

Individual Differences in Implicit and Declared Self-Esteem as Predictors of Response to Negative Performance Evaluation: Validating Implicit Association Test as a Measure of Self-Attitudes

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Differential and combined influence of implicit and explicit self-esteem (SE) on individual's response to negative feedback was examined in a controlled experiment. Sixty-three psychology undergraduates performed a simulated social interaction task, followed by an artificial negative feedback on their performance. Self-reported (explicit) SE was found to be predictive of participants' evaluation of the confederate who conveyed the feedback but was unrelated to their emotional response to feedback itself. The magnitude of this emotional response was predicted by an implicit SE measure derived from Implicit Association Test (IAT) but was unrelated to explicit SE. Findings are consistent with the theorized link between SE and sensitivity to criticism, thus supporting IAT's construct validity as a measure of implicit SE.

William James (1890) theorized that a person with genuinely high self-esteem (SE) should be able to receive negative feedback without finding it too painful. Re-

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search has since shown that high-SE individuals, in general, do tend to experience less distress and respond more constructively to negative feedback than low-SE individuals do (Brockner, 1983; Brown & Dutton, 1995; Dodgson & Wood, 1998; Greenberg et al., 1992). However, some people who declare high SE through self-report have been found to be highly sensitive to negative feedback (Baumeister, Heatherston, & Tice, 1993).

The inconsistency of these findings should question either the validity of the initial theoretical contention or the validity of SE measured through self-report. Apart from being subject to instability (Kernis, Greenier, Herlocker, Whisenhunt, & Abend, 1997; Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000), explicit SE measures are known to be confounded, not only by impression management and social desirability (cf. Aidman, 1999), but also by self-deception and the need for approval (Farnham, Greenwald, & Banaji, 1999). In addition, there is growing evidence suggesting that at least some elements of self-evaluation may be inaccessible to self-report and, as such, may form the basis of implicit SE (Aidman, 1999; Greenwald & Banaji, 1995; Kihlstrom, 1999).

Need for approval and self-deception as sources of "measurement noise" in explicit SE measurement are inextricably linked. For example, Story (1998) found that individuals' memory for feedback is mediated by their level of SE and the favorability of that feedback. This implies sensitivity to feedback may be guided by its congruency with the person's global level of self-evaluation, whereby sensitivity refers to the negative emotional response to feedback (Shrauger, 1975). Further, individuals who report both high explicit SE and high need for approval—a combination termed *defensive SE* (Hewitt & Goldman, 1974)—tend to find negative feedback particularly painful. For example, following an experience of failure, these "defensive self-esteemers" tend to report substantially lower aspirations (Lobel & Teiber, 1994) and a stronger increase in need for approval (Schneider & Turkat, 1975) than their nondefensive counterparts. They are also more prepared to cheat in the name of achievement (Lobel & Levanon, 1988).

The impact of self-deception on the assessment of SE is well established, but its conceptual status remains unclear. Rosenberg (1979) suggested that SE is unlikely to represent honest appraisal of one's traits and abilities, and Baumeister, Tice, and Hutton (1989) extended this argument to suggest that explicit SE measurements capture the motive to present a positive attitude toward self rather than genuine self-attitude. Others (cf. Paulhus, 1986) maintain that self-deception is an element of SE, and it should be allowed to emerge. This latter stance is based on the rationale that self-deception frequently manifests itself as an overestimation of one's abilities and good qualities as well as a belief and expectation of positive things in one's life (Taylor & Brown, 1988), which are all considered to be marks of successful adjustment (Whitley, 1983). It has been suggested that self-deception could involve holding positive explicit beliefs and negative implicit beliefs simultaneously (Sacheim & Gur, 1978).

Kernis et al. (2000) found that the influence of externally sourced evaluative events (e.g., a compliment) varies considerably depending on the stability of the individual's SE. Although stable self-esteemers have well-anchored feelings of self-worth, unstable self-esteemers react sensitively to both positive and negative feedback. Unstable SE makes people react more strongly to events they deem to be SE relevant (Kernis et al., 1997, 2000). It also invests SE relevance into a wider range of life events and everyday experiences, which results in the person's feelings of self-worth being "continually on the line" (Kernis et al., 2000, p. 1298). Unstable SE was also found to be associated with a tendency to report greater self-doubt following failure among a group of high self-esteemers (Kernis et al., 1997). Further findings (Kernis et al., 1998) suggested that unstable SE reflects fragile feelings of self-worth that exacerbate depressive symptoms under certain circumstances. The implication is that depression may originate as a result of this lack of a central source of stable self-worth, independent of specific evaluative information (Kernis et al., 1998). There is growing evidence indicating that SE may also have an anxiety-buffering function (Greenberg et al., 1992).

In sum, the protective properties of SE that may play a buffering role against the challenges of life, such as anxiety (Greenberg et al., 1992) and failure (Kernis et al., 1997, 2000), are likely to be subject to both differential and combined influences of implicit and explicit SE. They are also likely to reveal themselves through individuals' responses to evaluation. Among the broad range of evaluative experiences, reactions to negative evaluation seem to be particularly revealing of this buffering role of SE. Thus, depressive patients do not differ from controls in positive appraisals but get substantially more pessimistic about negative ones (Haaga & Beck, 1995).

The role of low SE in depressive symptomology is well established (cf. Day, Kane, & Roberts, 2000; Kernis et al., 1998). Its prevalence in today's society makes it particularly important to examine the SE sources of emotional vulnerability to negative evaluation. Sensitivity to negative feedback may also be critical as a precursor to other risk factors associated with low SE.

