, I decided to continue with an examination of possible group differences, because the predictions were made in advance. Participants in the control prime group were significantly more accurate when recognizing the happy faces compared to the sad faces ($p = .01$). This result is consistent with Hypothesis 3a1, as accuracy to the happy faces was expected to be significantly higher than the accuracy to the sad faces. Hypothesis 3a2 was also supported, as accuracy to the happy faces was significantly higher than accuracy to the anger faces ($p < .01$). Furthermore, Hypothesis 3a3 was supported, as accuracy to the happy faces was significantly higher than the accuracy to the surprise faces ($p < .01$). Accuracy to the sad faces was significantly higher than accuracy to the anger faces ($p = .01$). This result is inconsistent with Hypothesis 3a4, as accuracy was expected to be equivalent for the sad and anger faces. Accuracy to the surprise faces was not significantly different from the accuracy to the anger faces, $p = .25$. This result supports Hypothesis 3a5, as equivalent accuracy was expected for the anger and surprise faces. Finally, accuracy to the sad faces was significantly higher than accuracy to the surprise faces ($p < .01$). This result is inconsistent with Hypothesis 3a6, as equivalent accuracy was expected for the sad and surprise faces.

For the thin ideal prime, Hypothesis 3b1 was supported, as accuracy to the happy faces was significantly higher than accuracy to the sad faces ($p = .01$). Furthermore, Hypothesis 3b2 was also supported, as accuracy to the happy faces was significantly

higher than accuracy to the anger faces ($p < .01$). Accuracy to the happy faces was also significantly higher than accuracy to the surprise faces ($p < .01$). This result is consistent with Hypothesis 3b3, as accuracy to the happy faces was expected to be significantly higher than the accuracy to the surprise faces. Hypothesis 3b4 was also supported, as accuracy to the sad faces was significantly higher than accuracy to the anger faces ($p = .01$). Accuracy to the surprise faces did not differ significantly from accuracy to the anger faces, $p = .30$. This result is inconsistent with Hypothesis 3b5, as accuracy to the surprise faces was expected to be significantly higher than accuracy to the anger faces. Finally, accuracy to the sad faces was significantly higher than accuracy to the surprise faces ($p = .02$). This finding does not support Hypothesis 3b6, as accuracy was expected to be equivalent for the sad and surprise faces.

For the overweight prime, Hypothesis 3c1 was supported, as accuracy to the happy faces was significantly higher than the accuracy to the sad faces ($p = .01$). Furthermore, Hypothesis 3c2 was also supported, as accuracy to the happy faces was significantly higher than the accuracy to anger faces ($p < .01$). Additionally, accuracy to the happy faces was significantly higher than the accuracy to the surprise faces ($p = .01$). This result is consistent with Hypothesis 3c3. Furthermore, accuracy to the sad faces was significantly higher than the accuracy to the anger faces ($p = .01$). This result is inconsistent with Hypothesis 3c4, as equivalent accuracies were expected for the sad and anger faces. Accuracy to the surprise faces did not significantly differ from the accuracy to the anger faces, $p = .08$. This result supports Hypothesis 3c5, as equivalent accuracies were expected for the surprise and anger faces. Finally, accuracy to the sad faces was significantly higher than the accuracy to the surprise faces ($p = .03$). This finding is

inconsistent with Hypothesis 3c6, as accuracies were expected to be equivalent for the sad and surprise faces.

3.2.3 Is there a greater happy face advantage in the overweight prime group?

Independent *t*-tests comparing RTs to the happy faces were conducted to compare the happy face advantage among the three prime groups. RTs to the happy faces were significantly faster in the overweight prime group compared to the control prime group, $t(46) = -2.41, p = .02$. Yet, RTs to the happy faces did not differ between the overweight and thin ideal prime group, $t(50) = 1.5, p = .14$. Furthermore, RTs to the happy faces did not differ between the control prime group and the thin ideal prime group, $t(50) = -1.03, p = .31$. It appears that the happy face advantage was exaggerated for the overweight prime group relative to the control prime group.

3.2.4 RT Results analyzed as a function of EDI-2 scores.

To test Hypothesis 4, I performed a 2 X 3 X 4 mixed ANOVA with High and Low EDI-2 and Prime Type as between participants factors and Emotion Type as a within participants factor. A median split created the high and low EDI-2 groups. Each item was scored according to the suggestions of Garner et al. (1983). The survey contained a 6-point likert scale format. The scores were recoded so that the possible scores ranged from 0 to 3 (Always = 3, Usually = 2, Often = 1, Sometimes = 0, Rarely = 0, and Never = 0). An overall EDI-2 score was created by taking the sum of each of the 64 items on the measure. Missing data were replaced with the mean of the remaining values for each participant (less than 1% of all responses). There was a main effect for Prime Type $F(2, 70) = 5.03, p = .01, \eta_p^2 = .13$. The overweight prime group was again found to be significantly faster than both the thin ideal prime group ($p < .02$)

and the control prime group ($p < .01$). The control prime group and thin prime group did not significantly differ, $p = .51$.

There was a main effect for Emotion Type $F(3, 210) = 27.16, p < .01, \eta_p^2 = .28$. Each emotion significantly differed from one another (all $ps < .001$), except sad and surprise, which did not significantly differ from one another ($p = .47$), which mirrors the previous RT analysis.

There was a main effect for High and Low EDI-2 $F(1, 70) = 6.722 p = .01, \eta_p^2 = .09$, indicating that individuals who scored high on the EDI-2 ($M = 1771.77$) were significantly faster than those individuals who scored low on the EDI-2 ($M = 2012.78$). This finding is inconsistent with Hypothesis 4, as it was expected that those who scored highly on the EDI-2 would take longer to respond when selecting the correct emotion than those who scored low on the EDI-2.

The Prime Type X Emotion Type interaction did not approach significance $F(6, 210) = 1.05 p = .39, \eta_p^2 = .03$. This finding is also consistent with the previous analysis. The High and Low EDI-2 X Emotion Type interaction was significant, $F(3, 210) = 2.98 p = .03, \eta_p^2 = .04$. See Table 6 for mean RTs to the different emotions by high and low EDI-2 score

Table 6. Mean RT to the Different Emotions by High and Low EDI-2 in ms

	Happy	Sad	Surprise	Anger	Mean
High	1540.24	1752.08	1788.41	2006.34	1771.77
Low	1649.18	1902.51	1982.11	2517.29	2012.77
Mean	1594.71	1827.23	1885.26	2261.82	

The Prime Type X High and Low EDI-2 interaction was marginally significant, $F(2, 70) = 2.51 p = .09, \eta_p^2 = .07$. Finally, the High and Low EDI-2 X Prime Type X Emotion Type interaction did not approach significance $F(6, 210) = .43 p = .86$,

$\eta_p^2 = .01$.

3.2.5 PC Results analyzed as a function of EDI-2 scores.

A second 2 X 3 X 4 mixed ANOVA with High and Low EDI-2 and Prime Type as between participants factors and Emotion Type as a within participants factor was completed for PCs. There was not a main effect for Prime Type $F(2, 70) = .16, p = .86, \eta_p^2 < .01$. This result also mirrors previous the PC analysis. There was a main effect for Emotion Type $F(3, 210) = 36.84, p < .01, \eta_p^2 = .35$. Each emotion significantly differed from one another (all $ps < .02$), which mirrors the previous PC analysis.

