Forming Implementation Intentions: A Novel Strategy for Overcoming the Negative Impact of Social Comparisons on Body Satisfaction

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Abstract

Body dissatisfaction is associated with significant negative psychological consequences. The purpose of the present study was to determine whether forming implementation intentions, a powerful strategy for modifying behaviors and attitudes through implicit processes, could improve body satisfaction. Participants ($N = 619$) were exposed to highly attractive versus less attractive targets and formed implementation intentions geared at either avoiding appearance-based social comparisons or at maintaining a positive body-image, or did not form implementation intentions. Whereas control participants demonstrated comparison-induced deficits in body satisfaction and self-esteem, these effects were not observed for participants who formed implementation intentions. The social comparison manipulation had no effect on an implicit measure of body satisfaction. However, the body-image implementation intention had a positive impact on implicit body satisfaction. Limitations and implications for future research are discussed.
Forming Implementation Intentions: A Novel Strategy for Overcoming the Negative Impact of Social Comparisons on Body Satisfaction

Body dissatisfaction refers to negative evaluations of aspects of one’s body, such as one’s weight or shape (Stice & Shaw, 2002), and is associated with depression (Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006; Stice & Bearman, 2001; Wiederman & Pryor, 2000), low self-esteem (Cash & Pruzinsky, 2002; van den Berg, Mond, Eisenberg, Ackard, & Neumark-Sztainer, 2010), social anxiety (Cash & Flemming, 2002a), and diminished quality of life (Cash & Fleming, 2002b). Further, body dissatisfaction is a major risk factor for eating disorders (Cooley, & Toray, 2001; Stice, 2002; Stice & Shaw, 2002). Considering the associations between body dissatisfaction and negative psychological outcomes, it is important to identify factors that contribute to body dissatisfaction that can be targeted in prevention and intervention efforts. The current research focuses on a process that plays a key role in the development and maintenance of body dissatisfaction: social comparison.

Social Comparison

Social comparison is the process by which individuals assess their progress and standing in life by comparing themselves to other people (Festinger, 1954). There are two types of social comparison: downward and upward. Downward comparisons occur when individuals compare themselves to others whom they perceive as being “worse off” in some domain. In contrast, upward comparisons occur when individuals compare themselves to those whom they perceive as being “better off.” Upward comparisons may threaten self-concept and produce negative consequences such as decreased self-esteem (Festinger, 1954).
Engaging in social comparisons, particularly upward comparisons related to physical appearance, is associated with greater body dissatisfaction and eating disturbances (Cattarin, Thompson, Thomas, & Williams, 2000; Corning, Krumm, & Smitham, 2006; Dittmar & Howard, 2004; Stormer & Thompson, 1996; Myers & Crowther, 2009; Tiggemann, Polivy, & Hargreaves, 2009; Want, 2009). Additionally, social comparison is thought to be the mechanism underlying the effects of thin-ideal models on body satisfaction (Dijkstra, Gibbons, Buunk, 2010; Tiggeman & Slater, 2004). When comparing themselves to thin-ideal models, women may perceive a discrepancy between socially prescribed standards of attractiveness and their own appearance. This may cause them to evaluate themselves negatively in return, and thus experience body dissatisfaction (Strahan, Wilson, Cressman, & Buote, 2006). It is important to note, however, that the effects of social comparison on body satisfaction are not exclusive to comparison targets in the media, such as models or celebrities. Rather, comparing oneself with peers is also associated with increased body dissatisfaction (Bamford & Halliwell, 2009; Heinberg & Thompson, 1992; Myers & Crowther, 2009; Stormer & Thompson, 1996; Trottier, Polivy, & Herman, 2007).