IMPLICIT AND EXPLICIT SELF-ESTEEM

Traditionally, it has been common practice to operationalize SE using direct self-report measures to assess affective self-regard (explicit SE; Allport, 1937; Rogers, 1951; Rosenberg, 1979; Tafarodi & Swann, 1995). The evidence is mounting, however, that SE, as an attitude (i.e., self-attitude, cf. Byrne, 1996) and thus a special form of social cognition, operates at an implicit level as well (Devine, 1989; Epstein & Morling, 1995; Greenwald & Banaji, 1995; Kihlstrom, 1999; Kihlstrom & Cantor, 1984). The effects of mere ownership (Nuttin, 1985) and name letter preference effects (Hoorens, 1990; Nuttin, 1987), in-group bias

(Brewer, 1979; Ostrom & Sedikides, 1992) including minimal group effects (Tafarodi & Milne, 2002; Tajfel, 1970), displaced SE and reciprocity (Cialdini, 1993), implicit association and rejection (Suls & Wills, 1991) have all been theorized as traceable to, and possibly modulated by, the influences of self-affect that are not necessarily well identified or even introspectively accessible by the participant. These and other similar effects have been collectively conceptualized as implicit SE phenomena (Greenwald & Banaji, 1995), and defined as "the introspectively unidentified (or inaccurately identified) effect of the self-attitude on evaluation of self-associated and self-dissociated objects" (p. 11).

According to cognitive-experiential self theory (CEST; Epstein & Morling, 1995), explicit and implicit SEs are differentially associated with two distinct information processing systems. Explicit SE is derived from the rational system, which involves one's conscious, verbal appraisal of self-worth and thus can be measured at the verbal level through self-report questionnaires. Implicit SE is derived from the experiential system, which involves one's schematic appraisals and consequent feelings about the self. Elements of the experiential system may not be accessible by direct verbal report; these implicit beliefs must therefore be assessed indirectly. The degree of relation between implicit and explicit SE has been theorized to be subject to substantial individual differences (Epstein & Morling, 1995), consistent with casual observations that the two appraisals may or may not coincide. Further evidence is also mounting that associations between empirical estimates of implicit and explicit SE are quite modest, if not weak (Aidman, 1999; Farnham et al., 1999; Meagher & Aidman, 2001). In view of this evidence, it seems appropriate to redefine *genuinely high SE* as a combination of high implicit and high explicit SE, and accordingly, *genuinely low SE* as a combination of low implicit and low explicit SE.

Although implicit SE effects are well established as general population trends, the prediction that the magnitude of these effects at the level of individual differences should be modulated by the individual levels of SE has not been possible to examine empirically, at least until recently, as it requires indirect measurement procedures that "neither inform the participant of what is being assessed nor request self-report concerning it" (Greenwald & Banaji, 1995, p. 5). Two different classes of methods have been predicted in the emerging methodology of indirect SE measurement—judgment latency measures and projective measures (Greenwald & Banaji, 1995). The recently developed IAT (Greenwald, McGhee, & Schwartz, 1998) represents the former, and the Self-Apperception Test (Aidman, 1999) the latter. This latest development has enabled direct empirical examination of the moderating effects of implicit SE on the magnitude of in-group bias, both in stable groups, such as gender (Aidman & Carroll, 2003; Farnham et al., 1999), and minimal group contexts (Aidman & Hjorth, 2003) as well as on name letter preference effects and projected self-positivity (Aidman, 1999), and it seems only a matter of time for more similar findings to follow.

The IAT (Greenwald et al., 1998) is based on the assumption that implicit attitudes manifest themselves as actions or judgments influenced by automatically activated evaluation, without requiring an awareness of that causation. In particular, the strength of an attitude can be measured by the ease with which one concept is reacted to when combined with another (cf. Fazio, 1986). People are able to make faster judgments of words for which they had well-developed self-schemas (Markus, 1977). The IAT uses the automatic activation of attitude effect and the fact that self-concept is a well-integrated schema with an affective, attitudinal component that influences how self-relevant information is processed (Fiske & Pavelchak, 1986). High implicit SE is inferred in the IAT from longer response times to evaluatively incompatible word combinations, such as words associated with the self and negative valence, compared to evaluatively compatible word combinations, such as words associated with the self and positive valence. The magnitude of difference between the mean response latencies to the two key stimulus word combinations—evaluatively compatible and incompatible—was termed the *IAT effect* and interpreted as representing the strength of the respective implicit attitude (Greenwald et al., 1998).

The alternative methodology is used in the Self-Apperception Test (Aidman, 1999), a standardized semiprojective test that employs Fedotova's (1987) version of Liggett's (1959) projective facial images in a visual semantic differential (VSD) format, which does not completely eliminate the reliance on verbal self-report but substantially diminishes it. The Self-Apperception Test builds on a number of earlier attempts to apply projective methodology to the assessment of cognitive aspects of self (cf. Bannister & Francella, 1966). The schematic facial sketches with various expressions, sufficiently ambiguous to encourage projection, are presented to the participant in a card-sorting procedure or on a computer screen, to be rank ordered along several VSD scales, which include two base scales—attitudinal (*liking-disliking*) and self-reference (*like me-dislike me*)—as well as a number of attribute scales such as *strong-weak*, *happy-sad*, and so forth. The rankings on the self-reference scale and any of the attribute scales (estimated through rank order correlations) represents the level of implicit self-appraisal on that respective attribute. Similarly, correlations of the face rankings on the attitudinal and any of the attribute scales represents the valence of the respective attribute. Finally, correlation between the face rankings on the self-reference and the attitudinal scales is interpreted as undifferentiated (global) implicit self-liking. The instrument has shown acceptable levels of internal consistency and retest stability, as well as promising validity characteristics. The Self-Apperception Test-derived index of Implicit Self-Liking (ISL) showed weak correlations with Rosenberg's (1965) SE scales, but it significantly correlated with Tafarodi and Swann's (1995) self-liking scale, a theoretically constructed measure of self-worth. The ISL and its twin index of Implicit Self-Confidence correlated with theoretically derived markers of implicit SE, initial letter

preferences (Nuttin, 1987), and self-positivity projection (Greenwald & Banaji, 1995), whereas none of the questionnaires did (Aidman, 1999).