There was no main effect for High and Low EDI-2 $F(1, 70) = 2.61, p = .11, \eta_p^2 = .04$. This finding is inconsistent with Hypothesis 4, as it was expected that those who scored high on the EDI-2 would be less accurate when recognizing the emotions than those who scored low on the EDI-2.

The Prime Type X Emotion Type interaction did not approach significance $F(6, 210) = .20, p = .98, \eta_p^2 < .01$. This result was also consistent with the previous PC analysis. The High and Low EDI-2 X Emotion Type interaction was not significant $F(3, 210) = 1.24, p = .30, \eta_p^2 = .02$.

The Prime Type X High and Low EDI-2 interaction did not approach significance, $F(2, 70) = .20, p = .82, \eta_p^2 < .01$. Finally, the High and Low EDI-2 X Prime Type X Emotion Type interaction did not approach significance, $F(6, 210) = .69, p = .51, \eta_p^2 = .02$.

3.2.6 Potential group differences in RTs among high and low EDI-2 scorers.

I examined the mean of the high and low EDI-2 scores among the different prime groups in order to identify possible patterns of interest. A high EDI-2 group was created

for each prime group by taking the average of the top 25 percent of the ratings (top seven scores for the thin ideal prime group, top six scores for the overweight and control prime group). A low EDI-2 group was created for each prime group by taking the average of the bottom 25 percent of the ratings (bottom seven scores for the thin ideal prime group, bottom six scores for the overweight and control prime group). See Table 7 for RTs to the different emotions by high and low EDI-2 by prime group.

Table 7. RTs to the Emotions by High and Low EDI-2 by Prime in ms

Prime	Happy	Sad	Surprise	Anger	Mean
Thin Ideal					
High	1453.84	1724.72	1999.93	2060.29	1809.70
Low	1355.071	1638.80	1737.35	2308.16	1759.84
Overweight					
High	1409.75	1615.35	1779.42	1727.16	1632.92
Low	1485.27	1735.33	1969.20	2482.14	1918.00
Control					
High	1698.44	1795.84	1874.52	2134.70	1875.87
Low	1967.24	2232.38	2248.92	2776.86	2306.35
Mean					
High	1520.68	1711.97	1884.62	1974.05	
Low	1602.53	1868.84	1985.16	2522.39	

It appears that across all emotions, those participants who scored high on the EDI-2 exhibited a trend toward faster responding than those who scored low on the EDI-2. Furthermore, participants in both the overweight and control prime group showed a pattern of faster responses to the emotions when scoring high on the EDI-2, than when scoring low. Yet, a different pattern emerged for those participants in the thin ideal prime group. It appears that participants in the thin ideal prime who scored high on the EDI-2 showed a pattern of longer responses to the emotions than those participants in the thin ideal prime who scored low on the EDI-2. Looking at the individual emotions,

participants in the thin ideal prime group who scored high in the EDI-2 showed a pattern of longer responses to the happy, sad, and surprise faces, than those participants in the thin ideal prime who scored low on the EDI-2. Yet, for the anger faces, participants in the thin ideal prime who scored high on the EDI-2 showed a pattern of faster responses than those participants in the thin ideal prime who scored low on the EDI-2. See Table 8 for PCs to the different emotions by high and low EDI-2 by prime group.

3.2.7 Potential group differences in PCs among high and low EDI-2 scorers

Table 8. PCs to the Emotions by High and Low EDI-2 by Prime

Prime	Happy	Sad	Surprise	Anger	Mean
Thin Ideal					
High	98.57	92.86	95.71	90	94.29
Low	100	91.43	82.86	80	88.57
Overweight					
High	98.33	91.67	90	80	90
Low	100	90	86.67	85	90.42
Control					
High	100	93.33	86.67	86.67	91.67
Low	96.67	90	88.33	80	88.75
Mean					
High	98.97	92.62	90.79	85.56	
Low	98.89	90.48	85.95	81.67	

It appears that across all emotions, those participants who scored high on the EDI-2 exhibited a trend toward higher accuracy than those who scored low on the EDI-2. Furthermore, participants in both the thin ideal prime group and control prime group who scored high on the EDI-2 showed a pattern of higher accuracy when recognizing the emotions than those participants who scored low on the EDI-2. Yet, for participants in the overweight prime group there appears to be no difference in accuracy between those participants who scored high on the EDI-2 and those who scored low on the EDI-2. It

appears that the participants in the thin ideal prime group who scored high on the EDI-2 showed a pattern of lower accuracy when recognizing the happy faces than those participants in the thin ideal prime group who scored low on the EDI-2. Furthermore, it appears that the participants in the overweight prime group, who scored high on the EDI-2, showed a pattern of lower accuracy when identifying the anger and happy faces than those participants in the overweight prime group who scored low on the EDI-2.

3.2.8 Potential group differences in RTs among the high picture raters.

I examined the mean of the high picture rating scores among the thin ideal prime group and the overweight prime group in order to identify possible patterns of interest. A high rating group was created for the thin ideal prime by taking the average of the top 25 percent of the ratings (top seven scores). A high rating group was created for the overweight prime by taking the average of the top 25 percent of the ratings (top six scores). It was expected that the participants who viewed the photos of thin models and believed that the images depicted ideal female body image would take longer to respond to the emotions than those participants who viewed the images of the overweight models and believed that those images depicted ideal female body image. See Table 9 for mean RTs to the different emotions for the high picture ratings.

Table 9. RTs to the Different Emotions for the High Picture Ratings in ms

	Happy	Sad	Surprise	Anger	Mean
Thin Ideal	1597.17	1857.49	2418.70	2343.86	2054.31
Overweight	1455.95	1588.34	1851.25	2043.76	1734.82
Mean	1526.56	1722.92	2134.98	2193.81	

It appears that those participants who believed that the thin images depicted ideal female body image exhibited a trend toward longer responding to the emotions than those participants who believed that the overweight images depicted ideal female body image.

Furthermore, regardless of prime group, participants showed a pattern of longer responses when recognizing the anger faces compared to all other emotions, and a pattern of faster responses when recognizing the happy faces compared to all other emotions. Yet, the participants in the thin ideal prime who rated the images highly showed a pattern of longer responses to the surprise faces than to the anger faces. See Table 10 for mean PCs to the different emotions for the high picture ratings.

3.2.9 Potential group differences in PCs among the high picture raters.

Table 10. PCs to the Different Emotions for the High Picture Ratings

	Happy	Sad	Surprise	Anger	Mean
Thin Ideal	98.57	92.86	90	78.57	90
Overweight	100	93.33	80	86.67	90
Mean	99.29	93.10	85	82.62	

It appears that there is no difference in overall PCs between those participants who believed that the thin images depicted ideal female body image and those participants who believed that the overweight images depicted ideal female body image. Furthermore, regardless of prime group, participants showed a pattern of lower accuracy when recognizing the anger faces compared to all other emotions, and a pattern of higher accuracy when recognizing the happy faces compared to all other emotions. Additionally, participants in the thin ideal prime group showed a pattern of lower accuracy when recognizing the anger faces than those participants who were in the overweight prime group. Yet, participants in the thin ideal prime group showed a pattern of higher accuracy when recognizing the surprise faces than those participants who were in the overweight prime group.

