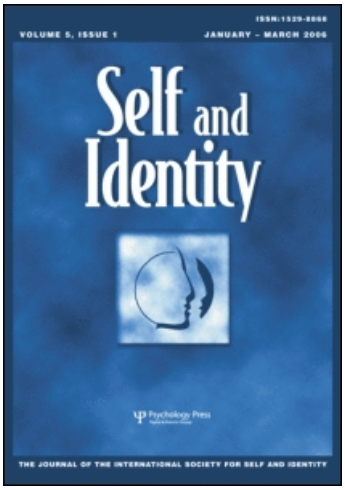

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Belief and Feeling in Self-reports of Emotion: Evidence for Semantic Infusion Based on Self-esteem

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Belief and Feeling in Self-reports of Emotion: Evidence for Semantic Infusion Based on Self-esteem

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When people make verbal reports of their emotional experience, they can rely on multiple sources of knowledge, including generalized beliefs about the self. To the extent that generalized beliefs about the self are used, we term the resultant consequence a semantic infusion effect. Across three studies, we demonstrate the predictable consequences of making emotion judgments more quickly versus more slowly, based on a recent model of the emotional self-report process (Robinson & Clore, 2002a). As predicted, when participants (Ns = 69, 37, and 44) made emotion judgments involving long time frames (e.g., last couple of months; Studies 1–3), faster judgments were associated with emotion ratings that were more consistent with global self-esteem. By contrast, when making emotion judgments involving a short time frame (right now; Study 3), the same pattern was not found. Results are interpreted in terms of semantic infusion effects, although other theoretical frameworks are also discussed. The results have implications for understanding global self-esteem and emotion self-reports.

Keywords: Emotion; Judgment; Reaction time; Self-esteem; Self-report.

Whether we believe that self-reports of emotion are typically valid (Diener, Sandvik, Pavot, & Gallagher, 1991), often invalid (Shedler, Mayman, & Manis, 1993), or sometimes valid (Kahneman, 1999), most investigators would probably agree on the following three points. First, self-reports of emotion likely draw upon a number of processes related to information retrieval (Diener, 1994). Second, some of these processes may add to the validity of self-reports, whereas others may detract from the validity of self-reports (Schwarz & Strack, 1991). Third, a nuanced understanding of how these processes produce verbal reports is likely to yield both theoretical and applied dividends (Stone et al., 2000). The goal of the present studies was to better understand the emotional self-report process and it follows from our prior work on a two-process model of emotional self-report.

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A Two-process Model of Emotional Self-report

The two-process model of emotional self-report was stimulated by two reviews of the literature on sex and emotion (LaFrance & Banaji, 1992; Shields, 1991). Both reviews concluded that sex differences in emotion appeared to be more pronounced in studies assessing trait, retrospective, or hypothetical emotional experiences relative to studies assessing current momentary emotional experiences. The explanation for this divergence appears to be that women believe that they are more emotional than men and that such beliefs are differentially important when individuals are reporting on feelings that they are not currently having (Shields, 1991). These conclusions were systematically supported in two subsequent experimental reports comparing sex differences in momentary and retrospective reporting conditions (Barrett, Robin, Pietromonaco, & Eyssell, 1998; Robinson, Johnson, & Shields, 1998).

These data seem important not just in relation to sex differences, but also more generally in understanding the different sources of self-knowledge that may contribute to online reports of emotion versus those concerning trait, retrospective, or hypothetical emotional experiences. Therefore, Robinson and Clore (2002a) conducted a thorough review of multiple literatures showing similar dissociations, such as those related to culture and emotion, personality and emotion, and retrospective biases in emotion reporting more generally considered. Briefly, multiple literatures highlight the similar principle that one's beliefs concerning emotion seem to differentially contribute to trait, retrospective, and hypothetical reports of emotion relative to online reports of emotion (Robinson & Clore, 2002a).

Two subsequent developments are particularly important here. First, Robinson and Clore (2002a) used their literature review to propose a two-process model, which posits that there are two major retrieval processes that contribute to self-reports of emotion. The first retrieval process relates to *episodic* emotion knowledge, which is emotion knowledge specific to time and place. The second process relates to *semantic* emotion knowledge, which is emotion knowledge that is general in nature and not at all dependent on time or place (see Tulving, 1984, 1993, for cognitive reviews of the episodic/semantic distinction). Robinson and Clore (2002a) further proposed that the interplay of these two different retrieval processes seems to provide a principled basis for understanding dissociations of the sort highlighted in the review. Specifically, in all cases in which episodic emotion knowledge is difficult or impossible to retrieve (as would be true of generalized, retrospective, and hypothetical reports of emotion), individuals appear to retrieve semantic emotion knowledge instead. This, in turn, explains why non-online reports of emotion (e.g., those that are trait-related or retrospective) tend to be much more belief-consistent than online reports of emotion are (Robinson & Clore, 2002a).

Although ratings can provide important hints concerning retrieved sources of information, it seems best to assess retrieval processes in a more objective cognitive manner. This led Robinson and Clore (2002b) to consider whether emotion judgment time might be a sensitive clue to the retrieval processes involved in a given emotion judgment. Of most importance here, it was found that for time frames shorter than the *last few weeks*, longer time frames were associated with slower judgments. This suggested a retrieve-and-aggregate episodic retrieval strategy for such shorter time frames. On the other hand, for time frames longer than the *last few weeks*, increased time frame width was associated with somewhat faster emotion judgments. The latter pattern is not consistent with an episodic

retrieval strategy, but rather is consistent with a semantic one. For example, emotion judgment latencies were somewhat equally fast for the time frame *last few years* and *last few months*, despite the much greater width of the former time frame relative to the latter. Additional studies and sources of data confirmed other predictions of the two-process model, and these extensive data led us to suggest that people typically retrieve fundamentally different sources of information in relation to short (episodic) versus long (semantic) time frame emotion reports (Robinson & Clore, 2002b).

The two-process model, and evidence for it, has been extended in recent years (e.g., Ready, Robinson, & Weinberger, 2006; Robinson & Clore, 2007; Robinson & Kirkeby, 2005; Robinson & Oishi, 2006; Robinson & von Hippel, 2006; Tamir & Robinson, 2004). A complete account of these findings is not useful here. Suffice it to say that these recent investigations have used the two-process model to understand individual differences in the organization of semantic emotion knowledge, for example in relation to differences between younger and older participants (Ready et al., 2006) or between those lower and higher in life satisfaction (Robinson & von Hippel, 2006). Two foci of the present studies, however, are entirely unique to the present work. First, no prior studies in this line of research have focused on individual differences in self-esteem, the focus of the current work. Second, no prior studies in this line of research have focused on the assessment-related predictions that we make here. We elaborate on these novel research goals below.

Self-esteem and Self-evaluations

Individual differences in self-esteem have been shown to play a broad role in many social phenomena (see Baumeister, Tice, & Hutton, 1989; Brown, 1998; Campbell & Lavallee, 1993, for reviews). In understanding such relations, researchers have focused on motivational and cognitive processes. Motivationally, it has been suggested that self-enhancement motives are primary to individuals high in self-esteem, whereas self-protection or self-verification motives are more characteristic of individuals low in self-esteem (e.g., Swann, 1992; Tice, 1991). Motivation, however, has long been assumed to operate in terms of cognitive mechanisms (e.g., Bruner, 1957; Higgins & Sorrentino, 1990; McClelland, 1987) and a cognitive analysis of individual differences in self-esteem should therefore be useful.