Body satisfaction interventions that target social comparisons have been shown to produce positive outcomes. These interventions have taken different approaches to mitigating the effects of social comparisons, such as decreasing the tendency to make comparisons (Posavac, Posavac, & Weigel, 2001), changing the motive for those comparisons (Halliwell & Dittmar, 2005), changing the standard of comparison itself (Martijn, et al. 2012), and changing the comparison domain (Lew, Mann, Myers, Taylor, & Bower, 2007). For example, Lew and colleagues (2007) gave participants writing prompts
that encouraged them to compare themselves to models along a non-appearance domain, such as talents or friendships. They found that participants in the intervention condition experienced greater body satisfaction, less appearance-related anxiety, and less desire to lose weight than control participants (Lew et al., 2007). The current study aims to build upon this strategy by changing the domain of comparison to body functionality, a non-appearance, but body-related domain. Body functionality refers to the many things that the body can do, including physical activity and movement, biological processes, and interaction with others (Alleva, Martijn, Jansen, & Nederkoorn, 2014). Focusing on body functionality has been shown to improve body satisfaction and appreciation, and decrease self-objectification (Alleva, Martijn, Van Breukelen, Jansen, & Karos, 2015). Thus, by directing participants’ focus away from the appearance of comparison targets and instead emphasizing other aspects of the body and self, we hope to prevent body dissatisfaction and encourage participants to adopt a more holistic view of bodies.

**Improving Body Satisfaction through Automatic Processes**

Most body image interventions to date primarily operate on the reflective learning system, one that works through conscious reasoning (Martijn, Alleva, & Jansen, 2015). Recently, however, intervention research has started to explore strategies that target the automatic system, one that learns through nonconscious associations (Martijn, Alleva, & Jansen, 2015). These novel strategies achieve their effects by taking advantage of automatic processes involved in body evaluations, such as attentional and conditioning processes (Martijn, Alleva, & Jansen, 2015). For example, Martijn et al. (2012) used an evaluative conditioning paradigm to make thin-ideal models less desirable targets for comparison. By breaking participants’ implicit associations between thin-ideal models and positive
qualities, the researchers found that participants experienced improvements in body satisfaction (Martijn et al., 2012). In addition to the above strategy, improvements in body satisfaction have been achieved by disrupting associations between individuals’ bodies and negative body-related thoughts (Jansen et al., 2008), as well as by teaching women to associate their bodies with positive social stimuli (Martijn, Vanderlinden, Roefs, Huijding, & Jansen, 2010). Given the success of these interventions, we seek to expand upon this area of research by exploring the potential of another strategy that has been shown to change thoughts, behaviors, and feelings through implicit processes: forming “if-then” plans, or implementation intentions.

**Forming Implementation Intentions: A Novel Strategy to Improve Body Satisfaction**

Implementation intentions are plans that spell out when, where, and how an individual will accomplish a desired goal (Gollwitzer, 1999). These plans take the format: “If situation X occurs, then I will perform goal-directed response Y!” (Gollwitzer, 1999). For example, if an individual intends to start eating more fruits, then they might form the plan, “If I find myself getting hungry in between meals, then I will eat an apple!” Implementation intentions heighten the mental accessibility of opportunities for goal striving (specified in the if- component of the plan) and form strong links between these opportunities and goal-directed responses (specified in the then- component of the plan) (Webb & Sheeran, 2008). The result is that goal striving becomes relatively automatic, such that when the situational cue is encountered, the response is enacted quickly and without conscious effort (Sheeran, Webb, & Gollwitzer, 2005). Because the effects of implementation intentions are produced by their if-then structure, these plans may be applied to a wide variety of situations and goals (Gollwitzer & Sheeran, 2006; Webb & Sheeran, 2008).
There is some evidence to suggest that implementation intentions could effectively alter the social comparison process. Implementation intentions have been used to effectively control attention responses in various contexts (Achtziger, Gollwitzer, & Sheeran, 2008; Mendoza, Gollwitzer, & Amodio, 2010; Parks-Stamm, Gollwitzer, & Oettingen, 2010; Palaiwa, Sheeran, & Thompson, 2010; Schweiger-Gallo et al., 2009; Sheeran, Aubrey, & Kellett, 2007; Webb, Ononaiye, Sheeran, Reidy, & Lavda, 2010). For example, Palaiwa, Sheeran, and Thompson (2010) found that forming implementation intentions allowed participants to effectively ignore stigmatizing appearance-related comments, such that these participants did as well on an attention test as participants who did not hear the comments at all. A similar implementation intention could be applied to the domain of social comparison. By forming plans to ignore the appearance of comparison targets and instead attend to a domain unrelated to appearance (e.g., body functionality), participants may protect themselves from resultant body dissatisfaction.

