Implicit Self-Attitudes Predict Spontaneous Affect in Daily Life

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In 2 studies, the authors examined the degree to which implicit self-attitudes predicted people's spontaneous affective experiences in daily life. Across both studies, implicit attitudes toward the self (as measured by Implicit Association Tests) strongly predicted negative feeling states (as measured by computerized experience-sampling procedures), suggesting that implicit self-attitudes may be linked to changes in undifferentiated negative affect. Explicit attitudes toward the self generally did not account for these relations. Findings extend understanding of the factors that contribute to experienced affect and are the first to empirically link implicit self-attitudes with phenomenological affective experience in real-life settings over time.

Keywords: implicit social cognition, implicit attitudes, emotional states, self-esteem, experience sampling

The experience of emotion is fundamental to understanding the human condition and central to a range of topics in psychological science. Feelings are a window into the psychological impact of events in our lives and serve as important markers of mental health. Given their importance, it is crucial to understand the factors that account for why people differ in their emotional lives. Why does one person feel anxious and threatened, whereas another feels relaxed and happy? Because many of our mental processes occur automatically (Bargh, 1994), often outside our awareness (Gazzaniga, 1998; Kihlstrom, 1987; Nisbett & Wilson, 1977; Wilson, 2002), it stands to reason that automatic processing tendencies play an important role in the quality or content of what we feel. This report examined how one such factor—implicit attitudes about the self—predicts momentary experiences of affect, as measured in everyday life.

Implicit Self-Attitudes

People evaluate and form attitudes about most objects in the world (Fazio, 2001), including about ourselves. Although it was once assumed that all self-attitudes were explicit (i.e., directly measurable by means of self-report), it is now known that we possess attitudes about ourselves that are implicit, measurable indirectly using procedures that bypass self-report (Fazio & Olson, 2003; Greenwald & Banaji, 1995; Hetts & Pelham, 2001; Wilson, Lindsey, & Schooler, 2000). These indirectly measured attitudes, commonly referred to as implicit self-attitudes or implicit self-

esteem (Farnham, Greenwald, & Banaji, 1999), are thought to reflect traces of early experiential learning whereby we automatically learn to associate our self-concept with positivity or negativity through covariations in experience (Banaji, 2001; Karpinski & Hilton, 2001; Olson & Fazio, 2001, 2002; Rudman, 2004). Although there is debate as to whether or not people are consciously aware of their implicit self-attitudes (Fazio & Olson, 2003; Greenwald & Banaji, 1995; Wilson et al., 2000), there is evidence to suggest that people cannot introspect on these attitudes. What people directly report about themselves and what is revealed using implicit measures often do not correlate, even when taking into account people's motivations to conceal negativity in their self-reports (i.e., because of self-presentational concerns; Egloff & Schmukle, 2003).

Implicit self-attitudes, like other implicit attitudes, are akin to implicit processing tendencies. They become activated automatically in self-relevant situations to influence more spontaneous and less controllable outcomes (Greenwald & Banaji, 1995). For example, there is a small but growing body of research showing that implicit self-attitudes predict nonverbal behavior in self-evoking situations (e.g., Asendorpf, Banse, & Mücke, 2002; Spalding & Hardin, 1999) as well as spontaneous self-evaluations when made under conditions of reduced cognitive capacity (Koole, Dijksterhuis, & van Knippenberg, 2001). In essence, these findings parallel findings from other implicit attitude research showing, for example, that implicit attitudes toward social groups predict interpersonal nonverbal behaviors (e.g., toward African Americans; Fazio, Jackson, Dunton, & Williams, 1995; McConnell & Leibold, 2001) as well as spontaneous gut reactions (e.g., toward gays; C. T. Smith & Nosek, 2005). In this study, we sought to build on this literature by investigating whether implicit self-attitudes would also predict people's spontaneous, affective experiences as measured in real-life settings over time.

Implicit Self-Attitudes and Affect

Implicit attitudes toward the self should play an important role in people's emotional lives. The self and emotion are tightly linked (Lambie & Marcel, 2002). According to appraisal models of

emotion, people continually and automatically appraise situations for their value to the self (whether situations will help or hinder; whether they are positive or negative; Lazarus, 1966; Mandler, 1984; Ortony, Clore, & Collins, 1988; C. A. Smith & Ellsworth, 1985). Indeed, the primary appraisal process is thought to be the first step in the generation of an emotional response. Automatic processes, like primary appraisals, are known to tap implicit memory sources (E. R. Smith & DeCoster, 2000), and so implicit self-attitudes should affect primary appraisal. When encountering an event, situation, or other stimulus, individuals with more negative implicit views of self may be more likely to appraise the situation as harmful to the self, which, in turn, will lead to more negatively toned emotional experience. When engaged in the same process, individuals with more positive implicit views of self may appraise less threat, thereby leading to less negative, or perhaps more positive, emotional experience. In this way, past affective experiences involving the self may guide our affective reactions to events in the current environment.

To date, very little empirical work has addressed the link between implicit self-attitudes and affect. The majority of research has focused on explicit attitudes, which show strong links with positive and negative affect, as well as affect regulation strategies (reviewed in Baumeister, 1998; J. D. Brown & Mankowski, 1993; Kernis, Brockner, & Frankel, 1989; Moreland & Sweeney, 1984). Although these are important findings, they tell us little about the possible relation between implicit self-attitudes and affect. Implicit and explicit self-attitudes, like other "dual attitudes" (Wilson et al., 2000), are considered different constructs. They are measured differently, they predict different behavior, and they are often uncorrelated. Given their distinctiveness, it is not known whether implicit self-attitudes will predict the same or different patterns as do explicit self-attitudes and whether implicit self-attitudes will predict variance in affect above and beyond what is predicted by explicit attitudes alone.

There has been some research investigating links between implicit self-attitudes and affect, with promising results. In a series of experiments by Dijksterhuis (2004), a subliminal conditioning procedure was used to manipulate implicit attitudes about the self. Half of the participants received positive self-conditioning (self words paired with positive stimuli), whereas the other half received no self-conditioning (nonself words paired with positive stimuli; only positive conditioning was used for ethical considerations). This manipulation was shown in pretest to boost implicit self-attitudes as measured by standard indirect measures (the Implicit Association Test [IAT] and the Initials Preference Test). After this manipulation, participants received performance feedback and then reported on their affective state (i.e., how unpleasant to pleasant they felt; Study 5a). Results showed that temporarily boosting implicit self-attitudes changed people's affective state primarily by minimizing unpleasant feelings after negative feedback relative to nonconditioned controls. This manipulation did little to enhance feelings after positive feedback, suggesting a possible asymmetry in the effect of implicit self-attitudes that warrants further investigation. Overall, results strongly suggest that implicit self-attitudes affect how people appraise and feel in response to self-relevant situations.

Given the promise of findings by Dijksterhuis (2004), we sought to examine the broader implications of implicit self-attitudes for our emotional lives. If implicit self-attitudes shape how people feel after one-time events in the lab, then implicit self-attitudes should be an important predictor of how people feel in real-world settings, when faced with numerous situations of a self-relevant nature. Thus, we hypothesized that implicit self-attitudes will predict how people spontaneously feel as they go about their daily lives, as measured by frequent and repeated probes of their affective state.