In terms of the cognitive processing correlates of self-esteem, there are extensive data to suggest that individuals low in self-esteem are less certain concerning their (semantic) self-concepts (e.g., Baumgardner, 1990; Campbell, 1990). One provocative source of data for such conclusions relates to the effects of social feedback. Individuals high in self-esteem are often relatively insensitive to negative social feedback, presumably because such feedback does not match the polarized positive self-concepts of such individuals (Shrauger & Sorman, 1977; Swann, 1992). On the other hand, individuals low in self-esteem are often affected by both positive and negative social feedback, consistent with the mixed self-evaluations of such individuals (Campbell & Fairey, 1985; Zuckerman, 1979).

Many sources of data, then, converge on the idea that individuals high in self-esteem possess beliefs concerning the self that are polarized in a positive direction. On the other hand, individuals low in self-esteem possess beliefs concerning the self that reflect a mix of positive and negative attributes and experiences (Baumeister et al., 1989; Pelham & Swann, 1989). From the present perspective, such divergent self-beliefs provide an important opportunity to both understand the cognitive basis

of self-esteem and to extend the two-process model of emotional self-report (Robinson & Clore, 2002a) in a novel manner.

Emotion Judgment Latencies and the Semantic Infusion Effect

We first point out that the goal of the present studies was not to "prove" the two-process model of emotional self-report, as presented by Robinson and Clore (2002a). Prior studies of ours are more relevant to this goal (see review above). Rather, the goal of the present studies was to use the two-process model to understand individual differences in self-esteem and to reinforce, in a novel way, the usefulness of judgment latencies as clues to the relevant emotion judgment process. Although our predictions are based on the two-process model, there are other theoretical perspectives that have some relevance to our predictions. These perspectives will be omitted here for the sake of parsimony and considered more fully in the general discussion.

We build on the results of Robinson and Clore (2002b), who found evidence for the idea that it is easier to retrieve episodic emotion knowledge for short time frames and semantic emotion knowledge for long time frames. In the present studies, we essentially reverse such associations. Rather than manipulating time-frame width and observing its effects on emotion judgment speed, we now hold time frame constant and observe the effects of judgment speed on emotion ratings. Based on the suggestion that fast emotion judgments for long time frames reflect semantic retrieval operations (Robinson & Clore, 2002b), we predicted that fast judgments for such time frames would be associated with ratings that are more consistent with one's level of global self-esteem. We term this hypothesized pattern a "semantic infusion effect" whereby generalized beliefs about the self are more likely to contribute to fast emotion judgments than slow ones.

To examine the specificity of these predictions, we asked a group of individuals in Study 3 to report on their momentary emotional experiences. Because episodic emotion knowledge should be relatively accessible under these circumstances (Robinson & Clore, 2002b), fast judgments in this condition would not be "semantically infused" or trait-consistent. The importance of this momentary condition of Study 3 is that it would help to support the two-process ideas that guided the investigation, while potentially ruling out some alternative interpretations. We revisit such issues in the general discussion.

Overview of Studies

The primary purpose of the present studies was to examine the prediction that fast judgments concerning one's emotions would be more trait-consistent than slow judgments, particularly for long time frames. We focused on self-esteem as the trait in question because self-esteem has been linked to ratings of both higher positive affect and lower negative affect in previous studies (Diener & Diener, 1995; Watson, Suls, & Haig, 2002). From the present perspective, however, self-esteem taps beliefs about one's typical emotional experiences that are likely to be more influential for long time frames relative to short ones (see Conner, Wood, & Barrett, 2003, for relevant evidence), and possibly for fast emotion judgments relative to slow ones.

Studies 1 and 2 examined our hypotheses in relation to self-reports of emotion over long time frames. If judgments of emotion over long time frames are preferentially made on the basis of semantic knowledge, then judgments made

quickly should be more semantically infused, whereas judgments made more slowly would presumably be influenced by a variety of other factors. Translating such predictions to the self-esteem context, the tendency for participants high in self-esteem to report more intense positive emotions and less intense negative emotions should be particularly apparent when emotion judgments are made quickly.

Study 3 presented participants with both long and short time frames in order to contrast semantic infusion effects related to the two time frames. The predictions for the long time frame (*in general*) were the same as in Study 1, which also involved this long time frame. For ratings concerning momentary experience (*right now*), on the other hand, judgment speed should no longer have the same consequences, precisely because participants could more easily access episodic emotion knowledge in this condition (Robinson & Clore, 2002b). Study 3, therefore, seeks to support the discriminant validity of our predictions for long time frames.

Study 1

Previous research of ours compared emotion judgment speed across different time frames such as *right now*, *last few months*, and *in general* (Robinson & Clore, 2002b). In the present studies, we sought to hold the time frame constant while determining whether we could use the relative speed of judgment as a clue to the use of different sources of self-knowledge retrieved on faster versus slower trials of the task. This goal led us to develop novel and careful procedures for quantifying judgment speed independent of individual differences in speed, particular emotion items, or repetitions of particular stimuli. Although such procedures may seem complex, they needed to be in order to remove some of the sources of reaction time (RT) variance that were not of interest here. The important point is that our goals related to assessment rather than to manipulation, and therefore our procedures for handling RT data were consistent with this assessment-related context rather than with procedures used in within-subject manipulation studies (Robinson, 2007).

In Study 1, as in the other studies, self-esteem was treated as a continuous variable, consistent with recommendations in the literature (Aiken & West, 1991). However, because the present studies concerned a two-process model, our treatment of judgment latencies was to classify them as fast versus slow per trial for each individual and emotion valence considered separately. This procedure was deemed best in relation to the two-process model, which proposes discrete processes for fast versus slow judgment latencies (Robinson & Clore, 2002b).

In Study 1, participants reported on their emotions *in general*, a time frame that we have proposed (Robinson & Clore, 2002a) and shown (Robinson & Clore, 2002b) favors the access of semantic emotion knowledge. Therefore, we predicted that fast emotion judgments for this time frame would be more semantically infused than would slow emotion judgments, a prediction that would be supported by a three-way interaction of self-esteem, emotion valence, and judgment speed. If such an interaction occurs, it would be novel to the literature and informative concerning self-esteem and emotion-judgment processes.

Method

Participants

Participants were 69 undergraduate volunteers from North Dakota State University. We did not specifically ask for demographic information in any of the studies, but

the nature of the participant pool is relatively easy to characterize. The vast majority of our participants were between the ages of 18 and 21, 60% were female, and 95% were Caucasian in race.

Self-esteem

Participants completed Rosenberg's 10-item (1965) self-esteem scale following the emotion judgment task described below. This scale involves agreeing or disagreeing with statements indicative of having a negative (e.g., "All in all, I am inclined to feel that I am a failure") or positive (e.g., "I take a positive attitude toward myself") view of the self. After reverse-scoring, items were averaged to create a single score for each participant (alpha = .85). Self-esteem scores were *z* scored prior to the analyses reported below.

Emotion Judgment Task

Judgment instructions. Participants were told that we were interested in their emotional experiences "in general". They were also told that we were interested in judgment speed and, therefore, that they should report on their emotions as quickly but accurately as possible. All emotion ratings were made on the same 5-point scale (1 = *none*; 2 = *a small amount*; 3 = *a moderate amount*; 4 = *a large amount*; 5 = *an extreme amount*).

Self-report adjectives. Self-report adjectives were selected on the basis of four considerations. First, an initial list of words was compiled from previous work related to the emotion lexicon (Shaver, Schwartz, Kirson, & O'Connor, 1987; Storm & Storm, 1987). Second, multi-word items (e.g., angry at self) were excluded because they would unduly slow judgment speed. Third, we desired an equal number of positive and negative emotion terms. Finally, we wanted at least 30 stimuli of each valence to insure an adequate number of trials. On the basis of these considerations, 30 clearly positive and 30 clearly negative emotion adjectives were selected as stimuli.[1]

The 60 adjectives were presented in a random order. To create a desirable number of trials for the 2 (Valence) × 2 (Speed) within-subject design, we decided to present the same 60 adjectives a second time. Participants were told that they might see a given adjective more than once, but that they should not worry about this possibility. Rather, they should approach each judgment independently. In total, there were 120 trials in the emotion judgment task, 60 involving positive emotions and 60 involving negative emotions.