3.2.10 Potential group differences in RTs among high and low BMI.

I examined the mean of the high and low BMI scores among the different prime groups in order to identify possible patterns of interest. A high BMI group was created for each prime group by taking the average of the top 25 percent of the BMIs (top seven BMIs for the thin ideal prime group, top six BMIs for the overweight and control prime group). A low BMI group was created for each prime group by taking the average of the bottom 25 percent of the BMIs (bottom seven BMIs for the thin ideal prime group, bottom six BMIs for the overweight and control prime group). See Table 11 for RTs to the different emotions by high and low BMI by prime group.

Table 11. RTs to the Different Emotions by High and Low BMI by Prime in ms

Prime	Happy	Sad	Surprise	Anger	Mean
Thin Ideal					
High	1573.21	1818.31	1960.54	2691.44	2010.88
Low	1500.63	1697.37	2051.13	2294.45	1885.89
Overweight					
High	1335.69	1478.06	2055.70	1985.10	1713.64
Low	1630.85	1817.19	1744.80	2138.70	1832.89
Control					
High	1823.22	2341.72	1924.02	2422.40	2127.84
Low	1800.18	1984.77	1867.41	2351.23	2000.90
Mean					
High	1577.37	1879.36	1980.09	2366.31	
Low	1643.89	1833.11	1887.78	2261.46	

Overall, it appears that for both the thin ideal prime group and the control prime group, participants with a high BMI exhibited a trend toward slower responding when recognizing the emotions than participants with a low BMI. Yet, for the overweight prime group, participants with a high BMI exhibited a trend toward faster responding to the emotions than participants with a low BMI. Furthermore, participants with a high BMI, regardless of prime group, showed a pattern of longer responses when identifying

sad, surprise, and anger than participants with a low BMI. Yet, participants with a high BMI showed a pattern of faster responses when recognizing the happy faces than participants with a low BMI. Interestingly, participants in the thin ideal prime group with a high BMI showed a pattern of faster responses when recognizing the surprise faces than participants in the thin ideal prime with a low BMI. Furthermore, participants in the overweight prime group with a high BMI showed a pattern of longer responses when identifying the surprise faces than participants in the overweight prime group with a low BMI. See Table 12 for PCs to the emotions by high and low BMI by prime group.

3.2.11 Potential group differences in PCs among high and low BMI.

Table 12. PCs to the Different Emotions by High and Low BMI by Prime

Prime	Happy	Sad	Surprise	Anger	Mean
Thin Ideal					
High	98.57	92.86	84.29	77.14	88.21
Low	95.71	85.71	90	84.29	88.93
Overweight					
High	100	95	88.33	86.67	92.50
Low	98.33	91.67	86.67	83.33	90
Control					
High	96.67	90	95	81.67	90.83
Low	96.67	91.67	81.67	70	85
Mean					
High	98.41	92.62	89.21	81.83	
Low	96.90	89.68	86.11	79.21	

Overall, it appears that participants in both the overweight and control prime group with a high BMI exhibited a trend toward higher accuracy when recognizing the emotions than participants in the overweight and control prime group with a low BMI. Yet, participants in the thin ideal prime group with a low BMI showed a pattern of slightly higher accuracy than participants in the thin ideal prime group with a high BMI. Furthermore, regardless of prime group, participants showed a pattern of lower accuracy when recognizing the anger faces compared to all other emotions, and a pattern of higher

accuracy when recognizing the happy faces compared to all other emotions. For the thin ideal prime group, participants with a high BMI showed a pattern of lower accuracy when recognizing anger and surprise than participants in the thin ideal prime with a low BMI. Yet, participants in the thin ideal prime group with a high BMI showed a pattern of higher accuracy when recognizing happy and sad than participants in the thin ideal prime group with a low BMI. Moreover, participants in the control prime group with a high BMI showed a pattern of higher accuracy when recognizing anger and surprise than participants in the control prime group with a low BMI. Yet, participants in the control prime group with a high BMI showed a pattern of lower accuracy when identifying the sad faces than participants in the control prime group with a low BMI.

3.3 Discussion

The current study was designed to investigate the effect of viewing thin media images on a subsequent emotion recognition task for participants without an eating disorder. It was predicted that participants primed with images of the thin ideal would both take longer to respond to the emotions and be less accurate when recognizing the emotions than both the overweight and control prime. Yet, the results of the current study indicate that viewing images of the thin ideal does not negatively affect emotion recognition performance. There are several explanations for this finding. First it is possible that the priming paradigm for the thin ideal prime was actually not strong enough, as in everyday life; individuals view a large number of thin media images. Therefore, the participants may have been accustomed to seeing the images, and more images may be necessary to create the effect. Moreover, as Tiggemann et al. (2009) found, it is possible that participants in the thin ideal prime group were not comparing

themselves to the image. It was assumed that asking the participants to rate the images would cause them to engage in social comparison. Yet, Tiggemann et al. (2009) asked a series of questions, which caused participants to engage in social comparison.

Furthermore, when participants viewed the images as inspiration, their mood increased (Tiggemann et al., 2009). Therefore, it is possible that some participants were comparing themselves to the thin images, while others were viewing the images as models or goals.

Interestingly, the overweight prime was significantly faster when recognizing the emotions than both the control prime and thin ideal prime. It appears that viewing images of overweight models allows individuals to more easily recognize emotions on an emotion recognition task. Emotions are a basic component of everyday social interactions (Kessler et al., 2006). The ability to accurately recognize and interpret the emotions of others is an important aspect of such interactions. Therefore, if overweight images were to become more prominent in the media, many young girls and women may be able to more easily interact socially. Yet, this would only be possible if these women and girls were engaged in downward comparison when viewing the images. It is also possible that viewing overweight models could have the same negative effects as viewing images of the thin ideal (Bessenoff, 2006; Utter et al., 2003), if downward comparison was not occurring.

Furthermore, it was predicted that the happy faces would be recognized faster and more accurately than all other emotions, due to the happy face advantage (Kirita & Endo, 1995). The results were in line with this prediction. Across, all priming groups the happy faces were recognized the fastest and the most accurately. Moreover, participants in the overweight prime group were significantly faster when recognizing the happy faces than

the control prime group. It appears that the happy face advantage (Kirita & Endo, 1995) was increased in the overweight prime relative to the control prime group. Priming with overweight images is a form of downward comparison and was expected to increase mood and body satisfaction (van den Berg & Thompson, 2007). The mood congruency hypothesis (Bower, 1981) states that individuals who are happy will more accurately recognize happy faces. Therefore, it is possible that viewing the overweight images caused participants to feel happy and therefore positively affected the recognition of happy faces.