Although there is evidence that changing the domain of social comparisons can improve body satisfaction (Lew et al., 2007), it might be beneficial to implement an additional strategy that operates separately from the comparison process in some circumstances, such as when social comparisons have already occurred. In this case, another approach to improving body satisfaction might be to form an implementation intention that targets negative appearance-related evaluations directly – by replacing them with positive thoughts about the self. An implementation intention specifying when, where, and how one will offer positive self-evaluations could result in these thoughts becoming relatively automatic. These positive thoughts may then replace habitual negative body thoughts that characterize and maintain body dissatisfaction (Verplanken, & Velsvik,
2008). Research demonstrating that implementation intentions effectively override habitual responses, such as implicit attitudes (Stewart & Payne, 2008; Tidswell, Sheeran, & Webb, 2011; Webb, Sheeran, & Pepper, 2012) and emotional reactivity (Schweiger Gallo et al., 2009), supports this notion. Thus, there are multiple means through which forming implementation intentions may protect and improve body satisfaction; one strategy may involve targeting processes that contribute to body dissatisfaction (e.g., social comparison), while another route may involve directly altering the ways in which individuals think about themselves and their bodies.

The Current Study

Prior research on interventions that improve body image through automatic processes, as well as research demonstrating the versatility of implementation intentions, suggests that forming implementation intentions may be a useful strategy for improving body satisfaction. Thus, the current study aims to explore this novel application of implementation intentions. Specifically, we aim to determine whether forming implementation intentions can negate the effects of appearance-related social comparisons on body satisfaction. Female participants will be induced to make upward appearance-related comparisons via exposure to images of highly attractive women (i.e., thin-ideal models). According to prior research on the effects of thin-ideal models (Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002), we anticipate that this procedure will engender body dissatisfaction. We will test the effects of two implementation intentions on this comparison-induced body dissatisfaction. The first implementation intention (social comparison plan) will target the social comparison process by changing the domain of comparison from appearance to body functionality. The second implementation intention
(body image plan) will not influence the comparison process, but rather, will target body dissatisfaction directly by encouraging positive self-thoughts to take the place of negative appearance-related evaluations. We will utilize both an explicit and an implicit measure of body satisfaction. While most studies measure body satisfaction explicitly, typically by self-report, there is evidence to suggest that body dissatisfaction also includes an automatic component (Verplanken, & Tangelder, 2011). We hypothesize that forming implementation intentions will negate the effect of social comparison on body satisfaction. Specifically, we expect that participants who form implementation intentions will overcome comparison-induced deficits in body satisfaction and experience greater body satisfaction relative to control participants.

**Method**

**Participants**

Female participants ($N = 619$) were recruited from Amazon Mechanical Turk (MTurk), a website through which individuals can earn money by completing online tasks. Participants who were less than 18 years of age, male, or literate in Chinese were excluded from this study. The language criterion was necessary due to the nature of one of our measures, the Affect Misattribution Procedure, which uses Chinese characters as ambiguous stimuli. Average participant age was 36.77 years with a large amount of variability (SD = 12.49). The majority of the sample was white (84.5%) and non-Hispanic (93.5%).

**Measures**

**Implicit Appearance Satisfaction.** We measured appearance satisfaction (a more general component of body satisfaction) via a modified version of the Affect Misattribution
Procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005). The AMP is one of the most widely used and psychometrically supported measures of implicit attitudes (Payne & Lundberg, 2014). During the AMP, prime stimuli are presented briefly, but not subliminally. These primes are followed by a target, which is then followed by a visual mask. It is standard practice to use Chinese characters as targets, as they are sufficiently ambiguous to people who cannot read them and, therefore, do not elicit any particular judgments. The subjects’ task is to judge the Chinese characters on a binary response scale (e.g., Pleasant/Unpleasant, Attractive/Unattractive, etc.). Importantly, they are instructed to ignore the primes and not let them bias their judgments of the characters. Thus, any effects of the primes on participants’ judgments occur regardless of conscious intentions (i.e., are automatic). The idea is that if participants are primed with pleasant images, then they will unintentionally tend to rate the Chinese characters as pleasant, and vice versa with unpleasant primes. These effects result from participants misattributing their automatic evaluations of the primes to the Chinese characters.