We also hypothesized that implicit self-attitudes would predict undifferentiated affective experience (i.e., feelings of negativity or positivity) rather than particular emotions per se (e.g., feeling angry, sad, or enthusiastic). This hypothesis derives from research on core affect. Core affect is like a barometer of an individual's relationship to his or her environment at that point in time (Russell, 2003; Russell & Barrett, 1999; Barrett, 2005). It reflects a primitive, undifferentiated feeling state that varies in terms of valence (feeling pleasant–unpleasant) and activation (feeling activated–deactivated). Primary appraisal processes are thought to change this core affective state. If implicit self-attitudes shape primary appraisal, then implicit self-attitudes should manifest in changes to this core affective barometer. Individuals who appraise a situation as more threatening because of an implicitly held self-attitude may experience a rise in feelings of unpleasantness. As a result, they might report feeling sad and angry and anxious to communicate what the emotion states have in common (feeling bad) rather than discrete emotion states per se (Feldman, 1995). If this perspective is correct, then implicit attitudes should predict range of like-valenced states in a generally undifferentiated fashion.

Overview

In two studies, we examined the predictive validity of implicit self-attitudes for people's spontaneous, affective experiences as reported over time in daily life. In both studies, participants completed indirect measures of self-attitudes (the IAT) as well as a self-report measure of explicit self-attitudes as a control (the Rosenberg Self-Esteem Scale [RSES]). The IAT (described later) was chosen over other measurement formats because it has good test–retest reliability and adequate predictive validity relative to other implicit self-attitude measures (for a review, see Bosson, Swann, & Pennebaker, 2000). Participants in each study also took part in a signal-contingent, computerized experience-sampling procedure to measure their momentary affect-related experiences on repeated occasions in daily life. In Study 1, participants rated their current experience of various emotion states 10 times daily for 28 days. Study 2 sampled a wider range of affect-related experiences to allow a broader test of the hypothesis. For both studies, we predicted that implicit self-attitudes, as measured by the IAT, would be related to the intensity of feelings over and above what was predicted by explicit self-attitudes alone. We also predicted that the links between implicit self-attitudes and affect would be relatively undifferentiated (i.e., the same across like-valenced states) and possibly stronger for negatively valenced states given previous research showing a stronger impact of implicit self-attitudes on negative affective reactions (Dijksterhuis, 2004).

Study 1

Method

Participants were 124 students (58 men and 66 women) ranging in age from 17 to 25 years ($M = 19$ years, $SD = 1.3$), who were paid $80 for their participation. Data were collected as part of a larger experience-sampling

study mapping the structure of momentary affective experience.[1] An identification number identified all materials.

At the first lab session, after giving informed consent, each participant completed a battery of questionnaire measures, which included the stimuli to be used in the IAT (see later description for more detail) and the RSES (Rosenberg, 1989). For the RSES, participants answered each of the 10 items on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Items asked about general evaluative feelings about the self, such as "I take a positive attitude toward myself" and "I feel that I am a person of worth, at least on an equal basis with others." An RSES index was calculated by summing the ratings across items (reversing negatively worded items); higher numbers indicated higher explicit self-esteem (α = .88). Raw scores ranged from 27 to 70 (*M* = 56.06, *SD* = 9.86). The distribution was negatively skewed and normalized by a square root transform.

Each participant was then issued a palm-top computer (Hewlett Packard 360 LX, Palo Alto, CA) and received instructions for the experience-sampling portion of the study, which lasted 28 days. Each computer was installed with the Experience Sampling Program (2.0b; Barrett & Barrett, 2001) and programmed to audibly signal participants 10 times per day, randomly within equal intervals between 9 a.m. and 11 p.m. At each signal, participants were asked to indicate how they felt at that moment by rating 29 emotion adjectives on 7-point scales (0 = *not at all*, 3 = *a moderate amount*, 6 = *a great deal*; see Table 1 for a list of terms). Affect terms represented all combinations of valence (pleasant–unpleasant) and arousal (high–low activation) dimensions of the affective circumplex (Feldman, 1995). Items were presented in a random order at each signal. Of 280 possible sampling moments (10 times/day for 28 days), the actual number of moments responded to ranged from 69 to 251 (*M* = 163, *SD* = 36), reflecting an average response rate of 60%, which is within norms for experience-sampling studies (Conner, Barrett, Bliss-Moreau, Lebo, & Kaschub, 2003).

One week into sampling, participants completed a computerized version of the IAT (Greenwald, McGhee, & Schwartz, 1998). We developed our IAT to measure the strength of association between the target concepts of *me* and *not me* and the evaluative concepts of *pleasant* and *unpleasant* (following other standard IAT protocols for measuring implicit self-esteem; Bosson et al., 2000; Greenwald & Farnham, 2000). Before completing the IAT, participants selected the stimuli that would be used in their procedure. First, they previewed eight pleasant and eight unpleasant evaluative words (e.g., health and agony) and selected only those that were unambiguously pleasant and unpleasant to serve as exemplars for those categories (from Greenwald & Farnham, 2000). Also, following Greenwald and Farnham (2000), we had participants idiographically select the word stimuli that would serve as exemplars for the me and not-me categories. Whereas Greenwald and Farnham included items such as the person's hometown, telephone number, and first and last names, along with other comparable items not associated with the individual's self-concept, we used items that we thought would be more powerfully linked to the self. Participants previewed a list of 98 neutral trait words (e.g., *opinionated*, *traditional*; Saucier, 1994) and selected a minimum of five traits that strongly described themselves ("me") and a minimum of five traits that did not describe themselves (i.e., were the opposite of who they are; "not me"). We selected these items to be normatively neutral in valence so that any facilitation or inhibition in response latencies would reflect the valence of the underlying implicit self-attitude.

The IAT was administered on an IBM-compatible desktop computer using Inquisit experimentation software. For training purposes, participants first completed a practice IAT involving standard categorization of flower and insect words with pleasant and unpleasant words (see Greenwald et al., 1998). After this task, participants began the tailored IAT, which consisted of four blocks of trials. In the first two blocks (with 20 and 40 trials), a word belonging to one of the four categories (me, not me, pleasant, unpleasant) appeared at the center of the screen, remaining there until the participant categorized it either as me or pleasant (paired on the same

Table 1

Patterns of Prediction for Emotions Sampled in Study 1

Emotion	Implicit		Explicit	
	Overall	Unique	Overall	Unique
Aroused	−.120	−.129	.009	.039
Surprise	.023	.053	−.114	−.126
Active	.132	.069	.286**	.270**
Alert	.086	.025	.269**	.263**
Peppy	.004	−.051	.226*	.238†
Interest	.143	.078	.299**	.281**
Joy	.022	−.036	.239**	.247**
Enthusiastic	.114	.062	.237*	.222*
Proud	−.011	−.066	.218*	.233*
Happy	.150	.056	.411**	.398**
Amused	.032	−.001	.142	.143
Satisfied	.119	.028	.396**	.389**
Calm	.172†	.122	.244**	.216**
Relaxed	.204†	.121	.382**	.354**
Quiet	.087	.127	−.141	−.170
Still	.094	.122	−.089	−.117
Sleepy	.040	.094	−.209*	−.231**
Sluggish	−.069	.011	−.341**	−.343**
Tired	.065	.130	−.247**	−.278**
Bored	−.185*	−.090	−.426**	−.405**
Sad	−.137†	−.056	−.358**	−.345**
Disappointed	−.180*	−.091	−.404**	−.383**
Ashamed	−.172*	−.109	−.297**	−.272**
Disgust[a]	−.222**	−.168**	−.328**	−.280**
Guilt	−.170*	−.111	−.281**	−.256**
Embarrassed	−.158*	−.086	−.325**	−.305**
Angry	−.205**	−.145**	−.293**	−.259**
Afraid	−.138†	−.060	−.346**	−.332**
Nervous	−.173†	−.082	−.408**	−.389**

Note. Emotions are presented in their clockwise order on the affective circumplex. Overall coefficients are similar to zero-order correlations and indicate the contribution of implicit or explicit self-attitudes to average momentary emotion states. Unique coefficients are the contributions of each self-attitude while controlling for the other. All coefficients are standardized.

