Understanding the Role of Implicit Self-Esteem in Responses to Positive Feedback

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By

Julia Shekunov

The Ohio State University

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Project Advisor: Dr. Daniel Strunk, Department of Psychology

Abstract

This study examined the effect of positive feedback (in the context of high scores received on an intelligence test) on positive and negative speeded self-ratings, positive and negative affect, and state self-esteem as a function of participants' implicit self-esteem. One prior study found that participants with low explicit self-esteem and low implicit self-esteem felt worse after receiving positive feedback than participants with low explicit and high implicit self-esteem. The present study attempted to replicate this effect in addition to testing whether negative responses to positive feedback can be reduced by a correction procedure. Overall, this study failed to replicate the finding that participants with low explicit self-esteem respond differently to positive feedback as a function of their level of implicit self-esteem.

Understanding the Role of Implicit Self-Esteem in Responses to Positive Feedback

A common belief is that gaining a feeling of success or receiving positive feedback following a particular activity generally promotes positive feelings and self-views. In fact, a key component of Cognitive Therapy for depression is behavioral activation, which involves encouraging patients to engage in activities that provide enjoyment or a sense of mastery. The resulting pleasure and success are thought to reduce patients' preoccupation with depressive thoughts, increase their motivation, and generally provide benefits that improve the course and outcome of therapy (Beck, Rush, Shaw, & Emery, 1979). However, recent research has suggested that the extent to which a person benefits from successful experiences may depend on how they feel about themselves.

Individuals with high self-esteem do indeed feel more positive about themselves following successful experiences (Brown & Dutton, 1995), but it is less clear whether individuals with low self-esteem benefit equally. Baldwin and Sinclair (1996) found that people with low self-esteem associate success with acceptance, and Brown and Dutton (1995) found that people with low self-esteem reported feelings of self-worth that were similar to those reported by people with high self-esteem, following positive feedback. However, other studies have reported that people with low self-esteem are more anxious (Wood et al., 2005), and are more concerned about others' regard than people with high self-esteem after receiving positive feedback (Murray et al., 1998).

Logel et al. (2007) proposed that a specific variable moderates the effect of positive feedback on self-esteem. In the past decade, studies of the self have revealed that there may be a component of self-esteem, termed implicit self-esteem. Implicit self-esteem is generally thought to be an automatic self-appraisal of one's own worth, unlike explicit self-esteem, which is

thought to be a more reflective self-appraisal. While explicit self-esteem is typically measured by self-report scales such as the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), implicit self-esteem is typically measured by reaction time measures such as the Implicit Association Test (IAT; Greenwald et al., 1998). Studies of the relationship between implicit and explicit measures of self-esteem have found that they are only marginally correlated, for example, $r = .12$, $p = .46$ and $r = .21$, $p = .17$ (Greenwald & Farnham, 2000) and $r = .25$, $p = .07$ (Karpinski & Steinman, 2006). Thus, a person may report low explicit self-esteem, yet demonstrate high self-esteem on implicit measures, or vice versa.

There is an ongoing debate regarding whether implicit self-esteem exists within or outside awareness, and whether explicit and implicit self-esteem are part of the same construct or unrelated constructs. A common conceptualization of implicit self-esteem is that it is a distinct construct that is associative in nature, and operates primarily through automatic processes (Jordan et al., in press). However, a number of research findings suggest that implicit and explicit self-esteem are based in part on the same basic self-relevant attitude, with implicit self-esteem being the result of reduced opportunity for self-presentational biases (for a review, see Dijksterhuis et al., 2007). One particular piece of evidence supporting this conclusion comes from a study finding increased correlations between implicit and explicit self-esteem when explicit self-esteem is assessed very quickly or under cognitive load, that is, without opportunity for deliberative processing (Koole et al., 2001). While implying that implicit and explicit self-esteem may be measures of the same basic self-relevant attitude, this finding does support the automatic and associative nature of implicit self-esteem, since explicit self-esteem more closely resembles implicit self-esteem when deliberative processing cannot occur. A recent study has also questioned the common assumption that implicit self-esteem exists largely outside

awareness. Olson et al. (2007) found that when participants are asked to honestly answer self-report measures of self-esteem, implicit self-esteem scores predicted explicit measures of self-esteem in a multiple regression equation. They propose that people are aware of their implicit attitudes towards the self, and that explicit measures of self-esteem are affected by self-presentational biases. Jordan et al. (in press) suggest that implicit attitudes are preconscious, rather than unconscious, and that it is possible to be aware of one's implicit evaluations (experienced as gut feelings), but not the cognitive processes that are creating them. Thus, it seems plausible that implicit and explicit self-esteem represent elements of the same basic self-relevant attitude, and can be experienced simultaneously. Differences between implicit and explicit self-esteem are therefore likely to be due to the influence of self-presentational biases on measures of self-esteem that allow time and opportunity for deliberative processing.