The current study demonstrated a strong effect for emotion type. Furthermore, the overall pattern of speed and accuracy (e.g., from fastest and most accurate to slowest and least accurate: happy, sad, surprise, anger) remained the same across all analyses. Furthermore, there does not appear to be a speed-accuracy trade-off, as when responses were faster, they were also more accurate. Moreover, the difficulty in recognizing anger is important, as this was only expected in the thin-ideal prime, due to high levels of body dissatisfaction (Ridout et al., 2010). It is possible that anger was the most difficult emotion to recognize among the four emotions that were studied. Yet, these findings should be interpreted with caution, as the emotion recognition task consisted of undergraduate females modeling the different emotions on command. It is possible that the participants felt uncomfortable modeling the emotions that they were not currently feeling, which may have made the recognition task more difficult for those participants in the main experiment.

The finding that participants who scored higher on the EDI-2 were actually faster when recognizing the emotions than those participants who scored low on the EDI-2 was

inconsistent with our predictions. It has been suggested that individuals with high levels of eating pathology can actually perform better on certain tasks than individuals with low levels of eating pathology due to high levels of motivation (Kessler et al., 2006).

Therefore, it is possible that those who scored high on the EDI-2 were highly motivated to perform well and therefore responded faster than those who scored low on the EDI-2.

It is also possible that the individuals with high EDI-2 scores are constantly highly aroused and anxious, and therefore were able to respond faster than those who scored low on the EDI-2. Unfortunately, there is no way to know this for sure, as factors such as depression and anxiety were not measured, because in the majority of studies they did not affect the results (see Jones et al., 2008; Nandrino et al., 2012; Ridout et al., 2010). Yet, depression was found to affect the results in one study (see Jansch et al., 2009).

The finding that there was no difference in accuracy between those who scored low on the EDI-2 and those who score high on the EDI-2 was inconsistent with the Ridout et al. (2010) findings, which found that the participants who scored high on the EDI-2 were less accurate than those who scored low. Ridout et al. (2010) utilized a series of film clips, whereas the current study utilized a series of static images. This difference in methodology may account for the difference. Furthermore, Ridout et al. (2010) allowed participants to fill out the EDI-2 just before the emotion recognition task, whereas the current study allowed participants to fill out the EDI-2 on a completely different day. Finally, Ridout et al. (2010) required memory to perform the task, as participants were asked to identify the emotions once the video clip had ended. The current study allowed participants to identify the emotion while looking at the face.

This study has several limitations. First, the sample consisted of college students, and the results may not generalize to the general population. Secondly, factors such as depression and anxiety were not measured. Even though in the majority of studies, these factors did not affect the results (see Jones et al., 2008; Nandrino et al., 2012; Ridout et al., 2010), depression was found to affect the results in one study (see Jansch et al., 2009). A final limitation of the current study is that only four emotions were studied (happy, sad, surprise, and anger). Priming with thin and overweight images may have affects on emotions that are not included in this list.

In hindsight, there are several things I would do differently if I were to redo this study. First, I would ensure participants in the thin ideal prime were comparing themselves to the images by asking specific questions to engage them in comparison. Secondly, I would move the demographic questions to the end of the survey. This would ensure that participants' answers to these questions would not affect their responses to the EDI-2. Thirdly, I would measure depression and anxiety. Finally, I would ask participants to identify if they were currently taking a psychotropic medication, instead of asking more generally, if they were currently taking any sort of medication. This would ensure that participants were only reporting medications that may have an effect on an emotion recognition task (Jansch et al., 2009), and would therefore be able to be used in the analysis.

Future research should measure the length of priming effect for the overweight images. Specifically, future research should consider adding a distracter task between the prime and the emotion recognition task to better understand if the effect is short or long term. Secondly, future research should use differing numbers of images as the prime. It is

possible that decreasing the number of overweight images would remove the effect, whereas increasing the number of images may exaggerate the effect. Thirdly, future studies should utilize a more diverse sample to see if the results differ. Finally, future research should examine a longer list of emotions, once participants have been primed.

In light of the limitations, this study also has several strengths. First the current study did not measure the EDI-2 on the same day as the emotion recognition task, therefore; the participants were unlikely to be primed by the survey. Secondly, a performance task was utilized, which makes the results more valid than survey research. To the best of my knowledge, the current study was the first to prime participants prior to an emotion recognition task. Furthermore, the current study was the first to show that viewing overweight images positively affects emotion recognition performance.

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APPENDICES

APPENDIX A
(Informed Consent for Pilot Study)

**Photo Pilot
Participant Consent Form**

This research is being conducted by Kim Thomas as part of her thesis project for her Master's degree from the Psychology Department at Cleveland State University under the direction of her thesis advisor, Dr. Conor T. McLennan. Contact information for both Kim and Dr. McLennan appear below.

The purpose of this research is to investigate the effects of contemporary mass media images. As a participant, you will be asked to view a series of images taken from underwear and swimsuit advertisements. You will then have to rate how much each image is in accordance with your own view of ideal female body image. This experiment should take no longer than 30 minutes to complete. Please be aware that you are not required to participate in this research, and you may discontinue your participation at any time without penalty.

Your responses will be completely confidential. No personal identifying information will be asked at any time during the study. This form will be stored in a locked filing cabinet in the lab. Your ratings will be stored on a password-protected computer, by a participant ID number assigned by the researcher. Therefore, the confidentiality of your identity will be maintained at all times.

Risk associated with participation in this study is minimal and not beyond that of daily living. Potential risks include fatigue and possible discomfort from disclosing personal information. If you become tired, feel free to take as long as necessary to complete the survey.

If you need further assistance, you may schedule an appointment at the Cleveland State University Counseling and Testing Center by calling (216) 687-2277.

Participation in this study is completely voluntary and you may withdraw at any time. If you have any questions regarding this research, feel free to contact Kim Thomas at (216) 548-2983 or email her at k.d.thomas64@csuohio.edu, or call Dr. Conor T. McLennan at (216) 687-3750 or email him at c.mclennan@csuohio.edu.

There are two copies of this consent form. After signing them, keep one for your own records and return one to the researcher. Thank you in advance for participating in our research study. Please indicate your consent to participate by signing below.

"I am 18 years old or older and have read and understood this consent form. I voluntarily agree to participate in this study."

"If I have any questions about my rights as a research participant I can contact the Cleveland State University institutional Review Board at (216) 687-3630."

Signature: _____

Name: _____ (Please Print)

DATE: _____

APPENDIX B
(Instructions for Photo Pilot)

Language Research Laboratory
Chester Building Room 249

Welcome to The Language Research Laboratory. We appreciate your helping us today.

In the experiment that you will be participating in today, you will see 20 pictures taken from underwear and bathing suit advertising for women. Your task is to rate how much you think each picture depicts ideal female body image portrayed by the mass media, specifically visual media such as magazines and television.

You should make your rating on a scale from 1 to 5, where 1 = not at all, and 5 = very much. Feel free to use any number between 1 and 5 to make your ratings.

A typical trial will proceed as follows: a picture will appear on the screen. Take as much time as you would like to look at the picture, then press a number from 1 to 5 to indicate how much you think the picture depicts the thin ideal in the mass media. As soon as you have made a response, a new trial will begin.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX C
(Example of Photo Pilot)

THIN IDEAL



Please rate this picture on a scale from 1 (not at all) to 5 (very much) on how much you think this image depicts ideal female body image.