[a] Disgust showed an interaction between implicit and explicit self-attitudes that almost reached significance. The unique coefficients for disgust were computed with the interaction term in the equation.

† *p* < .10.   * *p* < .05.   ** *p* < .01.

response key) or as not me or unpleasant (paired on another same-response key). The computer recorded the reaction times in milliseconds for each trial. In the second two blocks (with 20 and 40 trials), participants followed the same procedure except that *me* or *unpleasant* were paired together on the same response key and *not me* or *pleasant* were paired on the other response key. The order of the two pairings and side positioning of categories were counterbalanced across participants. We scored the IAT using standard protocol (see Greenwald, Nosek, & Banaji, 2003), which compared average response latencies in the me–pleasant (and not me–unpleasant) condition with average response latencies in the me–unpleasant (and not me–pleasant) condition. Faster response latencies in the me–pleasant condition relative to the me–unpleasant condition indicated a relatively more positive implicit self-attitude because there was a stronger association in memory between the self and positivity than between the self and negativity.

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[1] Study 1 data have been published elsewhere, but for testing hypotheses unrelated to implicit self-attitudes (i.e., examining the link between affective experiences and physiological sensitivity; Barrett, Quigley, Bliss-Moreau, & Aronson, 2004, Study 2).

Analyses and Results

Individuals in our sample, on average, held positive implicit self-attitudes, consistent with previous research using student samples (Bosson et al., 2000; Greenwald & Farnham, 2000; Koole et al., 2001). On average, people responded 534.57 ms faster to categorize stimuli when the me and pleasant categories were paired ($M = 1292.94$ ms) than when me and unpleasant categories were paired ($M = 1,827.51$ ms, $M_{diff} = -534.57$), $t(123) = -16.25$, $p < .01$. Nevertheless, there was significant variability in these differences, ranging from $-1,519.95$ to 432.21 ($M = -534.57$, $SD = 366.23$). Before analysis, signs were changed so that higher scores indicated more positive implicit self-attitudes.

All analyses used multilevel modeling procedures (HLM 5.04; Jöreskog & Sörbom, 2002). The present data set conformed to a multilevel data structure with emotion reports at the various time points serving as the lower level or within-subject unit, nested within individuals (who differed in their implicit and explicit self-attitudes) as the upper level or between-subjects unit. Multilevel modeling has several advantages over traditional methods of analyzing repeated measures data (like analyses of variance [ANOVAs]), including simultaneous estimation of within-subject and between-subjects variance, more efficient estimation of effects (e.g., by taking into account variability in the number of sampling moments obtained across participants), and lower Type I error rates (Krull & MacKinnon, 2001).

First, we tested the overall relation between implicit self-attitudes and the mean levels of emotional experience. For each of the 26 emotions, we ran one multilevel model that determined the mean intensity of emotion reported over time for each person (as a lower level effect) and simultaneously determined the extent to which scores on the IAT (as an upper level variable) predicted variability in these lower level means. Results are presented in Table 1. All coefficients represent the standardized final estimation of fixed effects with statistical significance computed using robust standard errors. Scores on the IAT significantly predicted primarily negative emotions in an undifferentiated fashion. Relative to those with negative implicit self-attitudes, individuals with positive implicit self-attitudes reported feeling less bored, disappointed, ashamed, disgusted, guilty, embarrassed, and angry and marginally less sad, afraid, and nervous. They also reported feeling somewhat more calm and relaxed.

We then tested whether these effects held when controlling for explicit self-attitudes. RSES scores were entered along with the IAT as a second upper level predictor. As can be seen in column 2 of Table 1, only two of the relations between implicit self-attitudes and experienced emotion remained statistically significant when scores on the RSES were entered as a covariate. Implicit self-attitudes continued to be a significant unique predictor of the two strongest negative emotions: anger and disgust. Although the other unique effects of implicit self-attitudes were still in the same direction, they no longer reached conventional levels of significance.

We hypothesized that these diminished unique effects may have resulted from shared variance between our implicit and explicit measures. The correlation between our measures was somewhat higher ($r = .23$, $p < .01$) relative to other published correlations, which range from nearly zero (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003) to .22 (Bosson et al., 2000). Our stronger correlation appears to have derived from our decision to use idiographic trait stimuli as exemplars for the me and not-me categories in the IAT. In this version of the IAT, participants were allowed to choose the traits that were self-descriptive or counterdescriptive with regard to self, a process that requires people to access their explicit views of self. Not surprisingly, individuals with more positive explicit self-attitudes appeared to have selected more subjectively desirable traits as self-descriptive (and undesirable traits as counterdescriptive) compared with individuals with more negative explicit self-attitudes. This asymmetry in the proportion of positive and negative self-descriptors appeared to have systematically facilitated and inhibited response latencies in the critical conditions. Individuals with primarily positive self-descriptors showed speeded facilitation in the congruent condition (when *describes me* was paired with *pleasant*) and greater inhibition in the incongruent condition (when *describes me* was paired with *unpleasant*), in part, because of the positive self stimuli chosen. The result was a more explicitly infused measure.

Patterns for explicit self-attitudes replicated previous research. As can be seen in Table 1, explicit self-attitudes strongly predicted positive and negative emotional experiences, consistent with known correlates of explicit self-esteem. Note that this profile is different from that found for implicit self-attitudes, which predicted negative emotional experiences only.

For sake of completeness, we tested for significant interactions between implicit and explicit self-attitudes in the prediction of affect. There was only one marginally significant interaction for disgust ($b = .175$, $\beta = .110$), $t(120) = 1.68$, $p < .10$, whereby individuals with negative implicit attitudes in combination with negative explicit self-attitudes reported the highest levels of disgust, more so than any other attitude combination. Before further speculating on this effect, additional replication was warranted.

Discussion

Although a measurement issue may have compromised our ability to test for unique effects, Study 1 does provide several important clues about the possible affective correlates of implicit self-attitudes. First, it was notable that implicit self-attitudes had a different affective profile than explicit self-attitudes. Implicit self-attitudes predicted primarily negative affective experiences and uniquely predicted the two strongest negative emotions on the affective circumplex: anger and disgust. By contrast, explicit self-attitudes predicted negative and positive affective experiences, consistent with previous research. Second, implicit self-attitudes predicted negative affect in an undifferentiated fashion, predicting all emotions that were negative in valence. These results tentatively suggest that implicit self-attitudes may be linked to core affect through general feelings of negativity.