Trial procedures. Given the goals of the current study, it was important to obtain emotion-rating data. In social judgment studies in which RT is of central interest, however, it has been recommended that no more than 5 rating categories be used (Fazio, 1990). We followed this advice because the rating scale used here involved 5 rating options (from 1 = *none* to 5 = *an extreme amount*), and this specific scale is consistent with a large body of work in the emotion-rating literature (Watson, 2000).

Additionally, the present studies sought to follow the procedures of Robinson and Clore (2002b), who presented a modified emotion judgment task in which retrieval time could, in principle, be dissociated from speed to make emotion ratings, specifically through the use of a two-response sequence. The first response reflects retrieval time, and is constant across all trials. The second response, however, requires the rating to be made subsequent to the first retrieval-time response. Ideally,

the first RT would be reflective of judgment time and the second would be irrelevant to judgment time (e.g., Robinson, Johnson, & Herndon, 1997).

More specifically, we used the following procedures from Robinson and Clore (2002b). Each trial began with a 100 ms blank screen. An emotion stimulus was then randomly selected by the computer program and placed in the middle of the screen along with the judgment scale. Participants were instructed to determine the extent to which they generally tend to feel the adjective in question. After deciding on a rating, they pressed the spacebar, at which point the stimulus disappeared. At the blank screen that followed, participants made their rating and then the next trial began.

Scoring Considerations for the Emotion Judgment Task

Preliminary considerations. Ideally, this two-response procedure would dissociate judgment time from rating time. There was some evidence for the success of the procedure in that time to press the spacebar was quite a bit longer ($M = 1302$ ms) than time to make the rating ($M = 555$ ms), $F > 1000$. However, additional analyses revealed problematic variation between individuals. Average rating times were quite variable across participants (range = 138 ms to 1425 ms). Thus, certain participants appeared to engage in rating decision processes only after pressing the spacebar. This conclusion is reinforced by the fact that spacebar and rating times were negatively correlated to a very strong degree, $r = -.81$, $p < .01$. That is, faster spacebar times were associated with slower rating times and vice versa. Given this strong inverse correlation, which was found in all studies, it simply seemed necessary to *add* judgment time and rating time to adequately characterize the retrieval process involved ($M = 1857$ ms).

In retrospect, it is easy to see why the two-response procedure was successful in the Robinson and Clore (2002b) studies, but not in the present ones. In the Robinson and Clore (2002b) studies, both the emotion item (e.g., *joyful*) and the time frame for the report (e.g., *last few weeks*) were manipulated on a trial-to-trial basis. The complex nature of such emotion by time frame judgments would seem to require deciding upon a judgment prior to pressing the spacebar, which removed both sources of information from the computer screen. In the present studies, however, time frame was constant across all trials and therefore only one piece of information—the emotion item in question—need be remembered subsequent to pressing the spacebar. This is a much easier task and one that apparently resulted in very different response strategies across individuals.

Thus, the two-response procedures of Robinson and Clore (2002b) failed in the present context. In the future, it would be useful to time-limit ratings to prohibit individuals from pressing the spacebar prior to deciding upon a rating for the trial (such procedures were used by Robinson & von Hippel, 2006). However, we do not believe that the use of a composite reaction time is problematic here for three reasons. First, most RTs in social judgment paradigms involve rating times (Fazio, 1990) rather than the careful two-response procedure that we sought to adopt here. Thus, our use of total response latencies is quite consistent with recommendations in the social cognition literature.

Second, when we examined correlations between spacebar times, rating times, and total times, we found that spacebar times predicted total times ($r = .72$, $p < .01$), whereas rating times did not ($r = -.19$, $p > .10$), and this was true in the other studies as well. Hence, the use of the composite RT measure reflected spacebar times to a much greater extent than it reflected rating times. Third, we found that

self-esteem did not predict spacebar times, $r = -.02$, $p > .85$, rating times, $r = .10$, $p > .35$, or total times, $r = .09$, $p > .45$, in Study 1, and identical conclusions were reached in the other studies as well. The bottom line is that the two-response procedures of Robinson and Clore (2002b) may have failed in the present context, but not in a way that would compromise our conclusions related to self-esteem and judgment time.

Scoring retrieval speed. Important to the present studies was a procedure for differentiating fast and slow retrieval efforts. Although this may seem a simple endeavor, it is not in the present context. Individuals differ markedly in average speed (e.g., Robinson & Oishi, 2006), and we needed to control for such variance. Certain emotion items (e.g., *joyful*) are almost certainly likely to be judged faster than others (e.g., *peaceful*), and we sought to control for such variance as well. Finally, to obtain an optimal number of trials, we repeated emotion items, and we needed to control for the effects of item repetition in the present context.

As an initial way of proceeding with our assessment-related goals, we performed a log-transformation of judgment times, which necessarily reduces the positive skew typical of them (Robinson, 2007). Although some scholars have recommended deleting particularly fast or slow RTs (e.g., Ratcliff, 1993), such a procedure did not seem warranted here. In contrast to simple cognitive paradigms, the present judgments were complex, in that they involved retrospection concerning the emotional experiences of the self. It is not clear what an outlier would consist of in the present context (e.g., it would be entirely reasonable for an individual to take 30 seconds to rate his/her *joyful* feelings in general). We therefore adopted the conservative procedure of treating all judgment times as valid retrieval efforts. This procedure could in no way bias the results because our handling of RT data was done quite independently of our knowledge of the self-esteem level of individuals.

Having decided it best not to delete any trials based on particularly fast or slow RTs, we could then consider the question of whether to replace particularly fast or slow RTs with cutoff scores, a procedure often referred to as "Windsorizing" (Ratcliff, 1993). In point of fact, such Windsorizing procedures would not alter our conclusions to any considerable extent. Faster judgments would still be faster judgments and slower judgments would still be slower judgments. Given our concerns related to deciding what constitutes an unreasonably fast or slow judgment here, we again adopted the conservative procedure of leaving log-transformed emotion judgment times unaltered.

Emotion rating means as a function of retrieval speed. The log-transformed emotion judgment latencies were subjected to further transformations to remove effects due to emotion item, emotion valence, and item repetition. First, we realized that certain emotions (e.g., *happy*) might tend to be judged faster than others (e.g., *interested*) for reasons that have more to do with item familiarity and word length than with the retrieval processes of primary interest. We therefore removed such variance by z-scoring response latencies for each of the 60 emotion items considered separately. That is, following the standardization, each item now had a mean of 0 and a standard deviation of 1 across participants. This ensures that the results cannot be due to particular emotion items being judged more quickly or slowly.

For each participant separately, we then grouped trials according to emotion valence (positive vs. negative) and item repetition (first vs. second). The first sorting procedure ensures that latencies are specific to an emotion valence and the second

sorting procedure ensures that latencies are specific to either the first or second presentation of the items. Following such transformations, we then contrasted emotion ratings given for the 15 fastest versus 15 slowest judgments for each combination of participant, emotion valence, and repetition of items. We again admit that these procedures are complex, but we firmly suggest that they are the best ones for making legitimate inferences in relation to the present assessment-related goals.