1
not at all

2
a little

3
moderately

4
quite a bit

5
very much

APPENDIX D
(Example of Photo Pilot)

OVERWEIGHT



Please rate this picture on a scale from 1 (not at all) to 5 (very much) on how much you think this image depicts ideal female body image.

1
not at all

2
a little

3
moderately

4
quite a bit

5
very much

APPENDIX E
(Informed Consent for Modeling of Emotional Faces)

**Informed Consent
Participant Consent Form**

This research is being conducted by Kim Thomas as part of her thesis project for her Master's degree from the Psychology Department at Cleveland State University under the direction of her thesis advisor, Dr. Conor T. McLennan. Contact information for both Kim and Dr. McLennan appear below.

The purpose of this research is to investigate the effects of contemporary mass media images. As a participant, you will be asked to model each of four emotions (happy, anger, sad, and surprise) to the best of your ability. A photo will be taken of you for each emotion. The photos will be used later for research purposes. This experiment should take no longer than 30 minutes to complete. Please be aware that you are not required to participate in this research, and you may discontinue your participation at any time without penalty.

Your responses will be completely confidential. No personal identifying information will be asked at any time during the study. This form will be stored in a locked filing cabinet in the lab. Your photos will be stored on a password-protected computer. Therefore, the confidentiality of your identity will be maintained at all times. However, as indicated above, the photos will be used for research purposes. In particular, several future participants in our lab will see photos of people expressing emotions (the photos of you AND photos of other people) and asked to identify the emotions being expressed. So, although we will not reveal your identity to anyone, many participants will see these photos, and it is possible that some of the participants will recognize you (for example, if anyone you know – family, friends, classmates, etc.) serve as participants in our experiments in the future.

Risk associated with participation in this study is minimal and not beyond that of daily living. Potential risks include fatigue and possible discomfort from having your picture taken. If you become tired, feel free to take as long as necessary to complete the study.

If you need further assistance, you may schedule an appointment at the Cleveland State University Counseling and Testing Center by calling (216) 687-2277.

Participation in this study is completely voluntary and you may withdraw at any time. If you have any questions regarding this research, feel free to contact Kim Thomas at (216) 548-2983 or email her at k.d.thomas64@csuohio.edu, or call Dr. Conor T. McLennan at (216) 687-3750 or email him at c.mclennan@csuohio.edu.

There are two copies of this consent form. After signing them, keep one for your own records and return one to the researcher. Thank you in advance for participating in our research study. Please indicate your consent to participate by signing below.

“I am 18 years old or older and have read and understood this consent form. I voluntarily agree to participate in this study.”

“If I have any questions about my rights as a research participant I can contact the Cleveland State University Institutional Review Board at (216) 687-3630.”

Signature: _____

Name: _____ (Please Print)

DATE: _____

APPENDIX F
(Informed Consent for Emotion Recognition Pilot)

**Informed Consent
Participant Consent Form**

This research is being conducted by Kim Thomas as part of her thesis project for her Master's degree from the Psychology Department at Cleveland State University under the direction of her thesis advisor, Dr. Conor T. McLennan. Contact information for both Kim and Dr. McLennan appear below.

The purpose of this research is to investigate the effects of contemporary mass media images. As a participant, you will be asked to view a series of faces and identify the emotion being expressed. This experiment should take no longer than 30 minutes to complete. Please be aware that you are not required to participate in this research, and you may discontinue your participation at any time without penalty.

Your responses will be completely confidential. No personal identifying information will be asked at any time during the study. This form will be stored in a locked filing cabinet in the lab. Your ratings will be stored on a password-protected computer, by a participant ID number assigned by the researcher. Therefore, the confidentiality of your identity will be maintained at all times.

Risk associated with participation in this study is minimal and not beyond that of daily living. Potential risks include fatigue and possible discomfort from disclosing personal information. If you become tired, feel free to take as long as necessary to complete the study.

If you need further assistance, you may schedule an appointment at the Cleveland State University Counseling and Testing Center by calling (216) 687-2277.

Participation in this study is completely voluntary and you may withdraw at any time. If you have any questions regarding this research, feel free to contact Kim Thomas at (216) 548-2983 or email her at k.d.thomas64@csuohio.edu, or call Dr. Conor T. McLennan at (216) 687-3750 or email him at c.mclennan@csuohio.edu.

There are two copies of this consent form. After signing them, keep one for your own records and return one to the researcher. Thank you in advance for participating in our research study. Please indicate your consent to participate by signing below.

"I am 18 years old or older and have read and understood this consent form. I voluntarily agree to participate in this study."

"If I have any questions about my rights as a research participant I can contact the Cleveland State University Institutional Review Board at (216) 687-3630."

Signature: _____

Name: _____ (Please Print)

DATE: _____

APPENDIX G
(Instructions for Emotion Recognition Pilot Part 1)

Language Research Laboratory
Chester Building Room 249

Welcome to the Language Research Laboratory. We appreciate your helping us today. In this experiment that you will be participating in today, you will view a series of faces, and you will be asked to identify the emotion you believe each face is expressing.

A typical trial will proceed as follows:

A picture will appear on the screen and a textbox will appear below the picture. After you have had a chance to view the picture, please use the keyboard and type the emotion in the textbox you believe the face is expressing.

As soon as you have responded, a new trial will begin.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX H
(Example of Emotion Recognition Pilot Part 1)

Please use the keyboard to type the emotion in the textbox you believe the face is expressing. Once you have completed your response, and you are sure your response is correct, click NEXT to proceed to the next trial. Pressing ENTER will NOT allow you to proceed to the next trial.

A happy face was shown, but has been removed to protect the identity of the participant.

Next >

APPENDIX I
(Instructions for Emotion Recognition Pilot Part 2)

For part two, you will view a series of faces, and you will be asked to identify the emotion you believe each face is expressing.

A typical Trial will proceed as follows:

A picture will appear on the computer screen, with a list of answer choices above the image. After you have had a chance to look at the picture, please select the emotion you believe that the face is expressing using the button box. To use the button box, select the colored button that matches the emotion you want to choose. For example, if the image is expressing happiness, and above the image it states, HAPPY = GREEN, then you would press the green button.

As soon as you have responded, a new trial will begin.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX J
(Example of Emotion Recognition Pilot Part 2)

Please use the button box to indicate the emotion:

Red = Angry

Yellow = Surprised

Blue = Sad

Green = Happy

A happy face was shown, but has been removed to protect the identity of the participant.

APPENDIX K
(Informed Consent for Experiment Part 1)

**Informed Consent
Online Portion (PART ONE)
Participant Consent Form**

This research is being conducted by Kim Thomas as part of her thesis project for her Master's degree from the Psychology Department at Cleveland State University under the direction of her thesis advisor, Dr. Conor T. McLennan. Contact information for both Kim and Dr. McLennan appear below.

The purpose of this research is to identify the effects of contemporary mass media images. This is a two-part experiment. As a participant in Part One, you will be asked to complete a short questionnaire online. Once, you are finished, please sign up for a time to come to the lab to complete Part Two of the experiment. Part One should take no longer than 30 minutes to complete. Please be aware that you are not required to participate in this research, and you may discontinue your participation at any time without penalty. You may also omit any items on the questionnaire that you prefer not to answer.