Given the potential of Study 1, we conducted a second study to determine whether patterns would replicate using an improved IAT measure. In addition to modifying the IAT to minimize explicit influences, we also asked participants to report directly their experiences of positive and negative core affect rather than report their experience of individual emotions per se, as evidence from Study 1 confirmed that reports clustered into pleasant and unpleasant groupings. This change allowed us to sample a greater range of valenced experiences to test the breadth of implicit affect links. We also sought to determine whether the interaction pattern found for reports of disgust would be replicated.

Study 2

Method

Participants were 84 students (37 men) ranging in age from 18 to 31 years ($M = 20.12$ years, $SD = 2.20$). Data were collected as part of a larger study on individual differences in the experience of emotion for which participants were paid $50 for completing.[2]

At the first lab session, participants completed the RSES. Their RSES scores were calculated by summing the ratings across the 10 items (reversing negatively worded items), with higher numbers indicating higher explicit self-esteem. Again, reliability was high ($\alpha = .88$), and raw scores ranged from 24 to 70 ($M = 55.02$, $SD = 9.46$). The distribution was negatively skewed and normalized by a square root transform.

The administration of the RSES was followed by 5 min of filler questionnaires (unrelated to self-esteem) and then the IAT. The IAT differed in two ways from Study 1. First, we eliminated the self-selection of stimuli and instead used standard pronouns for the category of self (I, me, myself, self) and for other (other, them, they, themselves). These pronouns and category labels were used by Bosson et al. (2000), Farnham et al. (1999), and Greenwald and Farnham (2000). Second, we used slightly different evaluative category labels. Instead of pleasant and unpleasant evaluative categories (which use pleasant exemplars like peace, sunrise, and truth and unpleasant exemplars like death, killer, and vomit), we used success (accomplish, effective, proud, succeed, winner) and failure (ashamed, disappoint, fail, incapable, loser) categories. Our decision to use success and failure was driven by measurement goals to use stimuli more strongly linked to the self. At the study's inception, we reasoned that the typical self IAT (using standard pleasant and unpleasant stimuli) may be too generic to adequately tap into the implicit evaluative aspects of the self that are crucial for our hypothesis. So we chose to expressly target the self-worth and competency aspects of the self (Baumeister, 1998) using success and failure stimuli.

Although our IAT stimuli varied from standard protocol, we do not think this is problematic. Since we developed our study, published research has demonstrated that the measurement of implicit self-attitudes using the IAT format is flexible to some variations in category labels and exemplars. That is, self IATs typically correlate with one another when different category labels and word stimuli are used (e.g., using *Me–Not Me, Self–Other, Positive–Negative, Pleasant–Unpleasant*; Greenwald & Farnham, 2000). For example, Greenwald and Farnham (2000) ran an IAT that included words very much like ours, such as *proud, bright, smart, competent,* and *worth* as well as *stupid, failure, useless, guilty,* and *ashamed.* Scores on this IAT correlated strongly with scores on a more generic pleasant–unpleasant IAT using words like *peace, sunrise,* and *truth* and *death, killer,* and *vomit* ($r = .432$, $p < .01$). What appears most crucial is that participants categorize some type of self- and non-self-related stimuli (e.g., pronouns, idiographic information) along with some type of evaluative stimuli, whether general (e.g., health, kindness, death, killer) or specific (e.g., accomplish, effective, ashamed, disappoint).

After the IAT, each participant was issued a Handspring (Mountain View, CA) personal digital assistant (PDA) and received instructions for the experience-sampling portion of the study, which lasted an average of 17 days. Each PDA was installed with the Experience Sampling Program and programmed to audibly signal participants 10 times per day, randomly within equal intervals between 9 a.m. and 11 p.m. At each signal, participants were asked a series of 16 questions about their experiences (see the Appendix for a complete list of questions). Each question focused on some type of affect-related experience. First, participants were asked to report on their recent positive and negative events. Then they were asked about their current situation: whether it was unpleasant or pleasant and stressful or not, how much control they had over the situation, and how well they were coping. They were then asked a series of questions in random order about their positive affect, negative affect, momentary self-esteem, and evaluations about their day (e.g., whether or not they were having a good or bad day). Of 170 possible sampling moments (10 times/day for 17 days), the

actual number of moments responded to ranged from 38 to 120 ($M = 86$, $SD = 15$), reflecting an average response rate of 50%.

Analyses and Results

Individuals in our second sample also displayed positive implicit self-attitudes on average, consistent with results from Study 1 and previous research. Participants responded 369 ms faster when self was paired with success ($M = 943.33$ ms) than when self was paired with failure ($M = 1,312.53$ ms, $M_{diff} = -369.20$), $t(83) = -11.31$, $p < .01$. There was also considerable variability in these differences, ranging from $-1,098.31$ to 132.57 ($M = -369.20$, $SD = 299.16$). Before analysis, signs were changed so that higher difference scores indicated more positive implicit self-attitudes. Unlike Study 1, scores on this IAT and the RSES were not related ($r = .001$, ns).

Analyses were conducted the same way as in Study 1, and results are presented in Table 2. As can be seen, implicit attitudes toward the self predicted reports of negative affect as well as all other experiences with a negative affective quality. This profile of prediction is consistent with findings from Study 1 and notably different from the profile found for explicit self-attitudes (see column 2 of Table 2), which predicted both positive and negative affect-related experiences.

Crucially, the relations between implicit self-attitudes and experience remained significant when controlling for the influence of explicit self-attitudes (see Table 2). Regardless of their explicit views of self, individuals with more positive implicit self-attitudes reported fewer daily events and fewer negative events; they felt that their immediate situations were less stressful; they reported lower levels of negative affect; they were less likely to report having a bad day; and they were less likely to think that the rest of their day would be similarly bad. Individuals with more negative implicit self-attitudes showed the opposite pattern. Again, as with Study 1, no links were found between implicit self-attitudes and positive affect-related experiences. Results suggest that implicit self-attitudes have incremental validity in the prediction of negative affect-related experiences.

Again, as with Study 1, patterns for explicit self-attitudes replicated previous research. Table 2 also shows that explicit self-attitudes strongly predicted positive and negative affective experiences, consistent with known correlates of explicit self-esteem. Like Study 1, this profile of prediction is different from that found for implicit self-attitudes, which predicted negative affective experiences only.

There were also several significant interactions, which replicated the almost significant interaction found for reports of disgust in Study 1. As can be seen in Table 2, implicit self-attitudes interacted with explicit self-attitudes in the prediction of negative affect, current pessimism, and future pessimism. An example of this interaction for negative affect is shown in Figure 1. Individuals with negative implicit attitudes in combination with negative explicit attitudes reported the highest levels of negative affect relative to all other attitude combinations. Simple slopes analyses also revealed differences in the implicit–affect link as a function of explicit attitudes. As can be seen in the bottom slope, the implicit–affect link was weak for individuals with very positive explicit

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[2] These data are from Tamlin Conner's doctoral dissertation.