Results

Preliminary Analyses

In one preliminary analysis, we sought to examine whether self-esteem had implications for judgment speed. We examined log-transformed latencies as a function of Self-esteem, Emotion Valence, and their interaction, specifically using the General Linear Model procedures of SAS (Robinson, 2007). Within this analysis, there was a main effect for Valence, $F(1, 67) = 7.94$, $p < .01$, such that negative emotions were judged more quickly ($M = 1823$ ms), on average, than positive emotions ($M = 1891$ ms). However, there was no main effect for Self-esteem, $F < 1$, and no Self-esteem × Valence interaction, $F(1, 67) = 2.25$, $p > .10$. Thus, self-esteem had few implications for judgment time.

We then turned our attention to a second issue. Given the item transformation procedures used in the study, particular items were equally likely to contribute to fast or slow rating means, at least across participants. However, it is still possible that a particular emotion item (e.g., *happy*) might contribute to a fast rating mean for participants high in self-esteem, but to a slow rating mean for participants low in self-esteem. Such a differential assignment of items to fast and slow means could present some ambiguities in the interpretation of the results.

For this reason, we sought to establish that particular emotion items (e.g., *happy*) were not differentially assigned to fast or slow rating means on the basis of levels of self-esteem. To examine this issue, we started by dichotomizing self-esteem scores. We then calculated the frequency with which a particular item was designated as fast for one group of participants (e.g., those high in self-esteem), but as slow for the other group of participants (e.g., those low in self-esteem). The frequencies, calculated for each of the 60 emotion items separately, fell into one of four cells: fast/high self-esteem, fast/low self-esteem, slow/high self-esteem, and slow/low self-esteem. Given an unbiased assignment of items to fast and slow rating means, these frequencies should be relatively equal. On the other hand, given a biased assignment, they should be unequal. We performed 60 chi-square tests, one for each emotion item, to examine this issue. Across the 60 emotion items, the average χ^2 was 0.82, compared to a critical value of 3.84. In addition, only two of the 60 items (3.33%) corresponded to a $\chi^2 > 3.84$. Such results indicate that there was no differential assignment of items based on levels of self-esteem, and therefore the findings reported below cannot depend on such differential assignment issues.

Recall that each emotion item was presented twice, each time in a different random order. This was true in Study 1 as well as in the other studies. Before proceeding with our primary analyses, we sought to examine whether the critical results interacted with this repetition factor. They did not, either in Study 1 or in the other studies, all ps $> .15$. Therefore, the primary analyses within all studies collapsed across this repetition variable.

Primary Analysis

To examine our primary hypotheses, we used the general linear model (GLM) procedures of SAS to simultaneously examine all main effects and interactions resulting from the 2 (Valence: positive vs. negative) × 2 (Speed: fast vs. slow) within-subject design in combination with the between-subjects factor of Self-esteem. The within-subject design is equivalent to a repeated-measures ANOVA. Interactions involving Self-esteem, however, are conceptually more similar to procedures used for testing interactions within multiple regression (Robinson, 2007). The GLM procedure, then, allowed us to examine the full design without dichotomizing self-esteem scores. Effects involving Self-esteem were estimated by substituting low (-1 *SD*) and high ($+1$ *SD*) self-esteem scores into the relevant regression equations (Aiken & West, 1991).

Main effects for Self-esteem, $F(1, 67) = 1.02$, $p > .30$, and Speed, $F < 1$, were not significant. A main effect for Valence, $F(1, 67) = 190.22$, $p < .01$, indicated that participants reported more positive ($M = 3.56$) than negative ($M = 1.98$) emotional experiences. This result is typical of normal samples (Diener & Diener, 1995).

All 2-way interactions were significant. The Self-esteem × Valence interaction, $F(1, 67) = 22.55$, $p < .01$, was due to the fact that positive emotion ratings were higher among individuals high in self-esteem ($M = 3.89$) relative to low in self-esteem ($M = 3.23$), $t(1, 68) = 3.96$, $p < .01$, whereas negative emotion ratings were higher among individuals low in self-esteem ($M = 2.20$) relative to high in self-esteem ($M = 1.76$), $t(1, 68) = -2.98$, $p < .01$. This result indicates that self-esteem has opposite implications for the experience of positive and negative emotions, a result that is consistent with prior findings (e.g., Brown, 1998).

There was also a Self-esteem × Speed interaction, $F(1, 67) = 4.83$, $p < .05$. Participants low in self-esteem reported lesser emotional intensity when they made their ratings quickly ($M = 2.68$) versus more slowly ($M = 2.75$), $t(1, 68) = 5.01$, $p < .01$. By contrast, participants high in self-esteem reported slightly more emotional intensity when they made their ratings quickly ($M = 2.84$) versus more slowly ($M = 2.80$), although the latter comparison was not significant, $t(1, 68) = 1.17$, $p > .20$.

Of more interest were the remaining interactions. The 2-way Valence × Speed interaction was significant, $F(1, 67) = 35.15$, $p < .01$. Positive emotion ratings were higher when the judgments were made quickly ($M = 3.62$) rather than slowly ($M = 3.50$), $t(1, 68) = 3.04$, $p < .01$. Judgment speed had opposite implications for negative emotions, as negative emotion ratings were lower when the judgments were made quickly ($M = 1.90$) rather than slowly ($M = 2.06$), $t(1, 68) = -3.34$, $p < .01$. This (Valence × Speed) interaction is consistent with the hypothesis that generalized emotion knowledge concerning the self tends to be biased in the direction of a greater degree of subjective well-being than is actually experienced on a momentary basis (Robinson & Clore, 2002a, 2002b).

Finally, and of most importance, was a Self-esteem × Valence × Speed interaction, $F(1, 67) = 4.79$, $p < .05$. We used the relevant regression equations to estimate rating means for those low (-1 *SD*) and high ($+1$ *SD*) in self-esteem for each of the cells of interest. Estimated means pertaining to the 3-way interaction are displayed in Table 1, which further suggests different effects of speed at low and high levels of self-esteem. To better and more simply characterize the pattern of findings, we computed means to reflect the overall tendency to report more positive emotions, and less negative emotions, within the context of fast judgments, i.e.: (positive/fast + negative/slow) – (positive/slow + negative/fast). The relevant means are shown in Figure 1. The *y*-axis is labeled subjective well-being, which consists of higher experiences of positive affect and lower experiences of negative affect (Diener, Suh,

TABLE 1 Estimated Means Pertaining to Self-esteem × Valence × Speed Interactions, Studies 1 and 2

Study	Valence	Self-esteem	Speed		
			Fast	Slow	Difference
(1)	Negative	Low	2.11	2.28	−0.17
		High	1.67	1.84	−0.17
	Positive	Low	3.24	3.23	+0.01
		High	4.00	3.77	+0.23
(2)	Negative	Low	2.93	2.84	+0.09
		High	1.86	2.05	−0.19
	Positive	Low	3.31	3.30	+0.01
		High	4.09	3.90	+0.19

Note: The Difference column highlights the effect of judgment speed at each level of self-esteem and emotion valence.

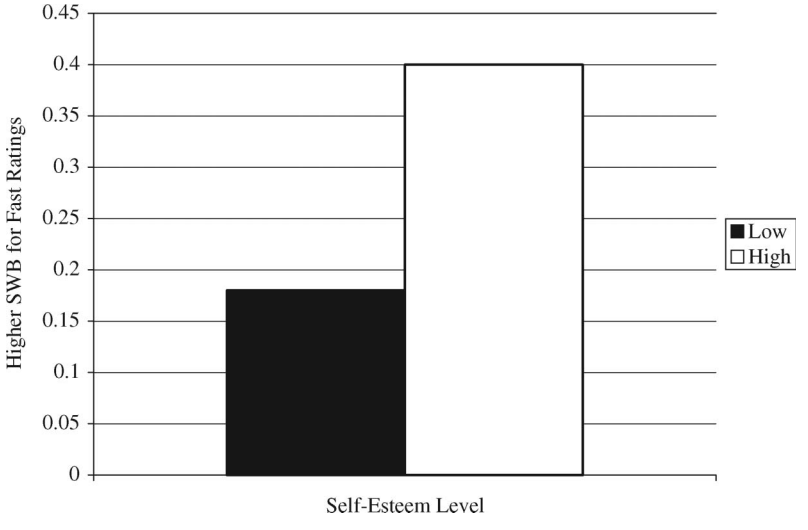

FIGURE 1 Tendencies to report higher levels of subjective well-being (SWB) as a function of self-esteem and judgment speed, Study 1.