If implicit and explicit self-esteem can be experienced simultaneously, discomfort is likely to arise when one holds discrepant implicit and explicit attitudes. Brinol et al. (2006) found that individuals with discrepant implicit and explicit self-conceptions were highly motivated to engage in processing of discrepancy-related information presumably in order to reduce the discrepancy. According to Jordan et al. (in press), since implicit self-esteem is associative, it can be activated and brought into consciousness by self-relevant stimuli, such as performance feedback. If implicit and explicit self-esteem are incongruent, this may result in psychological discomfort as well as the motivation to reduce resulting distress. Thus, when an individual with low explicit and high implicit self-esteem encounters positive performance feedback, the underlying inconsistency in self-esteem becomes prominent. Jordan et al. (in press) propose that when high implicit self-esteem becomes activated by a self-relevant event it is inferred that there is a "glimmer of hope" in individuals with high implicit and low explicit self-

esteem, and they become more aware of positive self-feelings and views. This provides an opportunity for a positive resolution of the psychological discomfort created by positive feedback, in addition to greater ease at accepting and integrating positive feedback. Thus, individuals with low explicit and high implicit self-esteem are able to psychologically benefit from positive feedback. Conversely, individuals with low explicit and low implicit self-esteem may fare worse following positive self-relevant feedback as this is likely to activate, and bring into consciousness, their low implicit self-esteem (Jordan et al., in press).

A study conducted by Logel et al. (2007) found support for the interaction of one's level of implicit self-esteem with one's level of explicit self-esteem to determine the effect of positive feedback. Specifically, this study found that among participants with *low explicit* self-esteem, following positive feedback, those with *low implicit* self-esteem rated themselves more negatively, were more worried about others' acceptance, and reported lower state self-esteem than participants with *high implicit* self-esteem. Levels of self-reported depressive symptoms were also lower for participants with low explicit and high implicit self-esteem, and in the two weeks following success on midterms, participants with low explicit and high implicit self-esteem reported higher trait self-esteem than those with low explicit and low implicit self-esteem. Thus, success may not benefit all individuals with low explicit self-esteem equally.

Logel et al.'s (2007) results demonstrating that implicit self-esteem moderates how individuals with low explicit self-esteem respond to success correspond to the idea that self-relevant feedback activates one's implicit self-esteem, enabling it to be experienced as a "gut-level feeling" (Jordan et al., in press). Logel et al. (2007) proposed that following the glimmer of hope that is inferred to be the result of receiving positive feedback, individuals with low explicit and high implicit self-esteem face a choice between responding to the positive feedback in line

with their implicit self such that they benefit from it (self-promotion) or responding in a way that maintains their consciously elaborated explicit self-esteem (self-protection). Whether the feedback is positive or negative may play a central role in the choice between self-promotion and self-protection. For example, if feedback is positive, individuals with low explicit and high implicit self-esteem have been found to gain confidence, but if feedback is negative the same individuals report more worry and doubt. Noting such reactivity, Logel et al. (2007) predicted that individuals with low explicit and high implicit self-esteem would generally experience increases in self-esteem following a single occasion of positive feedback, and may be able to maintain higher self-esteem if positive feedback occurs consistently. This increase in self-esteem was expected to be due to individuals with low self-esteem associating positive feedback with greater acceptance from others. Conversely, individuals with low explicit and low implicit self-esteem are thought to not experience a glimmer of hope following positive feedback, rather, their low implicit self-esteem is activated, and therefore they are likely to feel worse following a successful experience. Logel et al. (2007) suggest that these individuals will worry that positive feedback will increase others' expectations of them, and that they will be unable to perform as well in the future. They will engage in self-protection such that although one instance of positive feedback may be initially threatening, it is unlikely to change self-esteem. However, repeated episodes of positive feedback may increase self-esteem as individuals become more confident in their abilities to continually perform well.

In the present study I seek to replicate the finding that individuals with low explicit and low implicit self-esteem benefit less from a single instance of positive feedback than individuals with low explicit and high implicit self-esteem. Another goal is to test whether addressing the potential concerns of participants about the positive feedback experience can reduce differential

responses to success based on levels of implicit self-esteem. To meet these goals, participants

were randomly assigned to one of three feedback conditions: one group did not receive a score

after completing what they were told was a measure of intelligence, one group received a high

score following the measure, and one group was asked to read a statement addressing potential

concerns prior to receiving a high score on the intelligence test.

A third goal of the present study is to compare two measures of implicit self-esteem: the

Implicit Association Test (IAT; Greenwald et al., 1998) and a variation of the IAT known as the

Single-Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006). Both

measures use performance speeds to measure the strength of automatic associations between

concepts. The IAT is more commonly used and comprises of a sequence of classification tasks

that together assess the association between two complementary concepts (such as *warm-cold*)

and two attributes (such as *pleasant-unpleasant*). For clarity, I will refer to the IAT as the

Double-Category IAT (DC-IAT). In each block of trials of the DC-IAT, category names are

presented at the upper right and left corners of the computer screen, and a series of words are

presented, one word at a time, in the center of the screen. Participants are instructed to categorize

each word by pressing a right computer key when the word corresponds to a paired concept and

attribute that appears at the upper right corner of the screen (for example, *warm* and *pleasant*),

and by pressing a left computer key to items corresponding to the other concept and attribute that

appears at the left corner of the screen (for example, *cold* and *unpleasant*). A second task is then

performed in which pair assignments are switched, for example, *warm* and *unpleasant* are paired

together, as are *cold* and *pleasant*. Participants are asked to complete these tasks as quickly as

possible while making few errors. It is assumed that participants will respond faster when the

correct response corresponds to paired items that are strongly associated with one another, for

example *warm* and *pleasant,* and slower when the correct response corresponds to paired items that are not strongly associated with one another, for example *cold* and *pleasant* (Greenwald, 1998). Thus, a person's score in this example would reflect the extent to which he or she believes the characteristics of warm and cold to be pleasant or unpleasant. In measuring implicit self-esteem, the concepts used in the DC-IAT are *me* and *not me,* and the attributes used are *positive* and *negative*.