The following experiment examined whether individuals with genuinely high SE would show lower levels of distress and more constructive response to an artificial negative feedback on a mastery task, compared to people with low or mixed SE. In particular, individuals who demonstrate both high implicit and high explicit SE were expected to experience less negative mood (operationalized as Self-Apperception Test-measured pre- and postfeedback mood swing) after receiving negative feedback, as well as reporting less disliking for the bearer of the feedback. The experiment also served to cross-validate the new measures of implicit SE derived from the IAT and Self-Apperception Test, respectively.

METHOD

Participants

A total of 63 first year university students (38 women and 25 men), enrolled in undergraduate psychology courses at the University of Ballarat (Victoria, Australia), aged between 18 and 55, participated in return for partial course credit.

Materials

Implicit Measures

Implicit Association Test. The IAT (Greenwald et al., 1998) was used in its form adapted to the measurement of SE (Greenwald & Farnham, 2000). IAT treats SE as a special form of implicit attitude by assessing the automatic association between the self and a positively valenced attribute (e.g., pleasant). The core of the method is a speeded semantic discrimination task: The participant is presented with a target word (e.g., a name) in the middle of the computer screen and instructed to categorize it into one of two categories (i.e., *me-not me* or *pleasant-unpleasant*) by pressing as fast as possible the designated response keys on the keyboard (usually, letter *A* for the left-hand (LH)-side response and number *5* on the numeric pad for the right-hand (RH)-side response). The attribute-concept associations are assessed by combining a target-concept discrimination task (e.g., *me-not me*) with an attribute discrimination (e.g., *pleasant-unpleasant*) task. It is an assumption of the IAT that the simultaneous presentation of two such tasks should make strongly associated (compatible) attribute-concept pairs easier to classify when their responses are mapped on the same response keys. Therefore, when highly associated categories (e.g., *me* and *pleasant*) require the same response, the response time should be faster than when contrasting categories (e.g., *me* and *unpleasant*) share the same response key.

We chose the idiosyncratic version of SE IAT (Greenwald & Farnham, 2000), which requires the participant to generate *me-not me* words for the target-concept discrimination task. Twelve *me* words were thus generated, including names, dates, and places that the participants strongly associated with (i.e., their first and last names, birthday, hometown, etc.). Twelve *not me* words were generated using the following criteria: (a) The participant does not associate him- or herself with the word (e.g., other names, places, or dates); (b) what the word represents is familiar but neither liked nor disliked (Farnham et al., 1999). Participants were then required to review the item lists and delete any items that did not appear to fit the respective *me* and *not me* categories. A minimum of 5 and a maximum of 12 words were left to ensure that the *me-not me* discrimination task was straightforward and unambiguous.

The second, attribute discrimination task requires the participants to discriminate between words with positive and negative valence. The pleasant and unpleasant word categories included 15 words each (e.g., *caress* or *cuddle* vs. *assault* or *death*) and were identical to those used by Greenwald et al. (1998), except participants were allowed to delete words from these lists if they did not perceive them fitting. For example, the participant had the option of removing the word *death* from the unpleasant list if he or she did not see it particularly unpleasant. A minimum of 5 and a maximum of 15 words were thus left in each list. At the conclusion of this phase two word lists were idiosyncratically generated to represent the target-concept discrimination (*me-not me*), and two word lists representing the attribute dimension (*pleasant-unpleasant*) were adjusted by the participants to meet their idiosyncratic preferences.

As illustrated in Table 1, participants first practiced the initial target-concept discrimination between *me* and *not me* words. Second, the attribute discrimination between *pleasant* and *unpleasant* words was practiced. Then the above two discrimination tasks were combined: Both pairs of category labels appeared on either the LH or RH side of the screen simultaneously; and target words were randomly selected from either *me-not me* or *pleasant-unpleasant* word lists and exposed one at a time in the middle of the screen. This combined task was administered twice: first with *unpleasant* and *me* categories on the RH side of the screen, and *pleasant* and *not me* categories on the LH side, and then with the attribute category pair reversed on the screen (see Greenwald & Farnham, 2000).

The generic prediction is that, given the instruction to respond with maximum speed and accuracy, response times in combined tasks will depend on how compatible the categories on each side of the computer screen are (Greenwald et al., 1998). Specifically, the *me-unpleasant* combination was shown to produce slower response times than the *me-pleasant* one (Farnham et al., 1999). Further, the difference in response times between the two combined tasks (the initial and the reversed one) were shown to vary substantially across the sample, representing the underlying individual differences in the corresponding