Lucas, & Smith, 1999) and thus most conveniently summarizes the findings. As the figure indicates, participants high (+1 *SD*) in self-esteem reported higher levels of subjective well-being when they made their judgments quickly, $t(1, 68) = 5.71$, $p < .01$; the same tendency, although significant, was markedly weaker among participants low (−1 *SD*) in self-esteem, $t(1, 68) = 2.60$, $p < .05$. The self-esteem difference was significant, $t(1, 68) = 2.19$, $p < .05$.

Discussion

As predicted, emotion ratings were more consistent with generalized beliefs related to self-esteem when judgments were made quickly. The nature of this three-way

interaction was consistent with our semantic-infusion predictions. Individuals high in self-esteem believe that they experience more positive than negative emotion and their faster judgments were consistent with this belief. On the other hand, individuals low in self-esteem have more mixed beliefs concerning their emotional experiences (e.g., Diener & Diener, 1995), and thus judgment speed was less important at low levels of self-esteem. It is important to note that we did not expect a reversal at low levels of self-esteem because it is simply the case that very few people believe that they experience more negative than positive emotions (Robinson & Kirkeby, 2005) and the particular sample here is not likely to include many of these potentially pathological cases. These considerations explain why judgment speed played a larger role in moderating the ratings of those high (relative to low) in self-esteem.

Study 2

The main purpose of Study 2 was to replicate and extend the results of Study 1. The materials and procedures were identical to those used in Study 1, except for the time frames involved. By random assignment, 17 participants were asked to report on their emotions over the *last couple of months* and 20 participants were asked to report on their emotions over the *last couple of years*. These time frames, like the generalized time frame examined in Study 1, tend to be too wide to support an episodic retrieval strategy (Robinson & Clore, 2002b) and we therefore expected similar results.

Results

Preliminary Analyses

Recall that participants were instructed to determine their rating prior to pressing the spacebar. As in Study 1, spacebar times ($M = 1283$ ms) were quite a bit longer than rating times ($M = 511$ ms), $F > 1000$, but there was again the problematic finding that average spacebar times were inversely correlated with average rating times, $r = -.81$, $p < .01$, necessitating the use of a total judgment time measure ($M = 1794$ ms). Correlations of average spacebar time, average rating time, and average total time again indicated that the total time measure is predominantly reflective of spacebar time, $r = .83$, $p < .01$, relative to rating time, $r = -.34$, $p < .05$, and self-esteem ($\alpha = .83$) did not correlate with any of these average times, ps $> .05$. An additional analysis revealed that there was no effect for Self-esteem on total judgment speed, $F < 1$, nor was there a Self-esteem × Valence interaction, $F(1, 35) = 2.66$, $p > .10$. Individual trials were assigned to fast and slow judgment latencies as in Study 1.

To determine whether individual emotion items tended to be differentially assigned on the basis of self-esteem, we performed item-level analyses as in Study 1. Specifically, given an unbiased assignment to fast and slow rating means, the following cell frequencies should be approximately equal: fast/high self-esteem, fast/low self-esteem, slow/high self-esteem, and slow/low self-esteem. We evaluated whether this tended to be the case through the use of 60 chi-square tests, one for each of the 60 emotion items. The average χ^2 value was 1.16. Only three (i.e., 5%) of the 60 items exceeded the critical value of 3.84. Moreover, the particular items that exceeded chance differed from the two items in Study 1. Thus, the findings reported below are not compromised by differential item assignment based on self-esteem.

Primary Analysis

Rating means were examined as a function of a Self-esteem × Valence × Speed × Condition (i.e., last few months vs. last few years) GLM design. Considering first the main effects, there was a main effect for Valence, $F(1, 33) = 80.90$, $p < .01$, such that ratings were higher for positive emotions ($M = 3.65$), on average, than for negative emotions ($M = 2.42$). The other main effects were not significant, Fs < 1.

Replicating Study 1, there was a Self-esteem × Valence interaction, $F(1, 33) = 33.08$, $p < .01$. In relation to positive emotions, participants high in self-esteem reported higher levels of them ($M = 4.00$) than did participants low in self-esteem ($M = 3.30$), $t(1, 36) = 3.23$, $p < .01$. In relation to negative emotions, by contrast, participants low in self-esteem reported higher levels of them ($M = 2.88$) than did participants high in self-esteem ($M = 1.95$), $t(1, 36) = -4.95$, $p < .01$.

In addition, a Valence × Speed interaction, $F(1, 33) = 5.37$, $p < .05$, also replicated Study 1. Participants reported more positive emotions when they made their judgments quickly ($M = 3.70$) versus more slowly ($M = 3.60$), $t(1, 36) = 2.40$, $p < .05$. By contrast, they reported less negative emotions when they made their judgments quickly ($M = 2.39$) versus more slowly ($M = 2.44$), $t(1, 36) = -0.87$, $p > .35$. Although the speed effect on negative emotion ratings was not significant in this study, the interactive pattern is again consistent with the notion that semantic beliefs concerning the self's emotions tend to be polarized in a positive direction relative to episodic experiences (Robinson & Clore, 2002a).

Finally, and of critical importance, Study 2 replicated the Self-esteem × Valence × Speed interaction, $F(1, 36) = 12.26$, $p < .01$. All other effects, including those particular to Condition, were not significant, ps $> .25$. In determining the nature of the significant three-way interaction, we calculated estimated means, as shown in the bottom panel of Table 1. To simplify the presentation of the results, we calculated a single score to reflect the tendency to report higher levels of positive emotion, as well as lower levels of negative emotion, when ratings were made quickly, i.e.: (positive/fast + negative/slow) – (positive/slow + negative/fast). These speed-related scores were then graphed in Figure 2. As in Study 1, the y-axis is labeled in terms of subjective well-being, which reflects the relative balance of positive to negative emotion (Diener et al., 1999). As suggested by the figure, individuals high (+1 *SD*) in self-esteem reported higher levels of subjective well-being when they made their ratings quickly (vs. slowly), $t(1, 36) = 4.20$, $p < .01$. On the other hand, there was no such speed-related effect among individuals low (−1 *SD*) in self-esteem, $t(1, 36) = -0.86$, $p > .35$. The difference between low and high self-esteem scores was significant, $t(1, 36) = 3.55$, $p < .01$.

Discussion

Consistent with a prior analysis (Robinson & Clore, 2002b), the processes that support answering self-report questions for long time frames were fundamentally the same whether the time frame pertained to the last few years or to the last few months. The results involving both of these time frames mirrored the generalized time frame used in Study 1 to a substantial extent. The results of Study 2 go beyond these prior results in demonstrating the predictable consequences of faster judgment latencies with reference to long time frames.