We will do our best to keep your responses to this survey confidential. At no time during this survey will you be asked for your name. To begin the survey, you are asked to provide your name as a way to consent to the survey, however, once you submit your name, you will be directed to a new window to fill out the survey. These two surveys will not be linked. You will need to include your CSU ID number in order to link your responses from this survey to your responses from PART TWO. Once your responses have been linked, you will be assigned a Participant ID number. Your responses will be stored on a password-protected computer, by your participant ID number. Therefore, the confidentiality of your identity will be maintained at all times.

Survey monkey, which is the website in which you are filling out this survey, includes a number of safeguards to keep your information confidential. The website utilizes an SSL encryption in order to keep the information sent across the Internet confidential. Additionally, when you fill out this survey, Survey monkey will hide your computer's IP address. For more information about how survey monkey keeps your responses confidential and secure you can visit help.surveymonkey.com/app/answers/detail/a_id/345/~review-the-potential-irb-guidelines-for-using-surveymonkey-as-a-tool-to-survey.

Risk associated with participation in this study is minimal and not beyond that of daily living. Potential risks include fatigue and possible discomfort from disclosing personal information. If you become tired, feel free to take as long as necessary to complete the survey.

If you need further assistance, you may schedule an appointment at the Cleveland State University Counseling and Testing Center by calling (216) 687-2277.

Participation in this study is completely voluntary and you may withdraw at any time. If you have any questions regarding this research, feel free to contact Kim Thomas at (216) 548-2983 or email her at k.d.thomas64@csuohio.edu, or call Dr. Conor T. McLennan at (216) 687-3750 or email him at c.mclennan@csuohio.edu.

"I am 18 years old or older and I voluntarily agree to participate in this study. My completion and electronic submission of this survey will serve as my consent. I may print a copy of this consent statement for future reference."

"If I have any questions about my rights as a research participant I can contact the Cleveland State University Institutional Review Board at (216) 687-3630."

Signature: _____

APPENDIX L
(Online Questionnaire)

This research is being conducted by Kim Thomas as part of her thesis project for her Master's degree from the Psychology Department at Cleveland State University under the direction of her thesis advisor, Dr. Conor T. McLennan. If you have any questions regarding this research, feel free to contact Kim Thomas at (216) 548-2983 or email her at k.d.thomas64@csuohio.edu, or call Dr. Conor T. McLennan at (216) 687-3750 or email him at c.mclennan@csuohio.edu.

We will do our best to keep your information confidential. All data will be stored in a password-protected computer. To help protect your confidentiality, the surveys will not contain information that will personally identify you.

1. CSU ID _____
2. Date of Birth _____
3. Gender _____
4. Grade level (choose one)
 - A. Freshman
 - B. Sophomore
 - C. Junior
 - D. Senior
5. Major _____
6. What is your race/ethnicity?
 - A. Hispanic
 - B. African American
 - C. Asian American
 - D. White/Caucasian
 - E. American Indian
 - F. European American
 - G. Other _____
7. Please indicate your dominant hand,
 - A. Right Handed
 - B. Left Handed
 - C. No Preference
8. Is English your native Language?
 - A. Yes
 - B. No
9. If no, what is your native language? _____
10. Have you ever been diagnosed with an Eating Disorder?
 - A. Yes
 - B. No
11. If yes, which type of Eating Disorder?
 - A. Anorexia Nervosa
 - B. Bulimia Nervosa
 - C. Other _____

12. If yes, when were you diagnosed with the Eating Disorder? _____
13. If yes, how long have you had the Eating Disorder? _____
14. Are you currently taking any medications? _____
15. Have you ever been in psychotherapy before?
- A. Yes
 - B. No

If yes, please answer the questions below. If you have been in psychotherapy more than one time, please complete information for your most recent two experiences in psychotherapy:

Treatment #1:

15. When did you receive treatment? Please state year _____

16. How effective was it for you?

- A. Not at all
- B. Somewhat
- C. Moderately
- D. Very much so

17. Approximately how many sessions did you attend? Please state # of sessions: _____

18. In addition, please circle the choice that best reflects the number of sessions you attended:

- A. 1-2
- B. 3-5
- C. 6-10
- D. 11-20
- E. 21 or more

19. How would you describe the therapy? _____

Treatment #2:

20. When did you receive treatment? Please state year _____

21. How effective was it for you?

- A. Not at all
- B. Somewhat
- C. Moderately
- D. Very much so

22. Approximately how many sessions did you attend? Please state # of sessions:_____

23. In addition, please circle the choice that best reflects the number of sessions you attended:

- A. 1-2
- B. 3-5
- C. 6-10
- D. 11-20
- E. 21 or more

24. How would you describe the therapy?_____

25. How much do you weigh?_____

26. How tall are you?_____

Please answer the following questions using the rating scale below. Give only one answer for each question

ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
1	2	3	4	5	6

27. I eat sweets and carbohydrates without feeling nervous.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

28. I think that my stomach is too big.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

29. I wish that I could return to the security of childhood.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

30. I eat when I am upset.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

31. I stuff myself with food.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

32. I wish I could be younger.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

33. I think about dieting.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

34. I get frightened when my feelings are too strong.

1.	2.	3.	4.	5.	6.
----	----	----	----	----	----

35. I think that my thighs are too large.
1. 2. 3. 4. 5. 6.
36. I feel ineffective as a person.
1. 2. 3. 4. 5. 6.
37. I feel extremely guilty after overeating.
1. 2. 3. 4. 5. 6.
38. I think that my stomach is just the right size.
1. 2. 3. 4. 5. 6.
39. Only outstanding performance is good enough in my family.
1. 2. 3. 4. 5. 6.
40. The happiest time in life is when you are a child.
1. 2. 3. 4. 5. 6.
41. I am open about my feelings.
1. 2. 3. 4. 5. 6.
42. I am terrified of gaining weight.
1. 2. 3. 4. 5. 6.
43. I trust others.
1. 2. 3. 4. 5. 6.
44. I feel alone in the world.
1. 2. 3. 4. 5. 6.
45. I feel satisfied with the shape of my body.
1. 2. 3. 4. 5. 6.
46. I feel generally in control of things in my life.
1. 2. 3. 4. 5. 6.
47. I get confused about what emotion I am feeling.
1. 2. 3. 4. 5. 6.
48. I would rather be an adult than a child.
1. 2. 3. 4. 5. 6.
49. I can communicate with others easily.
1. 2. 3. 4. 5. 6.