In the current study, we used four words related to the concept of “self” as experimental primes (Me, I, Myself, and Self) and four words related to the concept of “other” as a control category (They, Them, Other, and Others). Participants were instructed to rate the Chinese characters as either “Attractive” or “Unattractive.” We expected that participants’ evaluations of their own attractiveness would be reflected in their judgments of the characters. Prior to the experimental trials, participants received four practice trials with unrelated pleasant (Lovely, Fun) and unpleasant (Nasty, Awful) words as primes. They responded to these trials on a Pleasant/Unpleasant scale. AMP scores were created by computing the proportion of positive responses (the number of trials participants indicated
the target was attractive) out of overall responses. This was done for both trials preceded by “self” stimuli and trials preceded by “other” stimuli, yielding two sets of scores. Participants were excluded from data analysis if they gave the same response on all trials, according to prior recommendations (Payne & Lundberg, 2014).

**Body Satisfaction.** Participants completed the Body Image States Scale (BISS), a standard measure of body satisfaction (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002). The scale consists of 6 items that assess individuals’ evaluations of their physical appearance in the present moment. Responses are made on 9-point, bipolar, Likert scales. Several items are reverse coded and then the mean of all items is taken to create a composite score, with higher scores indicating greater body satisfaction. In the same manner as Martijn et al. (2012), we found that one item had a weaker item-total correlation compared to the other items (item-total \( r = .576 \)) and, therefore, was discarded prior to averaging the items. Reliability of the 5-item BISS was high (\( \alpha = .89 \)). The construct validity of the BISS has been experimentally supported and the BISS has proven to be appropriately correlated with other measures of body image (Cash et al., 2002).

**Self-esteem.** In addition to our body satisfaction measures, we also examined the effects of implementation intentions on self-esteem, which is correlated with body satisfaction (van den Berg, Mond, Eisenberg, Ackard, & Neumark-Sztainer, 2010; Wichstrøm, & von Soest, 2016) and may also be affected by social comparison (Vogel, Rose, Roberts, & Eckles, 2014). We measured self-esteem via the Single-Item Self-Esteem Scale (SISE; Robins, Hendin, & Trzesniewski, 2001). The SISE consists of the item “I have high self-esteem” and is rated on a 1 (Not very true of me) to 5 (Very true of me) scale, with higher scores indicating greater self-esteem. The SISE was designed as an alternative to the
Rosenberg Self-Esteem Scale (Rosenberg, 1965) and has been shown to have adequate reliability and validity (Robins et al., 2001).

**Procedure**

The experiment followed a 2 (social comparison target: attractive vs. average) x 3 (implementation intention: social comparison plan vs. body image plan vs. control) between-subjects design. The order in which participants experienced the two manipulations differed according to the level of the implementation intention manipulation to which they were randomly assigned. Participants who were assigned to form the social comparison plan did so prior to the social comparison manipulation, whereas participants assigned to form the body image plan did so after this manipulation. Control implementation intention participants did not form a plan and underwent only the social comparison manipulation. The purpose of these variations in procedure was to accommodate the different implementation intention strategies. The social comparison plan was designed to alter the social comparison process and, thus, was formed prior to this process. In contrast, the body image plan was proposed as a method of reversing body dissatisfaction after comparison occurs. We decided that having participants form the body image plan after the social comparison manipulation would better demonstrate that this plan operates independently of the comparison process (i.e., on the outcome of comparison, body dissatisfaction itself).

The experiment was designed and administered using Qualtrics survey software. Upon visiting the Qualtrics link, participants provided consent and were screened out according to the exclusion criteria stated previously. The remaining eligible participants were then randomly assigned to one of three levels of the implementation intention.
manipulation, which also determined the order in which participants received the experimental manipulations. Participants were also randomly assigned to view either attractive (experimental) or average (control) social comparison targets, creating a total of six conditions. Each component of this experiment is described in detail below.

**Social Comparison Manipulation**

Participants completed a task in which we manipulated the attractiveness of comparison targets in order to encourage appearance-related social comparisons. Images of women in swimwear were used as stimuli in this procedure. Forty-four images were gathered from swimwear retailer websites and piloted in a sample of 30 female MTurk users, who rated the physical attractiveness of the women on a 9-point scale. The mean rating was calculated for each image and the 12 highest and 12 lowest rated images were selected for use in this study. The 12 lowest ratings tended to fall toward the middle of the scale, indicating that the women in these images were perceived as average-looking, rather than unattractive ($M = 4.63$, $SD = 1.50$). A paired samples t-test revealed that the mean rating of the attractive stimuli ($M = 7.15$, $SD = 1.13$) was significantly higher than the mean rating of the average stimuli, $t(29) = 9.16$, $p < .001$.