The SC-IAT is very similar to the DC-IAT, but differs in that it pairs two attributes (*positive* and *negative)* with just one concept (*me*)*.* By eliminating the need for a second contrast category, it is thought to be a more specific evaluative measure. Karpinski and Steinman (2006) describe that the SC-IAT may be useful in cases where an attitude object does not necessarily have a complementary category. In the case of self-esteem, for example, the DC-IAT compares positive and negative associations with the self to positive and negative associations with an unspecified other (*not me* in this case). It is not clear, however, whether this is truly a complementary category and whether participants' categorizations in the DC-IAT reflect their true evaluations of themselves or whether they are influenced by their evaluations of others. The SC-IAT has the potential to eliminate ambiguity in this regard. Another advantage of the SC-IAT is that it may also eliminate some ambiguity in the interpretation of IAT scores. For example, on a self-esteem DC-IAT, a high score could indicate (a) the presence of many positive self-associations, (b) the presence of many negative non-self associations, (c) the absence of negative self-associations, and/or (d) the absence of positive non-self associations (Karpinski & Steinman, 2006). A measure of the evaluative associations of two concepts can be obtained independently using the SC-IAT. Karpinski and Steinman (2006) tested the SC-IAT across three different attitude domains – soda brand preferences, self-esteem, and racial attitudes – and provided initial

evidence for the reliability and validity of the SC-IAT as a measure of implicit social cognition. In the present study, both the DC-IAT and the SC-IAT will be used as measures of implicit self-esteem and analyzed separately in the context of the goals of this study, in addition to being compared to each other and to the explicit measure of self-esteem, the Rosenberg Self-Esteem Scale.

<div align="center">Method</div>

Participants

One hundred and eighty-three undergraduate students (76 male, 107 female; mean age = 19.39) at The Ohio State University participated individually in this study as one possible means of obtaining partial course credit in an introductory psychology course. Participants who were low on explicit self-esteem were selected based on scores from the Rosenberg Self-Esteem Scale, which was completed online for prescreening purposes. Those scoring 18 or less were invited to participate in the study, as this cut-off represented one standard deviation below the mean.

Measures

Beck Depression Inventory - 2nd Edition (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996) is the most current revision of the Beck Depression Inventory. This instrument is a widely used and well-validated measure. It is a 21-item self-report instrument used to assess the severity of symptoms of depression. Each question ranges in point value from 0 to 3, thus possible summary scores range from 0 (minimal depression) to 63 (high depression).

Remote Associates Test (RAT). The RAT (Mednick, 1962) is commonly used as a measure of creativity. In this task participants are presented with three words (e.g. mouse, blue, cottage) and are asked to think of a fourth word that relates to the other three (cheese). This test has been found to be a believable intelligence test (Brown & Dutton, 1995). In accordance with

procedure used by Logel et al. (2007), a total of fifteen of the easy items from this test were presented to participants who were told this is a measure of intelligence that reliably predicts academic achievement.

Rosenberg Self-Esteem Scale (RSE). The RSE is a 10-item self-report scale designed to measure individuals' global self-evaluation. It is used extensively and successfully in psychological research (Blascovich & Tomaka, 1993). Ten statements related to feelings about the self are rated on a four-point scale, ranging from "strongly agree" to "strongly disagree". Possible scores range from 0 to 30, with higher scores indicating higher self-esteem. It was used in this study as a measure of explicit self-esteem.

State Self-Esteem Scale (Heatherton & Polivy, 1991). In this measure of state self-esteem, participants are asked to indicate the extent to which statements such as "I feel good about myself" are true for them at that present moment. There are 20 items and 3 subscales: Social (e.g., I feel concerned about the impression I am making), Performance (e.g., I feel confident about my abilities), and Appearance (e.g., I feel satisfied with the way my body looks right now). Each item has a five-point scale with endpoints labeled "not at all" and "extremely". Possible overall scores range from 20 to 100 [Cronbach's alpha = .90], while scores for the performance and social subscales each range from 7 to 35 [Cronbach's alphas = .80 and .84, respectively], and scores for the appearance subscale range from 6 to 30 [Cronbach's alpha = .83]. Higher scores indicate higher state self-esteem.

Positive and Negative Affectivity Scale (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) is a 20-item self-report questionnaire that measures both positive and negative affectivity. The authors report that the scales are shown to be highly internally consistent and largely uncorrelated. Participants are asked to rate 10 positive and 10 negative feelings and

emotions on a scale from 1 (very slightly) to 5 (extremely) according to how they feel at the present moment. Scores for positive [Cronbach's alpha = .91] and negative affect [Cronbach's alpha = .84] are calculated separately, with scores for each scale ranging from 10 to 50, with a higher score indicating a higher degree of that particular affect.

Speeded Self-Ratings Task. This task was created by Logel et al. (2007) to measure participants' ratings of themselves on twenty adjectives relevant to self-esteem and confidence. The adjectives are from the McFarland and Ross (1982) State Self-Esteem Scale (e.g., proud, competent, confident, efficient, inadequate, ashamed) with the order of presentation randomized for each participant. Ratings are made on a four-point scale ranging from 1 (extremely uncharacteristic of me) to 4 (extremely characteristic of me) within 1,000 ms. Test instructions ask participants to respond within 1,000 ms and are reinforced by the experimenter encouraging participants to respond as quickly as possible. Scores for positive and negative self-views are averaged to obtain total scores, which range from 20 to 80, with higher scores indicating more positive self-views [Cronbach's alpha = .91]. In accordance with Logel et al.'s (2007) procedure, participants are first asked to complete a practice version of the task (using neutral adjectives e.g. casual, orderly) to train them to respond within the time limit.