50. I wish I were someone else.
 1. 2. 3. 4. 5. 6.
51. I exaggerate or magnify the importance of my weight.
 1. 2. 3. 4. 5. 6.
52. I can clearly identify what emotion I am feeling.
 1. 2. 3. 4. 5. 6.
53. I feel inadequate.
 1. 2. 3. 4. 5. 6.
54. I have gone on eating binges where I have felt I could not stop.
 1. 2. 3. 4. 5. 6.
55. As a child, I tried very hard to avoid disappointing my parents and teachers.
 1. 2. 3. 4. 5. 6.
56. I have close relationships.
 1. 2. 3. 4. 5. 6.
57. I like the shape of my buttocks.
 1. 2. 3. 4. 5. 6.
58. I am preoccupied with the desire to be thinner.
 1. 2. 3. 4. 5. 6.
59. I don't know what's going on inside me.
 1. 2. 3. 4. 5. 6.
60. I have trouble expressing my emotions to others.
 1. 2. 3. 4. 5. 6.
61. The demands of adulthood are too great.
 1. 2. 3. 4. 5. 6.
62. I hate being less than best at things.
 1. 2. 3. 4. 5. 6.
63. I feel secure about myself.
 1. 2. 3. 4. 5. 6.
64. I think about binging (overeating).
 1. 2. 3. 4. 5. 6.

65. I feel happy that I am not a child anymore.
1. 2. 3. 4. 5. 6.
66. I get confused as to whether or not I am hungry.
1. 2. 3. 4. 5. 6.
67. I have a low opinion of myself.
1. 2. 3. 4. 5. 6.
68. I feel that I can achieve my standards.
1. 2. 3. 4. 5. 6.
69. My parents have expected excellence from me.
1. 2. 3. 4. 5. 6.
70. I worry that my feelings will get out of control.
1. 2. 3. 4. 5. 6.
71. I think my hips are too big.
1. 2. 3. 4. 5. 6.
72. I eat moderately in front of others and stuff myself when they are gone.
1. 2. 3. 4. 5. 6.
73. I feel bloated after eating a small meal.
1. 2. 3. 4. 5. 6.
74. I feel that people are happiest when they are children.
1. 2. 3. 4. 5. 6.
75. If I gain a pound, I worry that I will keep gaining.
1. 2. 3. 4. 5. 6.
76. I feel that I am a worthwhile person.
1. 2. 3. 4. 5. 6.
77. When I am upset, I don't know if I am sad, frightened, or angry.
1. 2. 3. 4. 5. 6.
78. I feel that I must do things perfectly or not do them at all.
1. 2. 3. 4. 5. 6.
79. I have the thought of trying to vomit in order to loose weight.
1. 2. 3. 4. 5. 6.

80. I need to keep people at a certain distance (Feel uncomfortable if someone tries to get too close).
1. 2. 3. 4. 5. 6.
81. I think that my thighs are just the right size.
1. 2. 3. 4. 5. 6.
82. I feel empty inside (emotionally).
1. 2. 3. 4. 5. 6.
83. I can talk about personal thoughts and feelings.
1. 2. 3. 4. 5. 6.
84. The best years of your life are when you become an adult.
1. 2. 3. 4. 5. 6.
85. I think my buttocks are too large.
1. 2. 3. 4. 5. 6.
86. I have feelings I can't quite identify.
1. 2. 3. 4. 5. 6.
87. I eat or drink in secrecy.
1. 2. 3. 4. 5. 6.
88. I think that my hips are just the right size.
1. 2. 3. 4. 5. 6.
89. I have extremely high goals.
1. 2. 3. 4. 5. 6.
64. When I am upset, I worry that I will start eating.
1. 2. 3. 4. 5. 6.

APPENDIX M
(Informed Consent for Experiment Part 2)
Emotion Recognition Task (PART TWO)

This research is being conducted by Kim Thomas as part of her thesis project for her Master's degree from the Psychology Department at Cleveland State University under the direction of her thesis advisor, Dr. Conor T. McLennan. Contact information for both Kim and Dr. McLennan appear below.

The purpose of this research is to identify the effects of contemporary mass media images. This is a two-part experiment. You should have already completed Part One prior to coming to the lab today. As a participant in Part Two, you will be asked to view some images from various advertisements and then complete a short task on the computer. This portion of the experiment should take no longer than 30 minutes to complete. Please be aware that you are not required to participate in this research, and you may discontinue your participation at any time without penalty.

Your responses will be completely confidential. No personal identifying information will be asked at any time during the study. You will need to include your CSU ID number in order to link your responses from today to the survey that you have already filled out online. Once your responses have been linked, you will be assigned a Participant ID number. Your responses will be stored on a password-protected computer, by your participant ID number. Therefore, the confidentiality of your identity will be maintained at all times. This form will be stored in a locked filing cabinet in the lab.

Risk associated with participation in this study is minimal and not beyond that of daily living. Potential risks include fatigue and possible discomfort from disclosing personal information. If you become tired, feel free to take as long as necessary to complete the experiment.

If you need further assistance, you may schedule an appointment at the Cleveland State University Counseling and Testing Center by calling (216) 687-2277.

Participation in this study is completely voluntary and you may withdraw at any time. If you have any questions regarding this research, feel free to contact Kim Thomas at (216) 548-2983 or email her at k.d.thomas64@csuohio.edu, or call Dr. Conor T. McLennan at (216) 687-3750 or email him at c.mclennan@csuohio.edu.

There are two copies of this consent form. After signing them, keep one for your own records and return one to the researcher. Thank you in advance for participating in our research study. Please indicate your consent to participate by signing below.

“I am 18 years old or older and have read and understood this consent form. I voluntarily agree to participate in this study.”

“If I have any questions about my rights as a research participant I can contact the Cleveland State University Institutional Review Board at (216) 687-3630.”

Signature: _____

Name: _____ (Please Print)

CSU ID: _____

DATE: _____

APPENDIX N
(Instructions for **Thin and Overweight Priming Paradigm**)

Language Research Laboratory
Chester Building Room 249

Welcome to the Language Research Laboratory. We appreciate your helping us today.

In the experiment that you will be participating in today, you will be viewing pictures of female models, and you are asked to rate to what extent each model is in accordance with your own perception of ideal female body image on a four-point scale (1 = NOT at all to 4 = VERY much).

A typical trial will proceed as follows:

A picture will appear on the computer screen.

After you have had a chance to look at the picture, a rating scale will appear below the picture. Once the rating scale has appeared, please use the number keys on the keyboard to rate to what extent each model is in accordance with your own perception of ideal female body image on a four-point scale (1=NOT at all to 4 = VERY much).

As soon as you have responded, a new trial will begin.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX O
(Instructions for Car Priming Paradigm)

Language Research Laboratory
Chester Building Room 249

Welcome to the Language Research Laboratory. We appreciate your helping us today.

In the experiment that you will be participating in today, you will see pictures taken from car advertisements. Your task is to rate how much you think each picture is in accordance with your own perception of a good-looking car.

You should make your rating on a scale of 1 to 4, where 1 = NOT at all and 4 = VERY much. Feel free to use any number between 1 and 4 to make your ratings.

A typical trial will proceed as follows:

A picture will appear on the computer screen.

After you have had a chance to look at the picture, a rating scale will appear below the picture. Once the rating scale has appeared, please use the number keys on the keyboard to rate to what extent each car is in accordance with your own perception of a good looking car on a four-point scale (1=NOT at all to 4 = VERY much).

As soon as you have responded, a new trial will begin.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX P
(Example of Priming Paradigm)

THIN IDEAL PRIME



Please rate to what extent this model is in accordance with your own perception of ideal female body image on a four-point scale, where 1 = not at all to 4 = very much.