TABLE 1
Tasks for the Assessment of Implicit Self-Esteem

<i>Left-Hand Response Category</i>	<i>Categorization Target Word Presented One at a Time, Randomly Selected From:</i>	<i>Right-Hand Response Category</i>
Practice Block 1 (20 trials) Me	Either the "me" or "not me" list generated by the respondent (e.g., first name)	Not me
Practice Block 2 (20 trials) Pleasant	Either the "pleasant" (e.g., cuddle) or "unpleasant" (e.g., abuse) list trimmed by the respondent	Unpleasant
Measurement Block 1 (40 trials) Me Pleasant	From any of the four lists above	Not me Unpleasant
Practice Block 3 (20 trials) Unpleasant	From any of the four lists above Identical to practice Block 2, except the position of the valence categories are reversed	Pleasant
Measurement Block 2 (40 trials) Me Unpleasant	Identical to measurement Block 1, except the position of the valence categories are reversed	Not me Pleasant

Note. IAT = Implicit Association Test.

implicit SE construct (Farnham et al., 1999). This response time difference, or the IAT effect (Greenwald et al., 1998), essentially constitutes an estimate of the participant's implicit SE level. Farnham et al.'s (1999) study showed that this measure is correlated with in-group (gender) favoritism, which confirms initial construct validation of IAT as a measure of individual differences in implicit SE.

Farnham et al. (1999) found that the order in which the two combined blocks are presented in the IAT procedure influences the magnitude of the IAT SE effect: The difference in response latency tends to be consistently larger when the *me-pleasant* combination is presented first (followed by *me-unpleasant*), and diminishing when the *me-unpleasant* combination is presented first (followed by *me-pleasant*). Between-subject counterbalancing used by Greenwald et al. (1998) compensates for this order effect at a group analysis level—but not at the level of individual differences. Therefore, a fixed sequence of *me-pleasant* combination followed by *me-unpleasant* was chosen for this study, as it was expected to amplify the IAT SE effect rather than randomly distorting it.

Self-Apperception Test. The Self-Apperception Test (Aidman, 1999) uses a methodology of semiprojective visual scaling to estimate implicit SE. The Self-Apperception Test requires respondents to sort 10 schematic facial sketches along a continuum from *like the face* to *dislike the face*. First, one face is placed under the verbal anchor *like the face*, and one face is placed under the verbal anchor *dislike the face*. The remaining eight faces are placed to fill the order between these two extremes. Once this task is completed, respondents sort the same faces three more times, with the verbal anchors presented in the following order: *happy* versus *sad*, *strong* versus *weak*, and *most like me* versus *most unlike me*. Spatial positions of each of the 10 faces between the anchors are translated into ranks from 1 to 10 for each of the scales used in the procedure. There are two groups of scales: the first scale, *most liked* [face]–*most disliked* [face], and the last scale, *like me*–*unlike me* are called *base scales* as they form the core of the procedure. The other two scales are referred to as *attribute scales*.

The generic quantification of implicit self-appraisal in this procedure is transparent: The similarity between the rankings on the two base scales reflect the overall feeling of self-worth (Liggett, 1959) and is theoretically similar to the IAT SE effect. On the other hand, similarities between any attribute scale and the *like me*–*unlike me* scale reflect the specific implicit self-appraisal on the construct anchoring the attribute scale (Aidman, 1999). Furthermore, similarities between attribute scales and the first base scale, *most liked* [face]–*most disliked* [face], reflect valences, or implicit values, the participant places on the respective anchor constructs (Aidman, 1999).

The ISL is computed as Spearman's rank order correlation between the two base scales (*like me*–*unlike me* and *like the face*–*dislike the face*) for each individual participant separately. ISL has been shown to have acceptable internal consistency and retest reliability estimates ranging between .57 and .84 for 2-week and 2-hr intervals, respectively (Aidman, 1999), as well as growing evidence of construct validity (Aidman & Perry, 2000; Meagher & Aidman, 2001). In particular, although low-to-negligible correlations with SE questionnaires (Aidman, 1996, 1999; Tallent & Aidman, 1995) have confirmed the discriminant validity of the Self-Apperception Test as measuring a construct distinct from explicit SE (Greenwald et al., 1998), its convergent validity has been demonstrated through associations with theoretically derived markers of implicit SE—Nuttin's (1987) initial letter preferences effect and self-positivity projection (Aidman, 1999)—as well as with failure-induced variation in performance and mood fluctuations in a simulated social interaction task (Aidman & Harmer, 2003).

The added advantage of the Self-Apperception Test is that it provides two measures of interest within this study. The ISL index is theoretically similar to the IAT SE effect. On the other hand, the implicit self-appraisal of mood, estimated through the *happy*–*sad* attribute scale, and coupled with the repeated pre- and posttreatment administration of the Self-Apperception Test, allowed us to ascer-

tain the change in the participant's implicit self-appraisals of mood that resulted from the experimental manipulation.

Explicit SE measure. The Self-Liking/Self-Competence Scale Revised (SLCS-R; Tafarodi & Swann, 2001) is a 16-item self-report scale that was modified from the 20-item Self-Liking/Self-Competence Scale (Tafarodi & Swann, 1995). The SLCS-R is a robust, straightforward, and economical measuring instrument, which uses a content- and context-free approach to measure explicit SE (Rosenberg, 1965, 1979). The scale consists of two subscales, self-liking (SL) and self-competence (SC). Each of the two eight-item subscales contains four positively worded items and four negatively worded items. Scale items include questions such as "I tend to devalue myself" (self-liking), and "I perform very well at many things" (self-competence). Items are rated on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Both the SL and SC subscales have demonstrated moderate to high internal consistency ($\alpha = .82$) and ($\alpha = .90$), respectively. Three-month test-retest coefficients for SC ($r = .78$) and SL ($r = .75$) indicate considerable stability of the scales. Strong convergent and discriminant validity in a multiple reporter context has been demonstrated for both SLCS-R subscales (Tafarodi & Swann, 2001). Adequate discriminant validity, for the two highly correlated constructs, self-liking and self-competence, was confirmed using the SLCS-R (Tafarodi & Milne, 2002). Advantages of the SLCS-R over the earlier version (Tafarodi & Swann, 1995) include lower subscale intercorrelation and lower subscale means. Although elevated mean scores are not atypical for SE measures (Taylor & Brown, 1988), the latter change provides greater normality and centering of score distributions.