Manipulation Check. Following completion of the study, but prior to debriefing, participants were asked to complete one item which asks them how satisfied they are with their intelligence test performance on a 5-point scale (1= very satisfied, 5 = not at all satisfied), and a second item which asks them to circle their score on the test, with one option being "I have not received a score".

Implicit Association Test (IAT): Single-Category and Double-Category (see Table 1). In the present study, the concepts used in the DC-IAT are *me* and *not me,* and the attributes used are

positive and *negative*. In the first block, the category labels are *me* and *not me* and participants are asked to characterize target words relating to the self (myself, my, mine, self, own) and words that do not relate to the self (them, their, other, it, they). In the next block, the category labels are *positive* and *negative*, with positive target words being useful, smart, valuable, winner, and confident, and negative target words being failure, worthless, stupid, useless, and weak. In the third and fourth blocks, concepts and attributes are paired, such that *negative* or *not me* are together, and *positive* or *me* appear together. During these blocks, participants are asked to characterize *positive* or *me* words by pressing one key, and *negative* or *not me* words using the other. For example, a *positive* word such as "winner" should be categorized using the same key as the word "self", since this is a *me* word and *positive* and *me* are in the same category in this block. The fifth block is identical to the first block, with category labels being *me* and *not me*. In the sixth and seventh block, opposite concepts and attributes are paired than in the third block, such that *negative* or *me* are paired together, and *positive* or *not-me* are paired together. Thus, a *negative* word such as "failure" should be categorized using the same key as a *me* word such as "mine". Individuals with high implicit self-esteem are expected to find this particular task difficult and typically perform slower because their positive self-feelings are likely to interfere with the association of the self with unpleasant attributes.

In the Single-Category Implicit Association Test (SC-IAT), two attributes (*positive* and *negative)* are paired with just one concept (*me)*. In one critical block participants are asked to categorize *positive* or *me* words using one key, and *negative* words using another key. In the second critical block, *negative* or *me* words are categorized using the same key, while *positive* words are categorized using another computer key. Individuals with high implicit self-esteem are expected to respond faster than individuals with low implicit self-esteem in the first critical block

(where *positive* or *me* words are categorized using the same key) than in the second critical block (where *negative* or *me* words are categorized using the same key) because in the latter block their positive self-feelings are likely to interfere with the association of the self with unpleasant attributes. The DC-IAT is thought to encourage a dichotomous mind-set that may affect the SC-IAT if the DC-IAT is administered first, so in accordance with recommendations by Karpinski and Steinman (2006), all participants in the present study completed the SC-IAT directly prior to completing the DC-IAT.

Scoring the IAT

The raw output data from the DC-IAT was transformed into a single implicit self-esteem score using the scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003). In order to clean the data, the algorithm removed trials with latencies less than 400 ms or more than 10,000 ms, as well as participants for whom more than 10% of trials had latencies less than 300 ms. Error trial latencies were replaced with the mean reaction time for the block in which the error occurred, plus a penalty of 600 ms. With the data cleaned, scores were calculated for blocks in which concepts (*me* and *not-me*) and attributes (*positive* and *negative*) were paired together: blocks three and four (same labels) and blocks six and seven (opposite labels as blocks three and four). In accordance with the scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003), the mean reaction time within each critical block was calculated for each participant, and the mean reaction time for block three was subtracted from the mean reaction time for block six, while the mean reaction time for block four was subtracted from the mean reaction time for block seven. The difference score for blocks three and six was then divided by the pooled standard deviation for blocks three and six, and the difference score for blocks four and seven was divided by the pooled standard deviation for blocks four and seven. The resulting two values

were then averaged to obtain a single implicit self-esteem score (termed *D* by Greenwald, Nosek, & Banaji, 2003) for each participant, with higher scores indicating higher implicit self-esteem. Scores from twelve participants were excluded because nine had missing scores and three had *D* scores that were extreme outliers[1].

The raw output data from the SC-IAT was transformed into a single implicit self-esteem score in a similar way using a version of the scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003) that had been modified by Karpinski and Steinman (2006). In order to clean the data, trials with latencies less than 350 ms or more than 10,000 ms were removed, as were participants for whom more than 10% of trials had latencies less than 300ms. Error trial latencies were replaced with the mean reaction time for the block in which the error occurred plus a penalty of 400 ms. With the data cleaned, scores were calculated for blocks two and four in which the *me* concept was paired with each of the two attributes (*positive* and *negative*). A mean reaction time within each critical block was calculated for each participant, and the mean reaction time for block two was subtracted from the mean reaction time for block four. The difference score was then divided by the pooled standard deviation to obtain a single implicit self-esteem score (*D*) for each participant, with higher scores indicating higher implicit self-esteem. Scores from eleven participants were excluded because nine had missing scores and two had *D* scores that were extreme outliers[2].

Procedure

Participants arrived at the Psychology Building as scheduled. The procedure was explained to all participants who were then offered the opportunity to provide informed consent. Those who provided consent were asked to complete the following measures: Rosenberg Self-Esteem Scale, Beck Depression Inventory-II, PANAS, SC-IAT and DC-IAT. Participants were

then asked to complete a practice version of the Speeded Self-Ratings Task in order to train them to respond within the 1,000 ms time limit. To familiarize participants with the task, the first block of trials involved participants rating themselves on neutral words (e.g., casual, orderly) with no time limit. In the second block participants were asked to rate themselves on neutral words and received automatic feedback if they responded in less than one second.