1
not at all

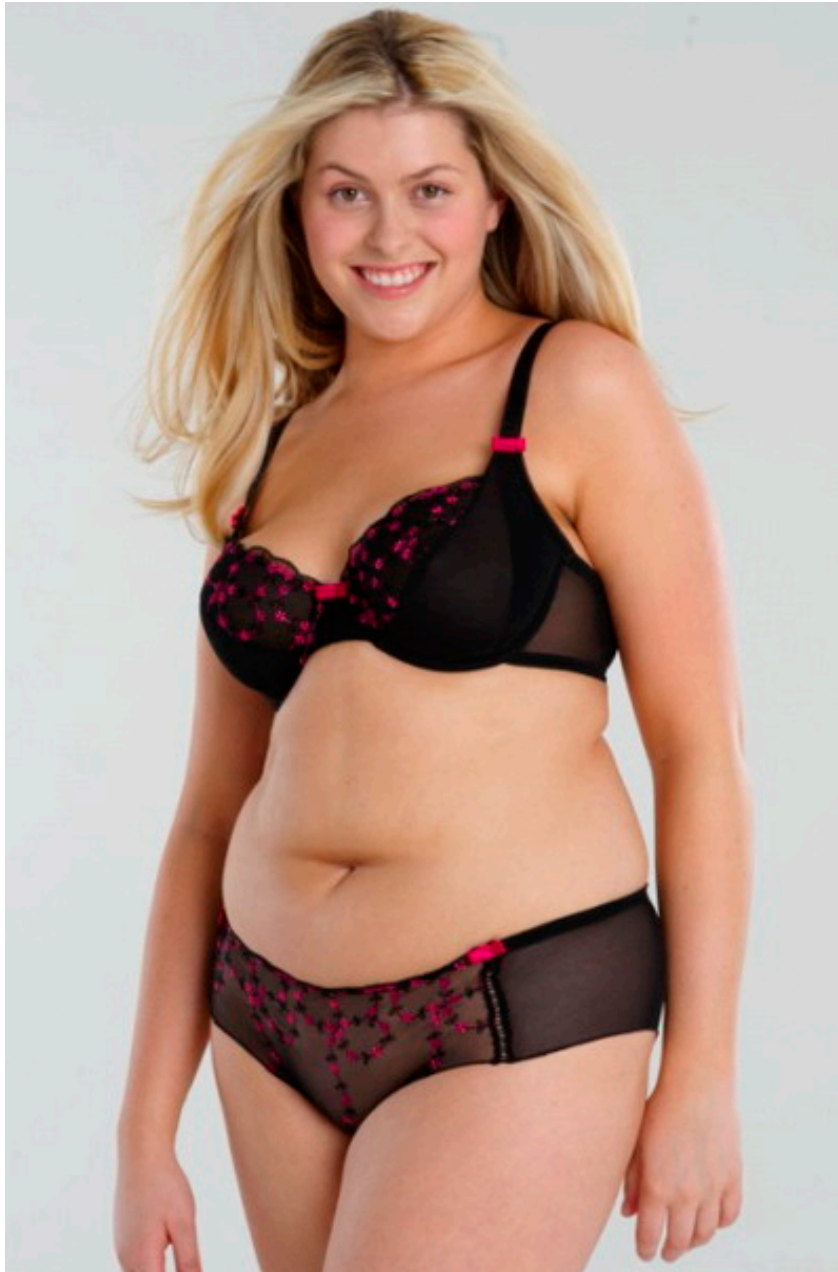
2
very little

3
somewhat

4
very much

APPENDIX Q
(Example of Priming Paradigm)

OVERWEIGHT PRIME



Please rate to what extent this model is in accordance with your own perception of ideal female body image on a four-point scale, where 1 = not at all to 4 = very much.

1
not at all

2
very little

3
somewhat

4
very much

APPENDIX R
(Example of Priming Paradigm)

CAR PRIME (CONTROL)



Please rate to what extent this car is in accordance with your own perception of a good-looking car on a four point scale, where 1 = not at all to 4 = very much.

1
not at all

2
very little

3
somewhat

4
very much

APPENDIX S
(Instructions for Emotion Recognition Task Version 1)

Welcome to the Language Research Laboratory. We appreciate your helping us today.

In the experiment you will be participating in today, you will view a series of faces, and you will be asked to identify the emotion you believe each face is expressing.

A typical trial will proceed as follows:

A picture will appear on the computer screen, with a list of answer choices above the image. After you have had a chance to look at the picture, please select the emotion you believe that the face is expressing using the button box. To use the button box, select the colored button that matches the emotion you want to choose. As Follows:

RED = ANGRY YELLOW = SURPRISE BLUE = SAD GREEN = HAPPY

As soon as you have responded, a new trial will begin.

There will be a short practice to familiarize you with the experiment.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX T
(Instructions for Emotion Recognition Task Version 2)

Welcome to the Language Research Laboratory. We appreciate your helping us today.

In the experiment you will be participating in today, you will view a series of faces, and you will be asked to identify the emotion you believe each face is expressing.

A typical trial will proceed as follows:

A picture will appear on the computer screen, with a list of answer choices above the image. After you have had a chance to look at the picture, please select the emotion you believe that the face is expressing using the button box. To use the button box, select the colored button that matches the emotion you want to choose. As Follows:

GREEN = HAPPY RED = ANGRY YELLOW = SURPRISE BLUE = SAD

As soon as you have responded, a new trial will begin.

There will be a short practice to familiarize you with the experiment.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX U
(Instructions for Emotion Recognition Task Version 3)

Welcome to the Language Research Laboratory. We appreciate your helping us today.

In the experiment you will be participating in today, you will view a series of faces, and you will be asked to identify the emotion you believe each face is expressing.

A typical trial will proceed as follows:

A picture will appear on the computer screen, with a list of answer choices above the image. After you have had a chance to look at the picture, please select the emotion you believe that the face is expressing using the button box. To use the button box, select the colored button that matches the emotion you want to choose. As Follows:

BLUE = SAD GREEN = HAPPY RED = ANGRY YELLOW = SURPRISE

As soon as you have responded, a new trial will begin.

There will be a short practice to familiarize you with the experiment.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX V
(Instructions for Emotion Recognition Task Version 4)

Welcome to the Language Research Laboratory. We appreciate your helping us today.

In the experiment you will be participating in today, you will view a series of faces, and you will be asked to identify the emotion you believe each face is expressing.

A typical trial will proceed as follows:

A picture will appear on the computer screen, with a list of answer choices above the image. After you have had a chance to look at the picture, please select the emotion you believe that the face is expressing using the button box. To use the button box, select the colored button that matches the emotion you want to choose. As Follows:

YELLOW = SURPRISE BLUE = SAD GREEN = HAPPY RED = ANGRY

As soon as you have responded, a new trial will begin.

There will be a short practice to familiarize you with the experiment.

If you have any questions, please ask the experimenter now.

Let the experimenter know when you are ready to begin the experiment.

Thank you.

APPENDIX W
(Example of Emotion Recognition Task)

Please use the button box to indicate the emotion:

Red = Angry

Yellow = Surprised

Blue = Sad

Green = Happy

An angry face was shown, but has been removed to protect the identity of the participant.