As in Study 1, there was a normative tendency such that faster judgments were associated with higher positive emotion ratings, and lower negative emotion ratings, at least in interactive terms. In addition, and of more importance, the results of

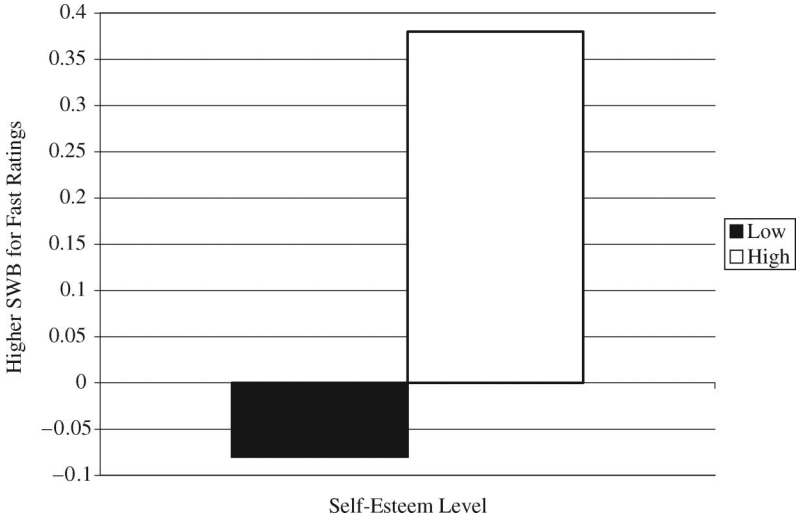

FIGURE 2 Tendencies to report higher levels of subjective well-being (SWB) as a function of self-esteem and judgment speed, Study 2.

Study 2 established that this normative tendency was present among individuals high in self-esteem and absent among individuals low in self-esteem, again presumably because the semantic emotion knowledge of low self-esteem individuals is evaluatively more mixed (Robinson & Clore, 2002a). In sum, the results are consistent with the idea that heuristic or fast judgment strategies are polarized in a self-enhancing direction to a much greater extent among individuals high in self-esteem.

Study 3

Although the prior results are consistent with the two-process model that guided our predictions, our results may be consistent with other theoretical frameworks as well, and we consider other theoretical frameworks in the general discussion. For now, it is important to point out that semantic infusion effects of the present type are only hypothesized to occur when the time frame is wider than the *last few weeks* (Robinson & Clore, 2002b). For time frames shorter than this, the default tendency should be to retrieve episodic emotion knowledge (Robinson & Clore, 2002a). Because such episodic emotion knowledge is specific to time and place and not part of a semantic memory system (Tulving, 1984, 1993), one would expect fast judgments for short time frames to behave quite differently. Specifically, such fast judgments should *not* be semantically infused according to the two-process model that guided our predictions.

To assess this hypothesis, we randomly assigned individuals to time frames thought to best tap retrieval processes related to episodic and semantic emotion knowledge (see Robinson & Clore, 2002a, for a review). Specifically, some individuals were asked to report on their momentary emotional experiences (episodic emotion condition), whereas others were asked to report on their emotional experiences in general (semantic emotion condition). If the two-process model interpretation of Studies 1 and 2 is correct, then the pattern observed in the

prior studies should only be observed in the generalized condition of Study 3. Indeed, we might expect somewhat of a reversal among individuals reporting on their momentary emotional experiences. Study 3 is unique in its ability to weigh in on such issues.

Method

Participants

Participants were 44 undergraduate volunteers from North Dakota State University.

Between-subjects Manipulation

By random assignment, 23 of the 44 participants were asked to report on their momentary emotional experiences. The remaining 21 participants were asked to report on their emotional experiences in general.

Emotion Judgment Task

The emotion judgment task was similar to the task used in Studies 1 and 2 except that we presented 40, rather than 60, emotion adjectives.[2] As in the prior studies, participants rated their experience of each emotion adjective twice, each time in a different random order. This produced 80 trials overall. Following the emotion judgment task, participants completed Rosenberg's (1965) self-esteem scale ($\alpha = .82$).[3]

Emotion Rating Means

The procedures for obtaining rating means were identical to those reported in Study 1.

Results

Preliminary Analyses

Average time to press the spacebar was considerably longer ($M = 1687$ ms) than average rating time ($M = 558$ ms), $F > 1000$. However, as in prior studies, average time to press the spacebar was inversely correlated with average time to make ratings, $r = -.63$, $p < .01$. It therefore appears that some participants followed task instructions, whereas others engaged in considerable processing subsequent to pressing the spacebar. We therefore added spacebar and rating times to better quantify the overall speed of judgment ($M = 2244$ ms), as in Studies 1 and 2. Total times were more highly correlated with spacebar times, $r = .85$, $p < .01$, than with rating times, $r = -.13$, $p > .35$. Self-esteem did not correlate with any of these judgment time measures, $ps > .05$.

Total time judgment latencies were log-transformed to reduce skew. We then analyzed such judgment latencies within a Self-esteem × Condition × Valence GLM analysis. There was a marginal main effect for Self-esteem, $F(1, 40) = 2.93$, $p < .10$, such that participants higher in self-esteem tended to make their judgments more quickly ($M = 2008$ ms) than participants low in self-esteem ($M = 2292$ ms). There was also a Self-esteem × Valence interaction, $F(1, 40) = 7.32$, $p < .05$. Although participants higher in self-esteem made their judgments more quickly, this was particularly pronounced for positive emotion trials ($Ms = 2340$ ms and 1916 ms for low and high self-esteem levels, respectively), $t(1, 43) = -2.54$, $p < .05$, relative to negative emotion trials ($Ms = 2244$ ms and 2101 ms for low and high self-esteem

levels respectively), $t(1, 43) = -1.06$, $p > .25$. Although it is tempting to conclude that the momentary condition of Study 3 could have been responsible for the Self-esteem × Valence interaction, there was in fact no Self-esteem × Condition × Valence interaction, $F < 1$. Because there was no hint of moderation by condition, we regard the significant Self-esteem × Valence interaction as anomalous given the results of Studies 1 and 2, which did not find such an interaction. None of the other effects on judgment latencies were significant, Fs < 1.

Individual items were assigned to fast versus slow rating means as in Studies 1 and 2. In a second preliminary analysis, we sought to show that such assignments were random in nature. To establish this, we conducted chi-square tests at the emotion item level. The average χ^2 was 0.95. Of the 40 item-level tests, there were only two (5%) cases in which items were differentially assigned to fast or slow means on the basis of self-esteem level. Moreover, these two emotion items were different than in prior studies. We therefore conclude that the assignment of items to fast versus slow rating means was independent of levels of self-esteem.

Primary Analysis

Rating means were examined as a function of a 2 (Valence: positive vs. negative) × 2 (Speed: fast vs. slow) within-subject design in combination with the between-subjects variables represented by Condition, Self-esteem, and the Condition × Self-esteem interaction. The GLM procedures of SAS were used and estimated means were calculated for interactions involving self-esteem (+ or −1 *SD*).

Main effects related to Self-esteem, $F < 1$, and Condition, $F(1, 40) = 1.99$, $p > .15$, were not significant. A main effect for Valence, $F(1, 40) = 111.24$, $p < .01$, was due to the fact that participants reported more positive ($M = 3.34$) than negative ($M = 2.07$) emotions. There was also a main effect for Speed, $F(1, 40) = 10.16$, $p < .01$, such that slow judgments were associated with higher ratings ($M = 2.75$) than fast judgments were ($M = 2.66$). There were no two-way interactions involving the Condition variable, ps $> .30$. As in Studies 1 and 2, there was a Self-esteem × Valence interaction, $F(1, 40) = 14.09$, $p < .01$. In relation to positive emotions, individuals high in self-esteem reported higher levels of intensity ($M = 3.63$) than did individuals low in self-esteem ($M = 3.02$), $t(1, 43) = 2.38$, $p < .05$. By contrast, in relation to negative emotions, individuals low in self-esteem reported higher levels of emotional intensity ($M = 2.33$) than did individuals high in self-esteem ($M = 1.83$), $t(1, 43) = -2.63$, $p < .05$.