Participants then completed what they were told was a measure of intelligence that reliably predicts academic achievement. This measure was actually comprised of 15 items from the Remote Associates Test, as in the study conducted by Logel et al. (2007). Participants were randomly assigned to one of three feedback conditions. In the positive feedback condition, following test completion, participants saw a final screen saying, "Test completed. Adjusted percentage score: 86%; Adjusted percentile score: 85th percentile; Rank 52 out of 351. Please see experimenter". Pilot testing by Logel et al. (2007) found that these were the highest scores that participants were willing to believe. Scores remained on the screen while participants alerted the experimenter that the test had been completed, and the experimenter reinforced the positive feedback by commenting, "Wow, that's a really high score!" (Logel et al., 2007). In the no feedback condition, participants saw a final screen saying, "Test completed. Please see experimenter". In the correction condition, following completion of the test but prior to receiving their scores, participants saw a statement on the screen asking them to note that based on the scores from the surveys submitted thus far, they may be vulnerable to feeling unhappy with their score (regardless if it is low or high) and to recognize that the test taken is a widely used, reliable and valid measure of intelligence. Participants in this condition then saw a final screen saying, "Test completed. Adjusted percentage score: 86%; Adjusted percentile score: 85th percentile; Rank 52 out of 351. Please see experimenter". As in the positive feedback condition, scores

remained on the screen while participants alerted the experimenter that the test had been

completed, and the experimenter reinforced the positive feedback by commenting, "Wow, that's

a really high score!" (Logel et al., 2007).

Following the test, participants were asked to complete the following measures: PANAS,

Speeded Self-Ratings Task and the State Self-Esteem Scale. As a manipulation check,

participants were asked to complete a brief survey about their test performance in which were

asked about their satisfaction with the test as well as to report the score received on the test.

Participants were then debriefed about the study.

<div align="center">Results</div>

Predictions

Based on the results found by Logel et al. (2007), it was predicted that participants who

were initially selected to be low on explicit SE would make self-ratings more consistent with

their levels of implicit SE following positive feedback than after receiving no feedback.

Individuals with low implicit SE were expected to rate themselves more negatively than

individuals with high implicit SE following positive feedback compared to following no

feedback. Individuals with high implicit SE were expected to rate themselves more positively

following positive feedback compared to no feedback. Participants in the correction condition

were expected to rate themselves more positively than participants in the no feedback condition,

regardless of their level of implicit SE.

Correlations between implicit and explicit measures of self-esteem

The mean score on the Rosenberg Self-Esteem Scale completed during the main portion

of the study was 16.5 ($SD = 2.06$). Explicit self-esteem scores on the Rosenberg Self-Esteem

Scale did not correlate with implicit self-esteem scores on the DC-IAT [$r=-.05$, $p=.49$] which is

consistent with prior findings (Logel et al., 2007; Farnham et al., 1999). Explicit self-esteem scores on the Rosenberg Self-Esteem Scale also did not correlate with implicit self-esteem scores on the SC-IAT [r=.05, p=.47]. Implicit self-esteem scores on the DC-IAT did not correlate with implicit self-esteem scores on the SC-IAT [r=.01, p=.85].

Correlations between depressive symptoms and discrepancies between implicit and explicit self-esteem

Difference scores were examined to explore the relationship between depressive symptoms and discrepancies between implicit and explicit self-esteem. No significant correlation was found between difference scores between the DC-IAT and the Rosenberg Self-Esteem Scale, and BDI-II scores, as well as between difference scores between the SC-IAT and the Rosenberg Self-Esteem Scale, and BDI-II scores. A small yet significant positive correlation (r =.15, p =.042) was found between the DC-IAT and the SC-IAT difference scores, and BDI-II scores (see Table 2).

Manipulation check

When participants were asked to circle the score they received on the intelligence test in the manipulation check, 71% of participants in the no feedback condition correctly identified themselves as having received no score. In both the positive feedback condition and the correction condition, 22% of participants incorrectly identified their received score as being in the 76%-85% range, rather than in the 86-95% range. However, this may be attributed to the fact that although the question asked for the percentage score (which was 86%), participants may have been confused because in accordance with procedure used by Logel et al. (2007), the percentile score that was also presented to participants in these conditions was 85th percentile. The remainder of participants in these conditions correctly identified their score as being within

the 86-95% range.

Group differences in test satisfaction were also examined as a manipulation check, with significant differences found [$F(2,176) = 7.65, p < .001$]. The test satisfaction question in the manipulation check was reverse coded such that higher scores indicated more satisfaction. Differences were analyzed using Scheffe's post hoc comparisons. A significant difference was found in test satisfaction between the correction condition and no feedback condition, such that participants in the correction condition rated themselves to be more satisfied with the intelligence test than participants in the no feedback condition [$F= 3.05, df= 177, p < .05, Ms = 3.55$ ($SD= 0.94$) and 2.82 ($SD=1.09$) respectively]. No other significant differences were found.