Participants were presented with three groups of four images. For each image group, they were asked to choose “which body is best”, and then justify their answer. The wording of these instructions was intentionally vague so that participants who formed a social comparison plan prior to this task could compare along the domain of either appearance or body functionality. Participants were randomly assigned to either the experimental condition, in which they viewed the attractive stimuli, or the control condition, in which they viewed the average stimuli.
Implementation Intention Manipulation

Social comparison plan. Prior to the social comparison manipulation, some participants were asked to form the implementation intention: “When I view the bodies, I will ignore how they look and I will think about how well these bodies function!” They were asked to repeat this plan to themselves three times and fully commit themselves to carrying it out. Participants were unable to continue until 30 seconds had passed in order to encourage them to follow through with these instructions. On the next page, participants were asked to type their plan into a text box as a manipulation check. Participants were also asked to rate how committed they were to carrying out their plan on a 1 (Not at all committed) to 7 (Very committed) scale. The purpose of this item was to demonstrate that any differences observed between the implementation intention conditions could not be explained by differences in motivation.

Body image plan. The procedure for participants who formed a body image plan was similar to that described above, except with regard to the order of the manipulations and the specific wording of the implementation intention. After they completed the social comparison task, these participants were asked to form the implementation intention: “If I have the opportunity to view myself positively, then I will take it!” All other aspects of the study procedure remained the same.

Control. These participants did not receive instructions to form an implementation intention. All other aspects of the study procedure remained the same.

Affect Misattribution Procedure

After the experimental manipulations, all participants completed the AMP as a measure of their implicit appearance satisfaction. Participants were told that they would
complete a task that assessed “how people make simple judgments.” They were told that they would see a word flash on the screen, followed immediately by the flash of a Chinese character. For the practice trials, they were told that their job was to judge the visual pleasantness of the Chinese character. They indicated their judgments by pressing either the “Q” key, representing “Unpleasant,” or the “P” key, representing “Pleasant.” Once they completed these trials, they were informed that their task had changed, and that it was now their job to judge the attractiveness of the Chinese character ($Q = \text{Unattractive}; P = \text{Attractive}$). Critically, participants received the following instructions: “It is important to note that the word can sometimes bias people’s judgments of the abstract image. Because we are interested in how people can avoid being biased, please try your absolute best not to let the word bias your judgment of the abstract images! Give us an honest assessment of the abstract images, regardless of the words that precede them.” During each trial, the prime word was presented for 200 milliseconds (ms), followed by a blank screen for 100 ms, and then a Chinese character for 200 ms. After the character, a visual mask appeared on the screen until the participant responded. The intertrial intervals lasted 400 ms.

Participants completed a total of 108 trials (4 practice trials and 104 experimental trials), presented in random order. Each of the 8 experimental prime words (words related to “self” and “other”) was shown 13 times. Fifty-six unique Chinese characters were used as the targets, four of which were used only in the practice trials. Each of the remaining fifty-two experimental characters was randomly paired with a “self” prime word and an “other” prime word, such that a character was seen once for each prime category. Participants took approximately 6 minutes to complete this procedure.
Self-report Questionnaires

Finally, participants completed the BISS and the SISE in a counter-balanced order and concluded the survey with several demographic questions. They were then debriefed and given a survey code to enter into MTurk to prove participation and receive their compensation.

Results

Body Satisfaction

To test our hypothesis that implementation intentions would negate the effects of comparison target on body satisfaction, we ran a two-way ANOVA including implementation intention condition and comparison target as predictors and BISS scores as the outcome. There was no main effect of comparison target, $F(1,613) = 2.34, p = .126$, $\eta^2 = .004$, or condition, $F(2,613) = 2.26, p = .105, \eta^2 = .007$, and no interaction effect, $F(2,613) = 1.10, p = .333, \eta^2 = .004$. However, given the pattern of means (Table 1), and our specific prediction concerning the impact of comparison target for each condition, we conducted a planned comparison analysis by splitting the data file by condition and then running an independent samples t-test to test the effect of comparison target. Our analysis revealed a significant effect of comparison target in the control condition, $t(212) = 2.24, p = .026$, such that participants exposed to the attractive comparison targets demonstrated lower body satisfaction than those exposed to the average-looking targets. In line with our hypothesis, this effect was not seen in either the social comparison plan, $t(193) = .43, p = .665$, or the body image plan conditions, $t(208) = .14, p = .889$. These findings suggest that, according to our hypothesis, forming implementation intentions blocked the impact of social comparison on body satisfaction.
Self-esteem