Table 2
Patterns of Prediction for Affective Experiences Sampled in Study 2

| | Implicit | | Explicit[a] | | | Implicit | Explicit[b] | | |
Affective experience	Overall	Unique	Overall	Unique	Interaction	Unique	Overall	Unique	Interaction
Recent events									
Total	−.232*	−.232*	.137	.138		−.236*	.270**	.270**	
Positive	−.154	−.155	.274**	.274**		−.159	.297**	.299**	
Negative	−.266**	−.266*	−.009	−.009		−.267*	.013	.017	
Current situation									
Valence	.046	.046	.485**	.485**		.042	.270**	.270**	
Stress	−.276**	−.276**	−.273**	−.273**		−.275**	−.060	−.056	
Control	.059	.058	.442**	.442**		.053	.364**	.363**	
Coping	−.134	−.135	.406**	.406**		−.138	.244*	.246*	
Affect									
Positive affect	.003	.003	.430**	.430**		−.001	.306**	.306**	
Negative affect	−.286**	−.315**	−.290**	−.332**	.228*	−.299**	−.170	−.137	.181*
Self-esteem									
Good	.001	.001	.520**	.520**		−.004	.341**	.341**	
Worthwhile	.001	.001	.525**	.525**		−.003	.316**	.316**	
Competent	−.017	−.017	.514**	.514**		−.022	.349**	.349**	
Evaluations of day									
Current optimism	.040	.040	.411**	.411**		.037	.248*	.247*	
Future optimism	.048	.048	.365**	.365**		.045	.198†	.197†	
Current pessimism	−.299**	−.263**	−.299**	−.296**	.254*	−.260**	−.221*	−.217*	
Future pessimism	−.279**	−.209*	−.279**	−.235**	.201*	−.206*	−.211*	−.208*	

Note. The first five data columns report the primary analyses for the relations among implicit self-attitudes (Implicit Association Test; IAT), explicit self-attitudes (Rosenberg Self-Esteem Scale; Rosenberg, 1989), and affective experience. The remaining data columns report the follow-up analyses for the relations between implicit self-attitudes (IAT), explicit self-competency (Self-Attributes Questionnaire; Pelham & Swann, 1989), and affective experience. Overall coefficients are similar to zero-order correlations and indicate the total contributions of implicit or explicit predictors to affective experience. Unique coefficients are the unique contributions of implicit and explicit predictors to affective experience when controlling for the other. Interaction coefficients reflect the weight of the cross-product interaction terms. For any significant interactions, the unique coefficients were computed with the interaction term in the equation.
[a] Explicit self-attitudes measured by the Rosenberg Self-Esteem Scale. [b] Explicit self-competency measured by the Self-Attributes Questionnaire.
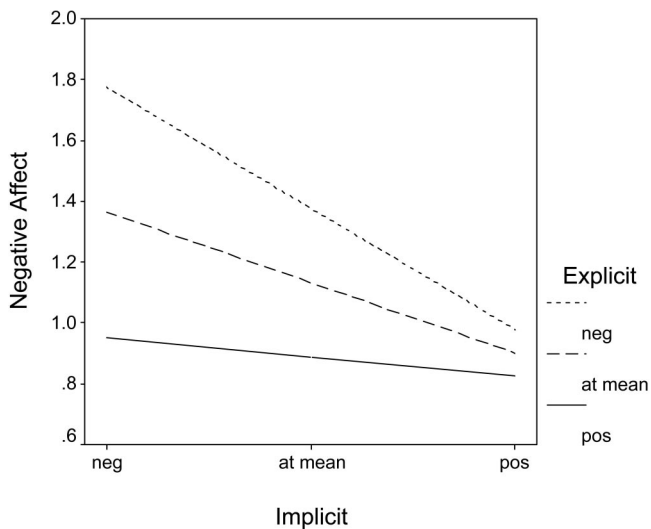† $p < .10$. * $p < .05$. ** $p < .01$.

Figure 1. Implicit and explicit self-attitudes interacted to predict several affective experiences in Study 2. This figure illustrates the typical interaction pattern. A plot of the simple slopes shows the relation between implicit self-attitudes and negative affect for individuals with relatively negative (neg; −1 SD), normative (at mean), and positive (pos; +1 SD) explicit self-attitudes.

self-attitudes (slope + 1 SD, $b = -.149$), $t(80) = -.63$, *ns*. In other words, individuals with very positive explicit self-attitudes (i.e., who scored above the mean on the RSES of a normatively positive sample) reported low levels of negative affect regardless of their implicit attitude. However, the link was evident for individuals at the mean (middle slope, $b = -.536$), $t(80) = -4.119$, $p < .01$, and below the mean in explicit attitudes (top slope, $b = -.923$), $t(80) = -4.111$, $p < .01$. What is also noticeable from this graph is that individuals with very positive implicit self-attitudes (i.e., who scored above the mean on the IAT of a normatively positive sample) reported low levels of negative affect, regardless of their explicit attitude (see right-side data points). From these patterns combined, it appears that having at least one very positive self-attitude, explicit or implicit, may buffer individuals from negative affective experiences. We speculate further in the following discussion.

Finally, our use of a success–failure categorization in the IAT makes another interpretation possible. Although slight variations in IAT stimuli probably tap the same underlying construct, it is still possible that our IAT may have tapped implicit evaluation that was specific to self-competency rather than a general evaluative quality. If so, this suggests that a more appropriate control would be an explicit measure of self-competency. To address this issue, we reran the analyses substituting for the RSES scores an explicit measure of self-competency, scores on the Self-Attributes Questionnaire (SAQ; Pelham & Swann, 1989), which was included

before the RSES in the same battery of questionnaires administered in the first laboratory session.[3] The results of these follow-up analyses are presented in Table 2. As can be seen, the unique relations between implicit self-attitudes and affect-related experiences remained statistically significant when controlling for the influence of explicit self-competency, suggesting that the unique patterns are robust. Indeed, the correlation between the IAT and the explicit self-competency measure was nearly zero ($r = .008$, ns). It should also be noted that the explicit self-competency measure itself predicted daily affect in a way similar to the explicit self-attitude measure (RSES; see Table 2), and that the interaction patterns were also similar, although not as strong as those found previously (see data column 9).

General Discussion

Our evaluations of ourselves, even those that are implicit, predict how we spontaneously feel in everyday life. Across two studies, implicit self-attitudes uniquely predicted negative momentary affective experiences as measured outside of the laboratory over periods of 1 month (Study 1) and 2 weeks (Study 2). Implicit self-attitudes accounted for variance in affective experience over and above the variance accounted for by explicit attitudes alone, suggesting that implicit self-attitudes have incremental validity in the prediction of negative affect.

These studies are important because they add to the growing body of research showing that implicit self-attitudes are linked to more spontaneous, less controlled outcomes. They are unique in that they establish a link between implicit self-attitudes and the phenomenological experience of affect, as measured by frequent repeated probes in daily life. Thus, not only do implicit self-attitudes predict spontaneous behaviors (e.g., Asendorpf et al., 2002; Spalding & Hardin, 1999) and judgments (i.e., self-evaluations made under cognitive constraints; Koole et al., 2001), but they also predict feelings.