Procedure

The experiment was conducted individually, face-to-face, by a male researcher who was assisted by either a male or female confederate to ensure maximum realism in the delivery of feedback. Each participant was tested in a single session of between 45 and 60 min. After being greeted by the researcher in a small laboratory room with a desktop PC, participants were introduced to the confederate. The confederate was introduced as "assistant, responsible for monitoring and storing the data on the computer in the next room." The confederate proceeded to the next room and was not present at the time of testing. To control for the possible impact of gender perceptions, half the participants were introduced to a male assistant, whereas the other half were introduced to a female assistant. This procedural factor was controlled for in all relevant data analyses.

Stage 1 of testing involved the administration of the IAT and Self-Apperception Test. The order of administration of these two implicit measures was counterbalanced to control for ordering effects. After each of the two tests were completed,

the confederate was notified that the data were available for analysis. After a short period of 15 to 20 sec, the confederate entered the room and offered mild verbal encouragement to the participant by saying "well done."

Stage 2 of testing involved participants completing the Mimix simulation (Aidman & Schmelyov, 2002), which they were introduced to as a test of social competency. The Mimix task involves a computer game-like scenario that essentially requires participants to alter the facial expression of their avatar to negotiate with a number of other characters on screen in order for them to allow the avatar to pass on its journey through a matrix maze. The object is to get from the bottom LH corner of the matrix to the top RH corner where the avatar receives a reward and is allowed to proceed to the next level. The game is designed on a 9×9 matrix layout with 3×3 cells viewable by the participant at any one time (Aidman & Schmelyov, 2002). For the purpose of this study, the Mimix task was used as a vehicle to engage participants in a mastery task and to provide them with artificial but plausible negative feedback on that task. The last instrument to be completed was SLCS-R, after which the confederate reentered the room and spoke directly to the participant providing him or her with the same feedback irrespective of his or her performance on the Mimix task. Participants were told they had failed a test of social competency embedded in Mimix. The confederate then left the room and the Self-Apperception Test was re-administered. Following the second administration of the Self-Apperception Test, participants rated their attitude toward the assistant. This rating ranged from 1 (*very much* [liked]) to 4 (*not* [liked] *at all*) and represented a measure of "explicit disliking for the bearer of negative feedback"—one of the two operationalizations of emotional response to feedback employed in this study.

RESULTS

IAT Data Reduction

The IAT SE effect was computed from the data obtained in the last two 40-trial data-collection blocks presented in Table 1. Consistent with procedures introduced by Greenwald et al. (1998), the following initial transformations were conducted: (a) The first two trials of each data-collection block were dropped because of their typically lengthened response times, (b) a logarithm transformation was used to normalize the distribution of response times; (c) prior to this transformation, response times greater than 3,000 msec were recoded to 3,000 msec and response times less than 300 msec were recoded to 300 msec. Alternative treatments of outlying trials, such as using different boundaries to identify outliers, excluding them entirely, or even keeping them in the data set, had no substantial impact except to add additional noise to the findings. One participant, whose error rates for data-collection blocks of the IAT exceeded 20%, was considered for exclusion

from the analyses. The exclusion did not substantively alter the subsequent results. Given that the participant's response times were well within range for the sample distribution, it was decided to keep the data intact. The IAT SE effect was then computed—separately for each participant—as Cohen's measure of effect size (d) based on log-transformed response times between the two critical trial blocks.

Aggregation of Self-Apperception Test Data

The ISL was computed as Spearman's rank order correlation of the *like me-unlike me* scale with the *like the face-dislike the face* attribute scale. Two self-appraisal indexes were computed as Spearman's rank order correlations of the *like me-unlike me* scale with the two attribute scales (*happy-sad* and *strong-weak*). In addition, Spearman's rank order correlations between the same attribute scales and the *like the face-dislike the face* scale produced valence estimates for the constructs represented by the attribute scales (*happy-sad* and *strong-weak*). With the exception of the latter valence indexes, all Self-Apperception Test indexes are known to be relatively unstable (Aidman, 1999; Aidman & Perry, 2000). On the other hand, aggregation of Self-Apperception Test indexes has been found to improve the reliability of the resulting measure (Aidman & Hjorth, 2003). In view of this evidence, all five Self-Apperception Test indexes (ISL, two self-appraisal and two valence indexes) were aggregated in a composite Implicit Self-Positivity scale, with a Cronbach's alpha of .74 on this sample, indicating an acceptable level of internal consistency. Further analysis revealed that within this composite scale, a subset of indexes, composed of implicit self-appraisal and valence of strength, is both reliable (Cronbach's alpha of .83 on this sample) and meaningful (interpretable as implicit self-confidence).