Exclusion Criteria

The Rosenberg Self-Esteem Scale was administered both during pre-screening and during the study in order to ensure a sample scoring low on explicit self-esteem. Participants scoring greater than 18 on the RSE during the experiment were excluded from the following analyses, as this was the same cut-off used to select participants low on explicit self-esteem during pre-screening (representing one standard deviation below the mean). A second exclusion criterion involved the number of questions unanswered in the intelligence test. A participant in the positive feedback condition or the correction condition who does not answer the majority of the questions on the intelligence test may be less likely to believe that they received a high score on the test. Thus, participants who did not answer nine or more out of fifteen questions were also excluded as this represented more than 60% of questions going unanswered. Using both exclusion criteria reduced the sample size to approximately 113 people [3].

Speeded Self Ratings

Participants failed to respond within 1,000 ms on 50% of trials, and within 1,500 ms on 19% of trials. Regression analyses revealed no significant interactions between implicit self-esteem (measured by the DC-IAT or the SC-IAT) and feedback condition in predicting speeded self-ratings (see Table 3). Regression analyses revealed a marginally significant main effect of feedback condition in predicting speeded self-ratings (see Table 4). Overall, participants in the correction condition were less negative about themselves than participants in the no feedback condition or participants in the positive feedback condition, although no significant group differences were found using Scheffe's post hoc comparisons.

Table 3: *Interaction of feedback condition (testing all three conditions) and implicit self-esteem (measured by the SC-IAT and DC-IAT) on Speeded Self Ratings*

DC-IAT		SC-IAT	
$F(2, 105)$	P	$F(2, 105)$	p
1.09	.341	0.74	.477

Table 4: *Main effect of feedback condition (testing all three conditions) on Speeded Self Ratings*

$F(2, 109)$	p	M	SD
2.52	.085	3.08	0.47

Positive and Negative Affect

The positive affectivity and negative affectivity scales of the PANAS given following the intelligence test were also examined as dependent variables, with scores on the PANAS given prior to the intelligence test controlled for in the regression equation. Regression analyses

revealed no significant interactions of implicit self-esteem (measured by the DC-IAT and SC-IAT) and feedback condition in predicting positive and negative affect (see Table 5). Regression analyses also revealed no significant main effect of feedback condition in predicting negative affect or in predicting positive affect (see Table 6).

Table 5: *Interaction of feedback condition (testing all three conditions) and implicit self-esteem (measured by the SC-IAT and DC-IAT) on positive and negative affect*

	DC-IAT		SC-IAT	
	$F(2, 106)$	p	$F(2, 106)$	p
Positive	0.04	.962	0.16	.200
Negative	1.56	.214	0.40	.669

Table 6: *Main effect of feedback condition (testing all three conditions) on positive and negative affect*

	$F(2, 110)$	p	M	SD
Positive	0.41	.663	26.4	8.15
Negative	0.75	.473	15.3	5.30

State Self-Esteem

Regression analyses revealed no significant interaction of implicit self-esteem (measured by the DC-IAT and SC-IAT) and feedback condition in predicting overall scores on the State Self-Esteem Scale or on scores from each of the three subscales: Performance Self-Esteem, Social Self-Esteem and Appearance Self-Esteem (Table 7). There was no main effect of

feedback condition in predicting overall scores from the State Self-Esteem Scale or scores on each of the three subscales of this scale (Table 8).

Table 7: *Interaction of feedback condition (testing all three conditions) and implicit self-esteem (measured by the SC-IAT and DC-IAT) on state self-esteem (sub-scales and total)*

	DC-IAT		SC-IAT	
	$F(2, 107)$	P	$F(2, 107)$	p
Appearance	1.32	.273	1.48	.233
Performance	0.28	.754	1.66	.195
Social	0.97	.381	0.04	.962
Total	0.76	.468	1.43	.244

Table 8: *Main effect of feedback condition (testing all three conditions) on state self-esteem*

	$F(2, 111)$	p	M	SD
Appearance	.01	.994	18.2	4.58
Performance	.33	.720	25.2	4.68
Social	2.56	.082	23.6	5.39
Total	.06	.946	45.5	8.62

Discussion

This study examined how participants with low explicit self-esteem respond to positive feedback as a function of their implicit self-esteem. Based on results found by Logel et al. (2007), participants were predicted to make self-ratings that correspond to their levels of implicit SE following positive feedback rather than after receiving no feedback, such that participants

with high implicit self-esteem would have more positive self-views than participants with low implicit self-esteem following positive feedback, compared to following no feedback. In the aforementioned study, participants with low explicit and high implicit self-esteem rated themselves more positively on the Speeded Self-Ratings Task after receiving a high score on an intelligence test than participants with low explicit and low implicit self-esteem. The present study failed to replicate these results; there was no significant interaction between either measure of implicit self-esteem and feedback condition in predicting participants' self-ratings. Similarly, Logel et al. (2007) found a significant interaction between implicit self-esteem and condition on participants' state self-esteem, such that participants with low implicit self-esteem reported lower state self-esteem after positive feedback than participants with high implicit self-esteem. This was also not replicated in the present study. Positive and negative affect were also examined as dependent variables, with no significant main effects of feedback condition or interactions.

Had significant interactions between feedback condition and implicit self-esteem been found, a third correction condition would have been used to examine whether providing participants with a statement addressing possible vulnerabilities and doubts about the intelligence test has any effect on self-ratings, positive and negative affect or state self-esteem. Since no such interaction was found, the quality of the correction (the goal of which was to provide a "glimmer of hope" in participants where this may have been lacking) cannot be adequately evaluated.