The finding that implicit self-attitudes predicted negative affect and not positive affect was replicated across two studies. Note how this asymmetry is consistent with previous research manipulating implicit self-attitudes. Patterns from Dijksterhuis (2004) revealed that boosting implicit self-attitudes buffered individuals from feeling bad after negative feedback but did little to enhance their feeling good after positive feedback. Likewise, our results revealed that individuals with positive implicit self-attitudes were buffered from feeling negative affect but were no more likely to report higher positive affect in daily life as a function of their implicit attitudes. Taken together, these findings suggest that implicit self-attitudes have stronger ties to negative affective processing.

These patterns tentatively suggest a role for implicit self-attitudes in the appraisal of self-related threats. We know from previous research that the self-system is geared toward the monitoring of interpersonal threats, failures, and rejections more than toward the monitoring of nonthreats or successes (Leary, Tambor, Terdal, & Downs, 1995). Appraising a situation as threatening to the self is known to give rise to negative affective states, which help us to deal with potentially detrimental situations (Lazarus & Folkman, 1984). It may be that implicit self-attitudes serve as one important source of data for these self-related appraisals. Individuals with more negative implicit self-attitudes may appraise many more situations to be threatening, leading to more negatively toned emotional experience, whereas individuals with more positive implicit self-attitudes could be appraising fewer situations as threatening, leading to less negative emotional experience.

This interpretation could also account for why implicit self-attitudes did not predict corresponding shifts in positive affect. There is considerable debate about whether positive and negative affect are functionally independent (Cacioppo & Gardner, 1999) or whether they should be considered as opposite ends of a bipolar continuum (Barrett & Russell, 1998). Without seeking to reconcile these positions, we should note that positive and negative affect have been predicted separately in past research. For example, an asymmetry is often observed with personality traits such as extraversion, which predicts primarily positive affect (e.g., Lucas, Diener, Grob, Suh, & Shao, 2000; Watson & Clark, 1997), and neuroticism, which predicts primarily negative affect (e.g., Watson & Clark, 1984). These relations are thought to reflect differential sensitivities to reward versus threat cues, respectively (Eysenck, 1981; Gray, 1970). This research suggests that implicit self-attitudes may play less of a role in the processing of self-related rewards (linked to positive affect) and more of a role in the processing of self-related threats (linked to negative affect).[4]

Of course, these discussions favor a particular causal direction, which our correlational design cannot confirm. Nevertheless, we are comfortable speculating on these appraisal mechanisms because previous research has already established a causal link between implicit self-attitudes and emotional reactions (Dijksterhuis, 2004). We also have some evidence consistent with a causal relation. In Study 1, the IAT was administered 1 week into the 4-week sampling period. Follow-up tests revealed that the IAT was much more likely to predict subsequent core affect (averaged

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[3] In the SAQ (Pelham & Swann, 1989), participants rated their explicit self-competency in 10 ability domains relative to other college students their own age on a scale ranging from 1 (*in the bottom 5%*) to 10 (*in the top 5%*). We created an explicit self-competency index by averaging their responses to the four broadest domains (intellectual–academic ability, social skills–social competence, leadership ability, and common sense). Higher numbers indicated greater explicit self-competency ($\alpha = .70$). This four-item subscale had internal reliability ($\alpha = .70$) comparable to the overall scale with all items included ($\alpha = .67$ in this sample and $\alpha = .76$ reported by Pelham & Swann, 1989). We excluded specific abilities (artistic or musical ability; athletic ability; physical attractiveness; sense of humor; luck; and discipline), recognizing that people who feel generally competent may not show competency or higher ratings in these specific domains. Control analyses were the same regardless of whether we used the four or 10 item measure.

[4] Readers may be interested in knowing whether implicit self-attitudes were systematically related to neuroticism, given that neuroticism is a strong predictor of negative affect. In Study 2, we included two measures of neuroticism in the battery of questionnaires. Scores on the success–failure IAT were unrelated to the Big Five Inventory neuroticism index (John, 1990; $r = -.170$, ns) but were related to the Eysenck Personality Inventory neuroticism index (Eysenck & Eysenck, 1975; $r = -.225$, $p < .05$), with positive implicit self-attitudes corresponding with lower neuroticism. Accordingly, we reran all hierarchical linear analyses using these neuroticism measures as a control. Implicit self-attitudes continued to strongly and uniquely predict variance in negative affect over and above individual differences in neuroticism regardless of whether neuroticism was measured with the Big Five or Eysenck indexes. These analyses give us greater confidence that implicit self-attitudes are important predictors of affective experiences, with predictive validity beyond what standard personality questionnaires afford.

across Week 2) than to be predicted by previous core affect (averaged across Week 1), suggesting that implicit self-attitudes are driving affective states and not vice versa. However, these analyses do not address the third variable issue: that some other factor (*Z*) might be driving implicit self-attitudes (*X*) and affective experiences (*Y*) separately, resulting in their apparent causal path. As noted earlier, implicit self-attitudes are thought to stem from repeated and valenced self-relevant events in development. It may be that individuals with higher base rates of objectively negative life events come to develop negative implicit self-attitudes, and they also experience higher levels of negative affect because of these events. In this way, implicit self-attitudes and negative affect could be related without necessitating a direct path between the two. Although this alternative is certainly plausible, we are less concerned with it given previous research showing that systematically varying implicit self-attitudes (*X*) results in changes to emotional experience (*Y*) in the face of failure feedback (Dijksterhuis, 2004). However, future research will certainly require additional causal tests.

Interactions With Explicit Self-Attitudes

There were also several significant interactions between implicit and explicit self-attitudes in the prediction of affect. Most striking was how individuals with dual negative attitudes (negative implicit and negative explicit) were disproportionately the worst off for certain experiences. They reported more intense levels of disgust in Study 1 as well as higher levels of negative affect and pessimistic evaluations of the day in Study 2. This vulnerability has been found previously to some extent. For example, individuals with this profile have reported being the least optimistic about their futures relative to their peers and the least likely to endorse a flattering description of themselves (e.g., Bosson, Brown, Zeigler-Hill, & Swann, 2003). Individuals with this profile have also been shown to be disproportionately vulnerable to illness in the face of unexpectedly positive life events (Shimizu & Pelham, 2004).

By contrast, individuals with at least one very positive self-attitude (implicit or explicit) fared much better and in similar fashion to individuals with dual positive attitudes (positive implicit and positive explicit), at least in reports of negative affect and daily pessimistic evaluations. In fact, for these states, having dual positive attitudes conferred only minimal additional protection in terms of emotional well-being. We can think of two alternate interpretations of this pattern. One possibility is that patterns could simply reflect floor effects in the reporting of these negative states. Average reports for disgust, negative affect, current pessimism, and future pessimism were quite low in our nonclinical student samples (*M*s = 1.07–1.19 on a 0–6 scale). Thus, individuals with dual positive attitudes may not have differed from those with single positive attitudes because negativity was already at floor. Another possibility is that patterns may reflect some type of buffering effect, whereby having at least one very positive self-evaluation (implicit or explicit) protects the individual from experiencing relatively higher levels of negative affect. Having a very positive implicit attitude could result in fewer threat appraisals, producing little change in negative affect from baseline regardless of how that person feels about him or herself explicitly. This idea of implicit self-attitudes acting as a buffer for threat has been proposed elsewhere (Bosson et al., 2003). However, what is unique is the possibility of positive explicit self-attitudes also

acting as a buffer. For example, having a very positive explicit attitude could temper these immediate threat reactions or stimulate reappraisal processes, leading to less negative experiences. A buffering interpretation could also explain why individuals with a vulnerable profile were the worst off. They lacked any positivity in their self-evaluations and thus may have appraised many more situations as threatening to the self without any explicit beliefs to temper these reactions.