Associations Between Measures

Table 2 presents the correlations between SE measures used in this study and measures of response to feedback: IAT effect (Cohen's d computed on log-transformed response latencies), two Self-Apperception Test indexes of Implicit Self-Confidence and Composite Implicit Self-Positivity, and two scale scores from the SLCS-R questionnaire—Self-Liking and Self-Competence. Also present are two measures of reaction to feedback, assistant liking-disliking rating, and pre- and postfeedback mood shift. This counterposition of variables reveals an interesting pattern of correlations. First of all, the respective pairs of SLCS-R and Self-Apperception Test measures of SE are, predictably, highly intercorrelated, $r(63) = .71$ and $r(63) = .69$, respectively, both $ps < .001$. Second, all three methods have produced measures that are weakly but significantly and meaningfully associated. Whereas IAT effect did not directly correlate with SLCS-R, it significantly correlated with Self-Apperception Test's implicit self-confidence index, $r(63) = .280$, $p < .05$. Self-Apperception Test's composite self-positivity

TABLE 2
Correlations of Implicit and Explicit Self-Esteem With Measures of
Feedback Sensitivity

Variables	1	2	3	4	5	6	7
Implicit self-esteem							
IAT: Log-transformed Cohen's <i>d</i>		.280**	.181	-.033	-.001	-.168	.176
SAPt: Implicit self-confidence			.689***	.135	-.012	-.003	-.065
SAPt: Composite implicit self-positivity ($\alpha = .74$)				.262**	.101	-.019	.257**
Explicit self-esteem (SLCS-R)							
Self-liking					.712***	-.265**	-.106
Self-competence						-.222*	.002
Reaction to feedback							
Assistant ratings							.108
Post-feedback mood shift	1	2	3	4	5	6	7

Note. $N = 63$. IAT = Implicit Association Test; SAPt = Self-Apperception Test; SLCS-R = Self-Liking/Self-Competence Scale Revised.

* $p < .10$. ** $p < .05$. *** $p \leq .001$.

index is, in turn, significantly associated with the SLCS-R measure of explicit self-liking, $r(63) = .262, p < .05$. The same Self-Apperception Test index significantly correlated with pre- and postfeedback mood shift, $r(63) = .257, p < .05$, whereas explicit self-liking correlated with the ratings of assistant disliking, $r(63) = -.265, p < .05$. Both correlations are in the predicted direction, indicating that higher implicit SE may be predictive of more positive emotional response to feedback, whereas higher explicit SE is associated with lesser disliking for the bearer of negative feedback. Examining these preliminary associations separately, however, does not tell the full story; it is necessary to determine how these measures interact with one another in predicting reactions to negative feedback. We did that through a series of analyses of variance (ANOVAs).

Effects of Negative Feedback

The influence of implicit and explicit SE on the magnitude of cognitive and affective response to feedback was examined through a series of analyses of covariance (ANCOVAs). Both the Self-Apperception Test- and IAT-derived estimates of implicit SE, as well as SLCS-R subscales were categorized using median splits of their respective distributions. Alpha levels of .05 were used for all statistical tests, and no violations of assumptions of normality, linearity, and homogeneity of variances were observed.

Implicit self-appraisal of mood. The immediate emotional response to negative feedback was operationalized as a pre-post feedback change in

Self-Apperception Test-derived implicit self-appraisal of mood (on the *happy-sad* scale). Preliminary analysis indicated a significant covariance between this outcome measure and the assistant's gender. Consequently, a repeated measures ANCOVA was used, controlling for the gender of the assistant. The three independent SE factors were defined as high- and low-scoring groups on the Self-Apperception Test (composite implicit self-positivity), IAT SE effect, and SLCS-R (total score). Results revealed a significant main effect of IAT-estimated SE on the participant's pre- and postfeedback mood shift. Figure 1 illustrates the mean pre- and postfeedback implicit self-appraisal of mood scores for those high and low on IAT. As can be seen in Figure 2, Self-Apperception Test-derived implicit self-appraisal of mood was identical in both high- and low-IAT scoring groups during the pretest, prior to their exposure to negative feedback. In the posttest, it was considerably higher for high IAT scorers and lower for low IAT scorers, with highly significant differences between the two groups at this second data point, $F(1, 54) = 6.62, p = .013$. Within-subjects differences on the same mood shift observed for high and low scorers on either the Self-Apperception Test, $F(1, 54) = 2.72, p = .105$, or the SLCS-R, $F(1, 54) = 3.39, p = .071$, were not significant, although both were in the predicted direction and thus can be considered as tendencies.

A significant interaction was observed between explicit (SLCS-R) and implicit (IAT) SE influencing the mood shift, $F(1, 54) = 5.34, p = .025$. Figure 2 displays the interaction between high and low implicit (IAT) and explicit (SLCS-R) SE. This interaction represents quite a meaningful finding: It suggests that the higher the SE, the more positive is the change in postfeedback implicit self-appraisal of mood, with the most positive mood outcomes achieved by those high on both implicit (IAT) and explicit (SLCS-R) SE. Only those low on both SLCS-R and IAT demonstrated a decrease in postfeedback implicit self-appraisal of mood, suggest-

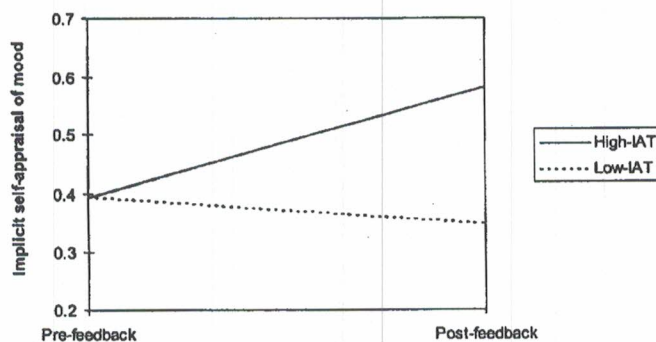


FIGURE 1 Mean pre- and postfeedback implicit self-appraisal of mood scores for high and low IAT scorers.