We conducted similar analyses to test whether implementation intentions would block any effects of comparison target on self-esteem (Table 2). Two-way ANOVA revealed a marginal effect of comparison target on SISE scores, such that participants exposed to the attractive targets had lower self-esteem, $F(1, 613) = 2.88, p = .09, \eta^2 = .005$. Again, there was no main effect of condition, $F(2, 613) = .20, p = .816, \eta^2 = .001$, and no interaction, $F(2, 613) = 1.36, p = .257, \eta^2 = .004$. Planned comparisons showed that there was a significant effect of comparison target on self-esteem in the control condition, such that participants who viewed the attractive targets reported lower self-esteem, $t(212) = 2.34, p = .02$. Again, this effect was not observed in either the social comparison plan, $t(193) = .01, p = .989$, or body image plan, $t(208) = .64, p = .52$, condition, suggesting that forming implementation intentions blocked the impact of social comparison on self-esteem.

Implicit Appearance Satisfaction

To test our hypothesis that implementation intentions would counteract the effects of comparison on appearance satisfaction, we compared the proportion of positive responses to “self” targets across conditions while controlling for the overall tendency to respond to stimuli positively. We did this by conducting a two-way ANCOVA with the proportion of positive responses on “other” target trials as the covariate (Table 3). There was no significant main effect of comparison target, $F(1, 613) = .71, p = .401, \eta^2 = .001$, or interaction, $F(2, 613) = .07, p = .937, \eta^2 = .00$. However, we found a significant effect of implementation intention condition on the proportion of positive responses to “self” targets, $F(2, 613) = 8.28, p < .001, \eta^2 = .026$. To identify differences between conditions, we dummy coded this variable to create three new variables, each comparing a pair of
conditions (e.g., variable 1 = social comparison plan vs. body image plan, etc.). We then ran three additional ANCOVAs. When comparing the two implementation intentions, there was a significant effect of condition, such that participants who formed the body image plan rated a greater proportion of “self” targets as attractive than those who formed the social comparison plan, $F(1, 400) = 7.32, p = .007, \eta^2 = .018$. When examining the social comparison plan compared to the control condition, we found no effect, meaning that the appearance satisfaction of participants who formed the social comparison plan did not differ from that of control participants, $F(1, 405) = .14, p = .705, \eta^2 = .00$. Finally, when comparing the body image plan to the control condition, we found that there was an effect of condition, such that participants who formed the body image plan had a significantly greater proportion of positive scores on “self” trials than those who formed the social comparison plan, $F(1, 420) = 12.99, p < .001, \eta^2 = .03$. These results suggest that the body image plan improves implicit appearance satisfaction, such that participants who formed the body image plan rated a greater proportion of “self” targets as attractive compared to participants who formed the social comparison plan and those who did not form an implementation intention.

**Discussion**

The current study sought to determine whether forming implementation intentions would block the impact of appearance-related social comparisons on body satisfaction, measured both explicitly and implicitly, as well as self-esteem. We hypothesized that implementation intentions would negate the effects of social comparison on body satisfaction, such that comparison-induced deficits in body satisfaction would not be observed among participants who formed implementation intentions. We expected to see
similar results for self-esteem. Our hypotheses were largely supported. Although we did not find an effect of comparison target on implicit appearance satisfaction, we did find an effect of implementation intention condition, such that participants who formed the body image plan showed greater implicit appearance satisfaction than the other two conditions. Thus, although the body image plan did not have an effect on comparison-induced appearance dissatisfation, it nonetheless increased appearance satisfaction for these participants. We also found that control participants who were exposed to the attractive comparison targets had lower explicit body satisfaction and self-esteem than those who were exposed to the average-looking targets. These differences were not observed among participants who formed either implementation intention, suggesting that, in support of our hypothesis, implementation intentions blocked the effects of social comparison on body satisfaction and self-esteem.