Of the remaining two-way interactions, the one involving Self-esteem × Speed was not significant, $F(1, 40) = 2.42$, $p > .10$. However, the Valence × Speed interaction was significant, $F(1, 40) = 6.78$, $p < .05$. As in Studies 1 and 2, there was a normative tendency to report higher levels of positive emotion when ratings were made more quickly ($M = 3.34$) versus more slowly ($M = 3.33$), $t < 1$, but to report lower levels of negative emotion when ratings were made more quickly ($M = 1.98$) versus more slowly ($M = 2.17$), $t(1, 43) = -4.89$, $p < .01$. Although only the latter main effect for speed was significant in Study 3, the interactive pattern is consistent with the prior studies. This Valence × Speed interaction did not vary by condition, as there was no Condition × Valence × Speed interaction, $F < 1$.

Consistent with predictions, the Condition × Self-esteem × Valence interaction was significant, $F(1, 40) = 4.59$, $p < .05$. Based on the idea that people use semantic sources of emotion knowledge particularly when the time frame is wide (Robinson & Clore, 2002b), we would expect the Self-esteem × Valence interaction to be particularly pronounced in the general condition relative to the condition involving momentary emotional experiences. Indeed, this was the case. In the general reporting

condition, there was a Self-esteem × Valence interaction, $F(1, 19) = 27.04$, $p < .01$, such that positive emotion reports were higher among participants high in self-esteem ($M = 3.93$) relative to those low in self-esteem ($M = 3.09$), $t(1, 20) = 4.29$, $p < .01$. By contrast, in this same condition, individuals low in self-esteem reported more intense negative emotional experiences ($M = 2.46$) than did individuals high in self-esteem ($M = 1.81$), $t(1, 20) = -3.05$, $p < .01$. In the condition involving momentary feelings, on the other hand, there was no Self-esteem × Valence interaction, $F < 1$. In sum, when collapsing across the speed variable, self-esteem predicted higher reports of positive emotion and lower reports of negative emotion *only* when individuals were asked to report on their emotions in general.

Considering the remaining interactions, the Condition × Self-esteem × Speed interaction was significant, $F(1, 40) = 5.62$, $p < .05$, and the Self-esteem × Valence × Speed interaction was marginal, $F(1, 40) = 3.01$, $p < .10$. However, neither interaction appeared particularly interpretable. Of most importance, and a central prediction of the study, was a significant Condition × Self-esteem × Valence × Speed interaction, $F(1, 40) = 8.06$, $p < .01$. To understand the 4-way interaction, we used regression equations to estimate rating means for those high versus low in self-esteem within each Condition × Valence × Speed cell of the design. These estimated means are displayed in Table 2.

To better clarify the nature of the four-way interaction, we calculated a single score to reflect the tendency to report higher levels of positive emotion, along with lower levels of negative emotion, within the context of fast judgments, i.e.: (positive/fast + negative/slow) – (positive/slow + negative/fast). Such scores were graphed as a function of self-esteem and condition in Figure 3. In the generalized condition of the study, speed effects were absent among individuals low (-1 *SD*) in self-esteem, $t(1, 20) = 0.55$, $p > .55$, and marginally present among individuals high ($+1$ *SD*) in self-esteem, $t(1, 20) = 1.99$, $p < .10$. Although the difference by self-esteem was not significant, $t(1, 20) = 1.12$, $p > .25$, the pattern was similar to Studies 1 and 2. By contrast, the momentary condition of Study 3 led to a dramatically different pattern of findings. Here, speed effects were significant among individuals low in self-esteem, $t(1, 22) = 3.19$, $p < .01$, but absent among individuals high in self-esteem, $t(1, 22) = -0.70$, $p > .45$, and this difference by self-esteem was significant,

TABLE 2 Estimated Means Pertaining to the Condition × Self-esteem × Valence × Speed Interaction, Study 3

			Speed		
Condition	Valence	Self-esteem	Fast	Slow	Difference
General	Negative	Low	2.40	2.52	−0.12
		High	1.73	1.89	−0.16
	Positive	Low	3.06	3.12	−0.06
		High	3.95	3.90	+0.05
Momentary	Negative	Low	2.01	2.25	−0.24
		High	1.86	2.00	−0.14
	Positive	Low	3.19	2.92	+0.27
		High	3.14	3.39	−0.25

Note: The Difference column highlights the effect of judgment speed at each level of self-esteem and emotion valence.

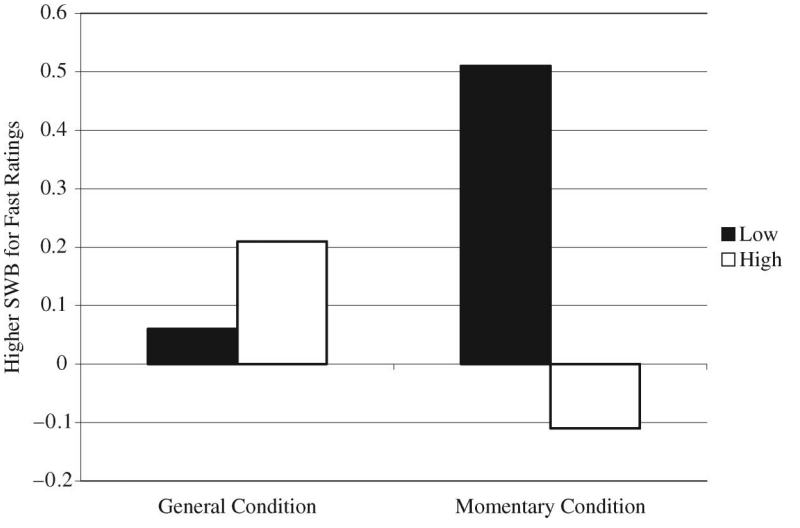

FIGURE 3 Tendencies to report higher levels of subjective well-being (SWB) as a function of self-esteem, judgment speed, and time frame condition, Study 3.

$t(1, 22) = -2.51$, $p < .05$. In sum, judgment speed was associated with very different consequences in the two time-frame conditions.

Discussion

Predictions in the present studies followed from the two-process model of emotional self-report (Robinson & Clore, 2002a). In the investigation of trait-linked semantic infusion effects, Studies 1 and 2 used several long time frames, which are thought to reflect semantic emotion knowledge concerning the self. In these studies, it was found that fast (relative to slow) judgments were associated with ratings that were more consistent with trait self-esteem. These "semantic infusion" effects were interpreted as supporting the two-process model that guided our predictions. However, these results could be consistent with other theoretical frameworks as well, especially given that there was no manipulation of time frame in these studies.

Study 3 was important, therefore, because it sought to contrast the effects of judgment speed for a semantic time frame (*in general*) versus an episodic time frame (*right now*). If our reliance on the two-process model is correct, judgment speed should have potentially opposite implications for rating means in the two conditions. In support of this point, we found evidence for the hypothesized four-way interaction. Although the generalized condition of Study 3 was suggestive of a semantic infusion effect for fast judgments, this was not the case for the momentary condition of the study. These data thus suggest that the results of Studies 1 and 2 are dependent on reporting on one's emotions over long time frames, consistent with the two-process model that guided our predictions.

Although the four-way interaction was predicted, we should mention that some of the specific details of the lower-order effects departed somewhat from expectation. In the generalized condition of Study 3, considered alone, the self-esteem difference in semantic infusion was not significant. We suspect that this was due to the smaller sample size and fewer trials involved, relative to the first two studies. We predicted

that results in the momentary condition would exhibit a very different pattern, and clearly the results supported this expectation. However, we must also admit that we had no *a priori* expectation for the specific pattern observed, other than that it would be quite different. We therefore conclude that further theory and data would be useful before we can be confident concerning the psychological significance of judgment speed in relation to one's current emotions.