One possible reason for the failure to replicate Logel et al.'s (2007) finding is that participants who received positive feedback may not have believed the feedback. This may be why there were no significant main effects of feedback condition on self-ratings, positive and negative affect, or state self-esteem. However, this is unlikely because there was no difference in procedure used between this study and that of Logel et al. (2007), and furthermore, both studies

used a college student sample. In a future replication, however, it may be worthwhile to include an additional question within the manipulation check in order to address the believability of the positive feedback.

Another possible reason for the lack of significance is that although participants were asked to provide self-ratings within 1,000 ms, on average 50% of the ratings were provided at a slower pace. Participants responded within 1,500 ms on 81% of trials. Despite structural and procedural similarities in the Speeded Self-Ratings Task between Logel et al.'s (2007) study and the present study, in the former, participants failed to respond within the 1,000 ms time period on only 12% of trials (the data from these trials were not removed from the analysis). In future versions of this task, increasing the number of practice words may help participants to respond faster during the testing portion. It is also possible that participants responded slower than expected during this task because they felt fatigued after completing the measures of explicit self-esteem, depressive symptoms, and both the DC-IAT and the SC-IAT. The participants in Logel et al.'s (2007) study completed fewer measures prior to taking the Speeded Self-Ratings Task (since the SC-IAT was not included in this study) and therefore may have responded faster due to being less fatigued.

Another possibility is that one's level of implicit self-esteem does not significantly affect one's response to receiving positive feedback and that the results obtained by Logel et al. (2007) were achieved by chance. I believe that this is the most likely possibility because the procedure in the present study closely followed that used in Logel et al.'s (2007) study. For example, the intelligence test was identical as well as the feedback provided in the no feedback and positive feedback conditions. Furthermore, Logel et al. (2007) also used the Speeded Self Ratings Task (including a practice version) and the State Self-Esteem Scale as dependent variables, as in the

present study. Both studies also used college-student sample, although Logel et al. (2007) had a smaller sample size of eighty-two participants.

An additional goal of the present study was to compare two versions of the Implicit Association Test: a Double-Category version and a Single-Category version. In accordance with prior research, the DC-IAT did not correlate with the Rosenberg Self-Esteem Scale (used to measure explicit self-esteem). In the present study, the SC-IAT also did not correlate with the Rosenberg Self-Esteem Scale. A study conducted by Karpinksi and Steinman (2006), however, found a moderate to large-sized correlation between implicit self-esteem as measured by the SC-IAT and explicit self-esteem as measured by the Rosenberg Self-Esteem Scale and two other measures of explicit self-esteem, a self semantic differential and a self feeling thermometer, $r(42) = .38, p = .01$. A regression analysis conducted by Karpinksi and Steinman (2006) found that SC-IAT scores were unique predictors of explicit self-esteem ($\beta = .40, p = .01$) whereas DC-IAT scores were not ($\beta = -.09, p = .54$). The authors acknowledge that the correlation between SC-IAT and explicit measures of self-esteem is larger than typically observed, but note that it is similar in size to correlations found between an affective priming measure of self-esteem and explicit measures of self-esteem (Wentura, Kulfanek, & Greve, 2005). In the Karpinksi and Steinman (2006) study, there was also a small and nonsignificant correlation between the DC-IAT and the SC-IAT, $r(50) = .25, p = .07$, a finding that is similar to the present study (although Karpinski and Steinman's finding is closer to significance).

The lack of correlation between the DC-IAT and the SC-IAT is interesting because there are only subtle differences between these two measures. Differences include the number of blocks and number of trials per block, in addition to the number of category options presented (with *not me* being present in the DC-IAT, but not the SC-IAT). Karpinski and Steinman (2006)

proposed that the measure of self-associations by the SC-IAT is theoretically distinct from the

DC-IAT's measure of self/not-self associations because of the lack of correlation between these

two measures of implicit self-esteem. The SC-IAT therefore has potential to make a unique

contribution to the understanding of implicit social cognitions, particularly in cases where the

choice of a complementary category to a category of interest is not particularly obvious.

In conclusion, although the findings of the present study did not support those of Logel et

al. (2007), it is clear that there should be a place for the study of implicit self-esteem (and thus,

measures of it) within self-esteem research.

References

Beck, A. T., Rush. A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression.* New York: Guilford Press.

Baldwin, M. W., & Sinclair, L. (1996). Self-esteem and "if…*then*" contingencies of interpersonal acceptance. *Journal of Personality and Social Psychology, 71,* 1130-1141.

Beck, A. T., Steer, R. A., & Brown, B. K. (1996). *Beck depression inventory manual* (2nd ed.). San Antonio, TX: Psychological Corporation.

Blascovich, J., & Tomaka, J. (1993). Measures of self-esteem. In J. P. Robinson, P. R. Shaver & L. S. Wrightsman (Eds.), *Measures of Personality and Social Psychological Attitudes* (3rd ed., pp. 115-160). Ann Arbor, MI: Institute for Social Research.

Brinol, P., Petty, R. E., & Wheeler, S. C. (2006). Discrepancies between explicit and implicit self-concepts: Consequences for information processing. *Journal of Personality and Social Psychology, 91,* 154-170.

Brown, J. D., & Dutton, K. A. (1995). The thrill of victory, the complexity of defeat: Self-esteem and people's emotional reactions to success and failure. *Journal of Personality and Social Psychology, 68,* 712-722.

Dijksterhuis, A., Albers, L. W., & Bongers, K. C. A. (2007). *Digging for the real attitude: Lessons from research on implicit and explicit self-esteem.* Manuscript submitted for publication.