Interestingly, though our manipulation of comparison target influenced scores on the explicit measures, this effect was not seen on our implicit measure of appearance satisfaction. This lack of effect may explain why the participants who formed the social comparison plan did not differ from control participants in appearance satisfaction, as there was seemingly no comparison-induced deficit to act upon. However, the reason we observed this discrepancy between implicit and explicit measures remains open to interpretation. It may be that the strength of our comparison manipulation was insufficient to affect body satisfaction at the implicit level. Perhaps a more visceral, self-threatening experience, such as a comparison situation involving a confederate, or a situation juxtaposing the comparison target with the participant’s own self-image, is needed to create deficits in implicit body satisfaction. Another possibility is that our manipulation did
not sufficiently engage the processes that contribute to implicit evaluations (Gawronski, & Bodenhausen, 2006). Regardless of the lack of effect of comparison target, we have evidence that the body image plan has a positive impact on implicit appearance satisfaction, as indicated by the greater proportion of positive AMP scores in this condition compared to controls. This result shows that this plan, as originally intended, operates on body satisfaction independent of the social comparison process.

This study makes two major contributions to the literature. First, although previous studies have measured body satisfaction implicitly (Verplanken, & Tangelder, 2011), the present study is the first study to our knowledge that has modified implicit body satisfaction. This finding opens up questions regarding the characterization of this construct, such as whether the same factors that influence explicit body satisfaction are relevant to implicit body satisfaction, and whether both forms are similarly detrimental to psychological well-being. Depending upon evidence in response to the latter question, researchers may reconsider the standard methods for assessing body image, which are limited to explicit measures.

The second major contribution of this study is that it demonstrates a novel application of implementation intentions. Although implementation intentions have been applied to a wide variety of situations and goals (Gollwitzer & Sheeran, 2006; Webb & Sheeran, 2008), this is the first study to show that implementation intentions can be utilized to modify social comparison processes and body image. To expand upon the potential utility of these plans as body image interventions, a logical next step would be to determine whether their effects persist over an extended time period - perhaps over the course of several weeks. Several studies have demonstrated that implementation
intentions can be effective when carried out over weeks or months (Gollwitzer & Sheeran, 2006). Still, additional research is needed to confirm that body image-focused implementation intentions share this longevity. Another relevant consideration is whether implementation intentions can improve body satisfaction in individuals with significant body image disturbances, such as clinical eating disorder populations. Initial evidence suggests that implementation intentions are effective strategies to promote goal attainment in people with mental health problems (Toli, Webb, & Hardy, 2016). However, many patients with eating disorders are hesitant to change their behaviors (Clausen, Lübeck, & Jones, 2013), and implementation intentions are likely to work only when individuals are motivated to attain their goals (Sheeran, Webb, & Gollwitzer, 2005). Therefore, forming implementation intentions may be most effective in these populations when this strategy is supplemented by an intervention designed to foster motivation toward treatment and recovery.

In addition to enhancing psychological well-being, implementation intentions that improve body image might also be used to impact health behaviors. It has been well established in the body image literature that weight stigma, or negative weight-related attitudes toward overweight or obese individuals, has significant negative effects on both mental and physical health. Being the target of weight stigma has been shown to increase cortisol reactivity, increase caloric consumption, and decrease feelings of control over one’s eating behaviors, all of which can lead to excess weight gain (Himmelstein, Incollingo Belsky, & Tomiyama, 2015; Major, Hunger, Bunyan, & Miller, 2014; Schvey, Puhl, & Brownell, 2011; Schvey, Puhl, & Brownell, 2014; Tomiyama et al., 2014). Having people form an implementation intention to think well of themselves may help counteract
internalized weight biases (O’Brien et al., 2016). Alternatively, forming an implementation intention to ignore weight-stigmatizing comments may have similar protective benefits. Regarding this latter strategy, previous research has already demonstrated that implementation intentions help individuals ignore appearance-stigmatizing comments (Palayiwa, Sheeran, & Thompson, 2010). Considering the negative behavioral and psychological consequences of weight stigma, studies investigating whether implementation intentions can stop the cycle of weight gain and enhance overall health are warranted.