Our interaction patterns also differed somewhat from previous research on fragile or defensive self-esteem (i.e., individuals with positive explicit–negative implicit self-esteem). Individuals with this profile are known to be more easily threatened and motivated to restore positive self-regard (Bosson et al., 2003; Jordan et al., 2003; Kernis, 2003). They score higher on measures of narcissism (Jordan et al., 2003), show greater defensive behavior (Jordan et al., 2003), and are more likely to hold overly flattering and unrealistically optimistic views about themselves and their future (Bosson et al., 2003) compared with individuals with a more secure profile (positive explicit–positive implicit). Given this body of research, one might expect parallel results for our study, namely that individuals with a fragile profile would differ in their emotional lives from those with a more secure profile. However, we found no such evidence in the interaction patterns (see Figure 1). The only notable difference between these profiles occurred for reports of stress. Individuals with a fragile profile (positive explicit–negative implicit) reported experiencing more stress compared with those with a secure profile (positive–positive), but their stress was comparable to those with a more humble profile (negative–positive), and it was far below the stress reported by the truly vulnerable (negative–negative). Taken together, these patterns suggested nothing special about the fragile combination in the prediction of affect.

We suspect that the differences between our findings and those found previously may reflect the nature of our outcome variable: the conscious experience of affect. If defenses are truly successful, they should affect what people consciously report feeling, even if reports are made in experience sampling (cf. Barrett & Barrett, 2001; Conner et al., 2003; Shiffman, 2000). Whereas defense may be apparent when using standard measures of self-enhancement (e.g., Bosson et al., 2003; Jordan et al., 2003), it should be less apparent when using self-report measures of emotional experience. Clearly, more research is needed to understand these complexities.

Implications

These studies have several implications. First, they suggest that implicit self-attitudes are an important factor in predicting the multifaceted experience of affect, particularly affect that is negatively toned. When seeking to understand who will feel worse in a given situation, researchers should consider implicit self-attitudes as an additional predictive factor.

Second, if future research continues to support a causal link, results will have important implications for emotional well-being. Namely, they will suggest that the associative by-products of early learning environments (implicit self-attitudes) may continue to shape our emotional reactions into adulthood, despite what people may have come to explicitly endorse about their own self-worth. Implicit self-attitudes are known to be slow to change (Hetts, Sakuma, & Pelham, 1999), and because they are considered similar to other forms of associative learning (Karpinski & Hilton,

2001; Olson & Fazio, 2001), they should also be difficult to extinguish (Bouton, 1994) and renewable under conditions of stress (Jacobs & Nadel, 1985). If individuals with negative self-attitudes stemming from development (DeHart, Pelham, & Tennen, in press) undergo therapy or move to a new psychological environment, they may continue to perceive more threat and feel worse compared with someone without such underlying vulnerability. Thus, our results support the idea that to change one's emotional life, one must address implicit learning (Wilson, 2002). Results speak to the need for continued research on the changeability of implicit attitudes toward the self (e.g., through reconditioning; see Baccus, Baldwin, & Packer, 2004, and Dijksterhuis, 2004, for promising methods), although preferably beyond temporary laboratory manipulations.

Results also have implications for understanding the interplay between implicit processes and conscious awareness. From a reading of the implicit attitude literature, it is easy to come away with the idea that implicit attitudes predict primarily nonverbal types of behaviors and other outcomes of which people are not typically aware. However, the present data, combined with those of Dijksterhuis (2004), suggest that implicit self-attitudes can be linked to feelings of which we are aware and can convey through verbal self-report. In this way, momentary affective experience may be an important intersection between our implicit and explicit selves. Through our immediate affective reactions, we can observe the by-products of our implicit processes and possibly gain insight into our own implicit personality tendencies (Wilson, 2002). This intersection may explain why certain individuals who have a propensity to pay greater attention to their gut affective experiences have a greater correspondence between their implicit and explicit self-knowledge (i.e., women [Pelham, Koole, Hardin, Hetts, Seah, & DeHart, 2005] and mindful individuals [K. W. Brown & Ryan, 2003, Study 3]). Paying attention to momentary affective experiences may allow individuals to develop explicit knowledge that is much more aligned with their implicit evaluations.

The present research also suggests several important boundary conditions on the implicit–affect link. First, implicit self-attitudes should only predict affective experiences when affect is reported in a spontaneous fashion. The longer the time delay between the initial emotional experience and the reporting of that experience, the more those reports will lose the original episodic details and be filled in with generalized semantic knowledge (for a review see Robinson & Clore, 2002). Our use of computerized experience sampling allowed no such time delay because people were asked how they felt at that moment. Difference in reporting times may also explain why implicit self-attitudes have failed to predict positive and negative affect when affect is measured using global self-reports (e.g., how a person feels in general; Schimmack & Diener, 2003). Second, we caution against relying too heavily on one-time emotion ratings in follow-up tests of implicit–affect links. It is well known that single self-reports can be influenced by a multitude of factors (Schwarz, 1999), and so one-time emotion reports may not be reliable enough to detect the influence of implicit attitudes with sufficient power, even if affect is reported spontaneously. This may be an even greater issue if implicit attitudes are simply measured (see Egloff & Schmukle, 2002) rather than manipulated (see Dijksterhuis, 2004). Our intensive repeated measures design allowed for the aggregation of emotion reports, thereby reducing the influence of extraneous factors (Epstein, 1983).

Finally, our research has implications for other types of attitudes, not just about the self. Although we focused on implicit self-attitudes, we would expect implicit attitudes for other types of objects (i.e., about, e.g., significant others, gays, African Americans, women) to systematically predict spontaneous affective experiences in the presence of that attitude object. In romantic relationships, for example, people's implicit attitudes toward their partners should predict a significant amount of variance in core affective reactions to partners over and above that predicted by explicit attitudes alone, especially under times of duress. Understanding the relative contributions of implicit and explicit attitudes for the self and for others might allow psychologists to better predict people's emotional reactions. The methods used here—implicit measures in combination with experience sampling—are ideally suited for such research.

Limitations

There were several other limitations beyond the correlational nature of our design. First, the IATs that we used differed slightly from those used in other published research. These differences leave open the possibility that our results, especially the strong patterns observed in Study 2, were unique to our measure (i.e., the success–failure IAT). Again, we doubt this interpretation given research showing that variants of self-IATs typically correlate, but it is still possible. This measurement issue does raise a broader question of how best to measure implicit self-attitudes, which, in turn, raises the issue of how implicit self-attitudes are organized and structured in the mind. For example, it is possible that implicit self-attitudes may be hierarchically arranged much like other concepts (Rosch, 1978). We may have a broad valenced self-evaluation (tapped by generic good–bad IATs), but connected to this may be other evaluations that are more specific. Evaluations could derive from repeatedly succeeding or failing at important goals, being accepted or rejected by important others as sociometer theory would suggest (Leary et al., 1995), or any other frequent experiences that affect our relative standing as social beings. Heterogeneity in experience raises questions about what types of experiences (successes–failures, or feelings of inclusion–exclusion) contribute most to our broad implicit evaluations.