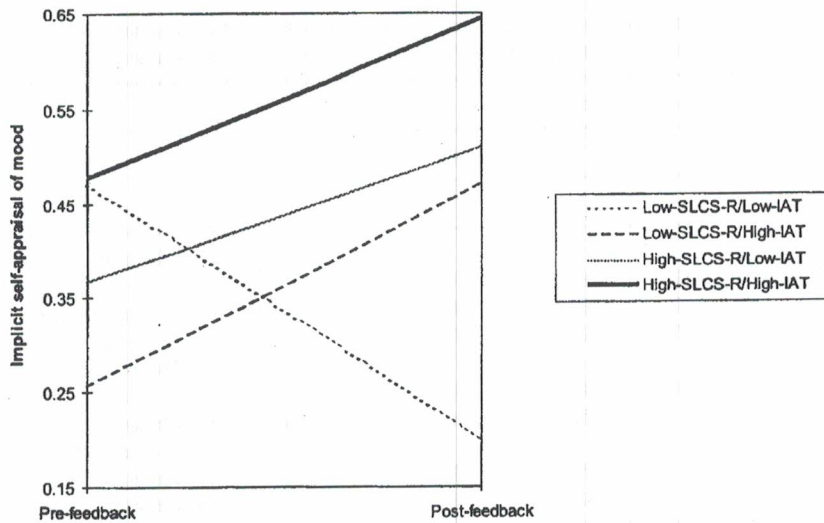


FIGURE 2 Mean pre- and postfeedback implicit self-appraisals of mood as a function of explicit (SLCS-R total score) and implicit (raw IAT effect) SE.

ing that either high implicit or high explicit SE was sufficient to avoid a decline in postfeedback implicit self-appraisal of mood.

Disliking of assistant. Preliminary analysis showed no significant covariance of either participant or assistant gender with *disliking of assistant* ratings. Initially, the potentially different roles of declared self-liking and self-competence as components of explicit SE in predicting the assistant ratings were examined. The respective SLCS-R subscale scores were categorized into high- and low-scoring groups and used as factors in a 2 (high–low self-liking) \times 2 (high–low self-competence) factorial ANOVA, which revealed a strong main effect of self-liking, $F(1, 59) = 12.07, p = .001$, but no effect of self-competence, $F(1, 59) = .20, p = .63$, on participants' disliking of the assistant. Examination of the means revealed that high declared self-liking scorers (SL) reported less disliking for the assistant ($M = 1.66, SD = .75$) than did low SL scorers ($M = 2.30, SD = .66$), whereas there was no significant difference in assistant ratings between high ($M = 1.79, SD = .74$) and low ($M = 2.10, SD = .80$) self-competence scorers (see Table 3). This finding suggests that explicit SE does have an influence on cognitive response to feedback, but this influence is driven by only one of its distinct components—that is, feelings of self-worth (self-liking)—whereas explicit self-competence does not contribute to it. Consequently, explicit self-liking scores were used as representing explicit SE in the following analyses.

A 2 (high–low explicit self-liking) \times 2 (high–low IAT-derived implicit SE) \times 2 (high–low Self-Apperception Test-derived implicit SE) factorial ANOVA revealed

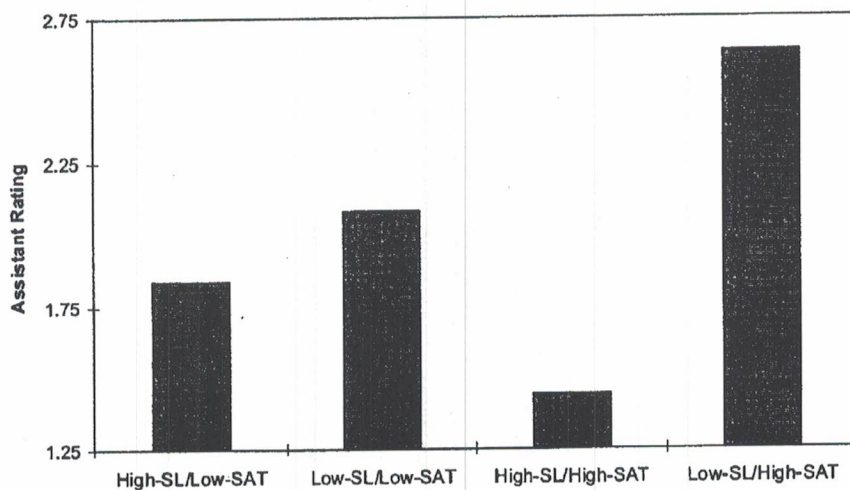


FIGURE 3 Mean ratings of disliking for the bearer of negative feedback as a function of explicit (SLCS-R self-liking score) and implicit (Self-Apperception Test composite index) SE.

and high explicit SE showed less negative mood after receiving a negative feedback, as well as less disliking for the bearer of that feedback, compared to people with low or mixed SE. In particular, emotional response to negative feedback (measured as pre- and postfeedback mood shift) was strongly influenced by implicit SE (IAT effect); but its relation with explicit SE was more indirect and showing through only in interaction with implicit SE. This significant interaction between implicit (IAT) and explicit (SLCS-R) SE influencing the mood shift indicates that (a) only those participants who were low on both implicit and explicit SE suffered negative mood shifts after the feedback, and (b) either high implicit or high explicit SE was sufficient to avoid a decline in postfeedback implicit self-appraisal of mood. This suggests that any one positive element of SE—either implicit or explicit—may provide sufficient protection from maladaptive emotional responding to negative feedback. This interpretation is consistent with negative associations between SE and such maladaptive reactions as depression (Day, Kane, & Roberts, 2000) and psychological defense (Norem, 2001).