Methodological strengths of this study include its large sample size, which increased statistical power, and its intention to treat methodology, which minimized the chances of type 1 error. However, as with any research, this study has several limitations that should be acknowledged. First, this study was conducted online, meaning that the generalizability of these findings to real-life situations may be limited. Therefore, future studies should attempt to replicate these findings in more naturalistic settings. Along these lines, the external validity of this study may be constrained due to lack of diversity in the sample. Given that body dissatisfaction and the impact of social comparison differ across race and ethnicity (Bucchianeri et al., 2016; Rancourt, Schaefer, Bosson, & Thompson, 2015), it is necessary to expand this research to diverse populations. Gender should also be taken into consideration. In this current study, we chose to include only women in our sample, as is typical of body image intervention research, based on evidence that women report higher levels of body image disturbance than men (Striegel-Moore et al., 2009). However, increasingly more research is illustrating the need for body image interventions that target men, with some reports estimating that over 50% of men experience some form of body
dissatisfaction (Dakanalis, & Riva, 2013). Therefore, future studies should include male samples. Finally, it is worth noting that this study took place in a single, brief experimental session. Although implementation intentions improved state body satisfaction under this paradigm, it is unknown as to whether similar effects would be observed when implementation intentions are carried out for longer durations. As previously stated, a field study assigning participants to carry out these plans over an extended period of time would be a useful next step in determining the durability of these plans and their potential as lasting interventions.

The present study has established the formation of implementation intentions as a novel strategy for improving body image, particularly within the context of appearance-related social comparison. These findings complement recent research on interventions that improve body image by targeting automatic processes. Future research should focus on replicating and refining these strategies so they may optimally benefit populations at risk for body dissatisfaction.
References


differences, sociocultural influences and health implications (pp. 195–216).


Heinberg, L. J., & Thompson, J. K. (1992). The effects of figure size feedback (positive vs. negative) and target comparison group (particularistic vs. universalistic) on body image disturbance. *International Journal of Eating Disorders, 12*, 441-448.


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Table 1

*Means (and Standard Deviations) for Body Satisfaction by Implementation Intention Condition and Social Comparison Target*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Target</th>
<th>Attractive</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Attractive</td>
<td>4.68</td>
<td>5.21</td>
</tr>
<tr>
<td></td>
<td>(1.76)</td>
<td>(1.70)</td>
<td></td>
</tr>
<tr>
<td>Social Comparison Plan</td>
<td>Attractive</td>
<td>4.94</td>
<td>5.05</td>
</tr>
<tr>
<td></td>
<td>(1.74)</td>
<td>(1.82)</td>
<td></td>
</tr>
<tr>
<td>Body Image Plan</td>
<td>Attractive</td>
<td>5.28</td>
<td>5.32</td>
</tr>
<tr>
<td></td>
<td>(1.87)</td>
<td>(2.09)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2

*Means (and Standard Deviations) for Self-Esteem by Implementation Intention Condition and Social Comparison Target*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Attractive</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
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<td>3.40</td>
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<tr>
<td></td>
<td>(1.18)</td>
<td>(1.11)</td>
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<tr>
<td>Social Comparison Plan</td>
<td>3.29</td>
<td>3.29</td>
</tr>
<tr>
<td></td>
<td>(1.18)</td>
<td>(1.09)</td>
</tr>
<tr>
<td>Body Image Plan</td>
<td>3.21</td>
<td>3.32</td>
</tr>
<tr>
<td></td>
<td>(1.19)</td>
<td>(1.18)</td>
</tr>
</tbody>
</table>
Table 3

*Means (and Standard Errors) for Implicit Appearance Satisfaction by Implementation Intention Condition and Social Comparison Target*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Target</th>
<th>Attractive</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td>.605</td>
<td>.613</td>
</tr>
<tr>
<td></td>
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<td>(.017)</td>
<td>(.017)</td>
</tr>
<tr>
<td>Social Comparison Plan</td>
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<td>.611</td>
<td>.630</td>
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<tr>
<td></td>
<td></td>
<td>(.017)</td>
<td>(.018)</td>
</tr>
<tr>
<td>Body Image Plan</td>
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<td>.670</td>
<td>.678</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.017)</td>
<td>(.017)</td>
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</tbody>
</table>