Second, we relied exclusively on the IAT format to measure implicit self-attitudes. Again, there are different opinions about the best way to measure implicit self-attitudes, whether using a standard IAT (Greenwald & Farnham, 2000), a modified IAT without an "other" reference group (e.g., Affective Simon Task, De Houwer, 2003a; Single Category Association Test, Karpinski & Steinman, in press; Go/No-Go Association Task, Nosek & Banaji, 2001), evaluative priming paradigms (e.g., Spalding & Hardin, 1999), or noncomputerized measures such as preferences for the letters in one's initials (the initials preference test, Koole & Pelham, 2003; Nuttin, 1985). We chose the standard IAT format because it was among the most well-used and field-tested measure when we designed our studies (used by Asendorpf et al., 2002; Greenwald & Farnham, 2000; Jordan et al., 2003), on par with the initials preference test (used by Bosson et al., 2003; Koole et al., 2001; Shimizu & Pelham, 2004). The problem is that implicit attitude measures rarely correlate (Bosson et al., 2000), which necessarily limits the generalizability of results across studies using these measures. Again, resolution of this issue will require a better understanding of how associative knowledge about the self

is represented in mind and how these tasks tap into that knowledge (for related discussions see Banaji, 2001; Brendl, Markman, & Messner, 2001; De Houwer, 2001, 2003b; Olson & Fazio, 2004). At a minimum, additional research is needed to test whether similar implicit–affect links would be found with alternate measures of self-evaluation.

Finally, we were surprised that implicit self-attitudes did not predict people's momentary reports of self-esteem in Study 2. One might expect that implicit self-attitudes would predict people's immediate judgments of how good, worthwhile, and competent they were feeling. Instead, only explicit attitudes predicted these judgments. One possible explanation is that implicit self-attitudes failed to predict these experiences because the items were exclusively of a positive nature. It is important for future research to include items that highlighted negative self-evaluations to determine whether implicit self-attitudes might then be a significant predictor. Alternatively, a core affect perspective might also explain this finding. From a core affect perspective, people with more negative implicit self-attitudes will be more likely to feel bad without a clear understanding of why they feel bad or just how precisely they feel bad. If people feel bad, it is relatively easy for them to infer that they are in a bad mood or that they are having a bad day, but they may not necessarily feel that they themselves are bad, worthless, or incompetent. In our North American culture, people are reluctant to attribute negative experiences to the self (Taylor & Brown, 1988) because saying that one is bad or worthless runs counter to independent cultural norms of self-enhancement (Markus & Kitayama, 1991). Because of this norm, any attribution of negative core affect to the self would probably depend on additional mitigating factors, including heightened salience of the self or idiographic tendencies to invoke the self as a causal factor (i.e., depression).

Future Directions

There are several avenues for future research. One direction involves examining the psychological and contextual factors that moderate the link between implicit attitudes and affective experience. In general, anything that affects a person's motivation or capacity to process information systematically should affect the extent to which implicit attitudes predict core affective feeling states. For example, individuals who are chronically cognitively taxed (e.g., experiencing frequent and repeated stress) or who have lower working memory capacity (Barrett, Tugade, & Engle, 2004) might have core affective experiences that are much more predicted by their implicit attitudes. Likewise, people in positions of greater interpersonal power might also respond in more implicitly infused ways because increased power is associated with more automatic processing in interpersonal situations (Keltner, Gruenfeld, & Anderson, 2003).

Yet stronger implicit–affect links may not solely indicate impairment (e.g., reduced capacity; higher stress). Other factors could also strengthen the link, including differences in mindfulness (K. W. Brown & Ryan, 2003) and self-awareness (Duval & Wicklund, 1972). For example, individuals who are more mindful or under conditions of heightened self-awareness may be more attuned to important affective signals deriving from appraisal processes. As a result, they may pick up on subtle shifts in core affect when assessing their emotion state, which should produce a stronger correspondence between implicit self-attitudes and self-

reported affect. Addressing these issues should promote better understanding of the process by which people assess how they are feeling and the degree to which people vary in their use of experiential information to inform their self-report (for related discussions, see Robinson & Clore, 2002).

Future research should also address the mechanisms through which implicit self-attitudes influence affective states. We have proposed that implicit self-attitudes influence affect by means of the appraisal of self-related threats. If so, then manipulating implicit self-attitudes should have systematic effects on threat-related processing as measured by standard paradigms (e.g., dot probe task; MacLeod, Mathews, & Tata, 1986; emotional Stroop test, Williams, Mathews, & MacLeod, 1996). Furthermore, it would be interesting to know whether boosting implicit self-attitudes would mollify the detection of all threats or only threats related to the self.

A third direction of research is the most challenging. It concerns understanding the conditions under which implicit self-attitudes (and other implicit attitudes for that matter) create changes in phenomenological affective experience (e.g., feeling bad or anxious) versus behavioral responses only (e.g., observable nonverbal indicators of feeling bad; withdrawal). Research is replete with examples of how associative knowledge can be activated to affect the state of the organism without corresponding changes to phenomenological experience (i.e., by means of behavioral changes only; Bargh, Chen, & Burrows, 1996; Spalding & Hardin, 1999). This raises the issue of when do implicit self-attitudes affect feelings (phenomenological experience of feeling bad), behavior (spontaneous nonverbal behaviors with no awareness of feeling bad), or both (nonverbal behaviors accompanied by the phenomenological experience of feeling bad). These exciting questions await future empirical tests.

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(*Appendix follows*)

Appendix

Affective Experiences Sampled in Study 2

Affective experience	Item
Recent events	
Total	How many total events occurred since the last signal? (0–6+)
Positive	How many of these were positive? (0–6+)
Negative	How many of these were negative? (0–6+)
Current situation	
Valence	How unpleasant (0) or pleasant (6) would you rate the current situation?
Stress	How stressful is the current situation? (0 = *not at all,* 6 = *very*)
Control	How in control do you feel of the situation? (0 = *not at all,* 6 = *very*)
Coping	Do you have the resources to cope with the current situation? (0 = *not at all,* 6 = *very*)
Affect	
Positive affect	To what extent are you in a positive mood? (0 = *neutral,* 6 = *very*)
Negative affect	To what extent are you in a negative mood? (0 = *neutral,* 6 = *very*)
Self-esteem	
Good	How good do you feel about yourself right now? (1 = *very bad,* 7 = *very good*)
Worthwhile	How worthwhile do you feel right now? (1 = *worthless,* 7 = *worthwhile*)
Competent	How competent do you feel right now? (1 = *incompetent,* 7 = *very competent*)
Evaluations of day	
Current optimism	Are you are having a good day? (0 = *neutral,* 6 = *very good day*)
Future optimism	How good do you feel about the rest of your day? (0 = *neutral,* 6 = *It will be a great day*)
Current pessimism	Are you having a bad day? (0 = *neutral,* 6 = *very bad day*)
Future pessimism	How bad do you feel about the rest of your day? (0 = *neutral,* 6 = *It will be a terrible day*)

Note. The first seven items were presented in a fixed order at each signal. The remaining items were presented in a random order at every signal.