The level of disliking for the bearer of negative feedback was found to be strongly predicted by explicit SE (SLCS-R), but the influence of implicit SE (IAT effect) was substantially weaker. Interestingly, only one of the two components of explicit SE—explicit self-liking—was responsible for the effect, whereas explicit self-competence did not influence the ratings of the negative feedback bearer. As predicted, high explicit self-liking scorers reported significantly less disliking for

the assistant than did low scorers. Self-Apperception Test measures of implicit SE did not influence the ratings directly, but a significant interaction between the Self-Apperception Test and explicit self-liking indicated that explicit self-liking affects the ratings of disliking for the bearer of negative feedback only in those participants who are high on Self-Apperception Test-estimated implicit SE.

The overall pattern suggests that implicit SE (on its own) was more strongly related to mood change and explicit SE (on its own) was more strongly related to assistant dislike, but it was their combined influence that seemed to be the best predictor of both kinds of behavior. The four possible combinations of explicit and implicit SE have produced distinct patterns of response to negative feedback, which go beyond what is known in the literature. Previous research comparing self-report with more covert measures (e.g., Shedler, Mayman, & Manis, 1993) often reveals three, rather than four, groups, corresponding to the high explicit-high implicit ("double-highs"), low explicit-low implicit ("double-lows"), and high explicit-low implicit, but rarely the low explicit-high implicit SE. This latter group was well defined in our experiment, and interestingly enough, relative to all other groups its members disliked the assistant the most. This finding is consistent with the pattern of "defensive pessimism" (Norem, 2001), although exactly why the combination of low explicit and high implicit SE should lead to such a negative response remains to be examined.

More generally, why should implicit and explicit measures have a combined influence on reactions to negative evaluations? There is no existing theorization on the matter, but on the basis of differential associations of explicit and implicit SE with the rational and experiential information processing systems assumed in CEST (Epstein & Morling, 1995), one might expect that explicit SE should have a stronger influence on consciously controlled, rational behaviors, and implicit SE should have greater impact on automatic, schemata-driven behaviors. Given that in reality our reactions to negative evaluations will contain both rational and automatic elements in various proportions, the influence of explicit and implicit SE on these reactions can be expected to be combined, as well as reflecting those proportions.

As hypothesized, the associations between implicit and explicit SE were weak but meaningful. In particular, no IAT-derived measures of implicit SE correlated with SLCS-R, which is consistent with existing empirical findings (Farnham et al., 1999; Fazio, Jackson, Dunton, & Williams, 1995), and supports earlier theorizing (Greenwald & Banaji, 1995) that implicit and explicit SE may be two distinct measurement constructs. The weak but significant association between Self-Apperception Test-derived implicit self-liking and SLCS-R is consistent with Aidman's (1999) initial validation of the Self-Apperception Test and may be indicative of an intermediate status of Self-Apperception Test measures on a continuum between self-report questionnaires and response latency-based measurement.

Support was found for explicit SE (self-liking subscale of SLCS-R) as a predictor of the level of disliking for the bearer of negative feedback. This is consistent with the earlier findings of Hewitt and Goldman (1974) who reported liking for the bearer of feedback to be dependent on the participant's level of self-reported SE. It was hypothesized that high and low implicit SE would also affect participant's disliking for the bearer of negative feedback in line with the theorizing of Farnham et al. (1999), with high implicit and explicit self-esteemers viewing the bearer of negative feedback more favorably than low implicit and explicit self-esteemers. Neither of the implicit measures showed any main effects, which is inconsistent with this hypothesis. This further confirms that SLCS-R-derived estimates of explicit SE best predict the participant's explicit sensitivity to negative feedback operationalized through the assistant ratings questions.

The implicit measure of participant's emotional response to feedback, on the contrary, was associated with implicit SE, with high and low IAT scorers differing significantly on change in implicit self-appraisals of mood. This finding supports James's (1890) proposition that a person with genuine high SE should be able to receive negative feedback without finding it too painful. In predicting participant's sensitivity to negative feedback, a theoretically related behavior, weight of evidence pertaining to the IAT's construct validity is increased (Farnham et al., 1999). This provides support for the IAT as a predictor of the magnitude of emotional response to negative feedback. More specifically, this suggests that implicitly derived judgment latency estimates of SE best predict implicit estimates of sensitivity to feedback operationalized as Self-Apperception Test-derived implicit self-appraisals of mood. Neither Self-Apperception Test-derived implicit self-liking nor SLCS-R showed any influence on this outcome variable. One of the most interesting findings pertains to the interaction between implicit SE (IAT) and explicit SE (SLCS-R) influencing emotional impact of feedback as measured by the Self-Apperception Test. Analysis of this interaction demonstrated the pivotal role of the combination of implicit and explicit SE in protecting the person from the impact of negative feedback. The only group negatively affected by the feedback was those who were low on both implicit and explicit SE. This finding is consistent with Farnham et al.'s (1999) suggestion that those high on both implicit and explicit SE would be least sensitive to negative feedback. This also supports James's (1890) proposition that genuinely low self-esteemers would be most significantly affected by the negative feedback. Our results do, however, suggest that either high implicit or high explicit SE is sufficient to avoid negative affective reactions to feedback. Participants who were high on both implicit and explicit SE had the most positive self-appraisal of mood in the pretest and increased it further in the posttest. Only those who were low in both implicit and explicit SE showed a decline in self-appraisal of mood following the negative feedback. The counterintuitive increase in implicit self-appraisal of mood observed in our experiment—despite the negative feedback—may suggest that our experimental manipulation was not suc-

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