Farnham, S. D., Greenwald, A. G., & Banaji, M. R. (1999). Implicit self-esteem. In D. Abrams & M. A. Hogg (Eds.), *Social identity and social cognition* (pp. 230-248). Malden, MA: Blackwell.

Greenwald, A. G., & Farnham, S. D. (2000). Using the Implicit Association Test to

measure self-esteem and self-concept. *Journal of Personality and Social Psychology, 79,* 1022-1038.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74,* 1464-1480.

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85,* 197-216.

Heatherton T. F., Polivy. J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology, 60,* 895–910.

Jordan, C. H., Logel, C., Spencer, S. J., & Zanna, M. P. & Whitfield, M.L. (in press). *The Heterogeneity of self-esteem: Exploring the interplay between implicit and explicit self-esteem.* In R. E. Petty, R. H. Fazio, & P. Briñol (Eds.) *Attitudes: Insights from the new implicit measures.* Mahwah, NJ: Erlbaum.

Karpinski, A. & Steinman R. B. (2006). The Single Category Implicit Association Test as a Measure of Implicit Social Cognition. *Journal of Personality and Social Psychology, 91,* 16-32.

Koole, S. L., Dijksterhuis, A., & van Knippenberg, A. (2001). What is in a name: Implicit self-esteem and the automatic self. *Journal of Personality and Social Psychology, 80,* 669-685.

Logel, C., Spencer, S. J., Wood, J. V., Holmes, J. G, & Zanna, M. P. (2007). *How Self-Image Processes Unfold: The role of explicit self-esteem, implicit self-esteem, and others' acceptance.* Manuscript submitted for publication.

McFarland, C., & Ross, M. (1982). Impact of causal attributes on affective reactions to

success and failure. *Journal of Personality and Social Psychology, 43,* 937-946.

Mednick, S. A. (1962). The associative basis of the creative process. *Psychological*

Review, 26, 220-232.

Murray, S. L., Holmes, J. G., MacDonald, G., & Ellsworth, P. C. (1998). Through the

looking glass darkly? When self-doubts turn into relationship insecurities. *Journal of*

Personality and Social Psychology, 75, 1459-1480.

Olson, M. A., Fazio, R. H. & Hermann, A. D. (2007). Reporting tendencies underlie

discrepancies between implicit and explicit measures of self-esteem. *Psychological*

Science, *18*(2), 287-291.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton

University Press.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures

of positive and negative affect: The PANAS scales. *Journal of Personality & Social*

Psychology, 54, 1063-1070.

Wentura, D., Kulfanek, M., & Greve, W. (2005). Masked affective priming by name letters:

Evidence for a correspondence of explicit and implicit self-esteem. *Journal of*

Experimental Social Psychology, 41, 657-663.

Wood, J. V., Heimpel, S. A., Newby-Clark, I. R., & Ross, M. (2005). Snatching defeat

from the jaws of victory: Self-esteem differences in the experience and anticipation of

success. *Journal of Personality and Social Psychology, 89,* 764-780.

Appendix A

Double-Category and Single-Category Implicit Association Test Words

Positive	*Negative*	*Me*	*Not-me*******
Successful	Unable	Myself	They
Deserving	Loser	My	Them
Motivated	Weak	Mine	Their
Smart	Unlovable	Self	It
Confident	Useless	Own	Other
Lovable	Stupid	I*	
Worthy	Unimportant	Me*	
Winner	Nobody		
Valuable	Worthless		
Useful	Failure		

*   Appear only in SC-IAT

** Appear only in DC-IAT

Appendix B

Speeded Self-Ratings Words

Practice	Test
casual	proud
orderly	competent
musician	confident
sophisticated	smart
curious	resourceful
communicative	effective
artist	efficient
formal	inadequate
practical	incompetent
oriented	stupid
	worthless
	ashamed
	secure
	likable
	self-assured
	insecure
	discouraged
	uncertain
	uneasy
	unsettled

Footnotes

[1] The same pattern of results emerges if these participants are included in the analysis.

[2] The same pattern of results emerges if these participants are included in the analysis.

[3] The same pattern of results emerges if these participants are included in the analysis.

Table 1

Comparison of the DC-IAT and the SC-IAT

DC-IAT					SC-IAT				
Block	*Trials*	*Function*	*Left-key response*	*Right-key response*	*Block*	*Trials*	*Function*	*Left-key response*	*Right-key response*
1	20	Practice	Not-me	Me					
2	20	Practice	Negative	Positive					
3[a]	20	Test	Negative + Not-Me	Positive + Me	1[c]	24	Practice	Positive + Me	Negative
4[a]	40	Test	Negative + Not-Me	Positive + Me	2[c]	72	Test	Positive + Me	Negative
5	40	Practice	Me	Not-Me					
6[b]	20	Test	Negative + Me	Positive + Not-Me	3[d]	24	Practice	Positive	Negative + Me
7[b]	40	Test	Negative + Me	Positive + Not-Me	4[d]	72	Test	Positive	Negative + Me

Note. Blocks marked with a common subscript were experienced as one continuous block

Table 2

Correlations between self-esteem discrepancies and depression (N=183)

DC-IAT and SC-IAT difference scores correlated with BDI-II	DC-IAT and RSE difference scores correlated with BDI-II	SC-IAT and RSE difference scores correlated with BDI-II
$r =.15, p =.042$	$r =.047, p =.53$	$r =-.099, p =.18$