General Discussion

Summary and Interpretation of Findings

In the present studies, we focused on global self-esteem, which has predicted both positive affect and negative affect in previous self-report studies (Diener et al., 1999; Watson et al., 2002). Although we have no major reason to dispute such consistent relations, we do have reason to believe that they may in part be driven by semantic memory biases. Along these lines, for example, Conner et al. (2003) found that global self-esteem biased retrospective memory for emotions and other experiences in a trait-consistent direction, specifically relative to an online reporting condition. Story (1998) reported similar memory biases linked to global self-esteem.

According to the two-process framework that guided our predictions, such retrospective distortions in a trait-consistent direction are to be expected (Robinson & Clore, 2002a). Specifically, when individuals are asked to report on retrospective or trait judgments of emotion, access to relevant episodic facts should be difficult to retrieve. This is thought to lead individuals to rely on their generalized emotion beliefs instead. Previous studies have provided some empirical support for this two-process model (e.g., Robinson & Clore, 2002b; Robinson & Oishi, 2006; Tamir & Robinson, 2004), but none of these studies investigated predictions related to global self-esteem or used judgment speed as an online predictor of the likelihood of such semantic infusion effects.

If we are correct that judgments of emotion over long time frames are preferentially made on the basis of semantic emotion knowledge concerning the self (Robinson & Clore, 2002b), then faster judgments of emotion should be more trait-consistent, but only when long time frames are involved. Studies 1 and 2 found support for this prediction in that relations between global self-esteem and subjective well-being were more pronounced when emotion judgments were made quickly. Study 3 was important because it randomly assigned individuals to report on their momentary or generalized emotions. Because the semantic infusion effect should be particular to long time frames (Robinson & Clore, 2002a), the momentary condition of this study should not be associated with a similar pattern of findings. Indeed, it was not. Implications of these findings, and their relation to other theoretical frameworks, are discussed next.

Other Theoretical Frameworks

The two-process model that guided our predictions shares some features with other theoretical models, yet was derived from an independent research tradition related to emotional self-report (Robinson & Clore, 2002a). In the present section, we highlight both similarities and differences among the models. It should be mentioned that the present studies were not designed to pit different models of self-report against each

other, but that there are certain nuanced aspects of our findings that do seem to be uniquely predicted by our two-process model.

A first point relates to our view of self-esteem. We have linked low self-esteem to beliefs about the self's emotions that are more evaluatively mixed in nature, and this suggestion is consistent with prior work (e.g., Conner et al., 2003; Diener & Diener, 1995). Yet, there are other data suggesting that self-esteem may also relate to self-certainty because high self-esteem individuals appear more certain of their self-concepts (e.g., Baumgardner, 1990; Campbell, 1990). We do not dispute the latter data, but rather note that the mixed self-views of individuals low in self-esteem may be entirely consistent with lower self-certainty. Indeed, Campbell (1990) made this point in her suggestion that mixed evaluative knowledge concerning the self would typically engender less self-certainty.

Because more mixed self-evaluations are associated with lower levels of self-certainty, it is difficult to disentangle these two sorts of correlates of global self-esteem. This led Campbell and colleagues to develop a separate measure of self-concept clarity (Campbell et al., 1996). Because we did not administer this measure here, we cannot be sure that our results are specific to global self-esteem relative to self-concept clarity. However, because support for the present two-process model has involved many individual difference variables such as sex (e.g., Robinson et al., 1998), age (e.g., Ready et al., 2006), extraversion (e.g., Robinson & Oishi, 2006), neuroticism (e.g., Robinson & Clore, 2007), and life satisfaction (e.g., Robinson & von Hippel, 2006), the self-certainty framework appears limited in accounting for the wider pattern of findings that we have previously reported in relation to our two-process model.

Harber (2005) recently presented a novel perspective on global self-esteem. The model is a judgment-related one and it contends that the relation between affect and judgment might systematically vary by self-esteem. Individuals high in self-esteem have learned to trust their momentary feelings, and they therefore rely on them when making social judgments. By contrast, individuals low in self-esteem have learned to distrust their momentary feelings, and they therefore discount them when making social judgments. Three studies provided support for this framework. However, the results were quite specific to a paradigm in which the perceived distress of baby cries predicted self-reported emotional reactions to such cries to a much greater extent among individuals high in self-esteem.

Leaving aside the very specific nature of these results (Harber, 2005), it is useful to consider whether related principles apply here. By and large, it is difficult to see a direct overlap. We did not manipulate mood, nor does it seem that online mood states were responsible for our findings. Consider Study 3 in this connection, which found that self-esteem was not generally predictive of online mood states. Because of this fact, we regard our findings as quite independent of self-esteem-linked differences in online mood states.

We next consider our results in relation to the "automatic egotism" model of Paulhus. In several studies, Paulhus has shown that manipulations of affective distraction (Paulhus & Levitt, 1987) or attentional load (Paulhus, Graf, & Van Seist, 1989) lead to normative tendencies toward self-enhancement when judging the traits of the self. Such findings are especially interesting in suggesting a form of automatic egotism characteristic of many individuals, but it is difficult to see how such a framework could explain the present results. One, we did not distract, load, or time-limit responses in the present studies. Two, it is important to note that the "automatic egotism" model is one that pertains to normative effects, but our results

suggested a critical moderating role for self-esteem. Three, faster judgments in the present studies were not invariantly associated with trait-linked self-enhancement, specifically within the momentary condition of Study 3. For these reasons, it is appears difficult to ascribe our results to automatic egotism of the sort shown by Paulhus in previous studies.

Finally, we acknowledge relations between our two-process model and the related two-process model known as construal level theory (CLT; Trope & Liberman, 2003). Like these authors, we make a distinction between two types of conceptualization, one linked to concrete, situation-bound representation (in our language, episodic knowledge; in CLT, low-level construal) and the other linked to abstract, decontextualized representation (in our language, semantic knowledge; in CLT, high-level construal). Both models also focus in part on the relevance of time frame in how information is processed or represented. Based on numerous studies examining the CLT model, there is little doubt that temporally distant (near) time frames lead individuals to represent information at a high (low) level of construal, as do other variables like physical proximity that influence psychological distance (e.g., Fujita, Trope, Liberman, & Levin-Sagi, 2006; Liberman, Trope, & McCrea, 2007).

Importantly, though, the CLT framework has been relatively silent on individual difference variables, whereas this has always been a central focus of the present two-process theory (see Robinson & Sedikides, in press, for a review). Some reconciliation of CLT and the present results is possible if one posits that individuals high in self-esteem possess abstract emotional self-knowledge that is more self-enhancing than do individuals low in self-esteem. Indeed, this is precisely the theoretical angle taken here.

Additional Implications and Future Directions

The present results extend the two-process theory of emotional self-report (Robinson & Clore, 2002a, 2002b). One important extension relates to individual differences. In prior work, we suggested that trait-related constructs—like self-esteem—can be viewed in terms of beliefs about the self. However, we did not provide a great deal of empirical evidence for this mapping. The present work, by contrast, was centrally concerned with the processes by which trait-related knowledge comes to influence emotion ratings (or not). The results suggest that trait-related knowledge is neither inert in nature, nor a ubiquitous influence on self-report, but rather that such knowledge is a source of information that can be, but need not be, retrieved in the particular judgment context.

Another important extension relates to judgment processes for a given time frame considered individually. Robinson and Clore (2002b) used latencies to understand normative retrieval strategies (i.e., short time frame = episodic; long time frame = semantic). However, such mappings were made with little attention to the likelihood that retrieved sources of knowledge could vary on a trial-to-trial basis. Thus, one important contribution of the present results was to suggest that the speed of retrieval provides an important, objective clue to the underlying nature of the self-report process, even within the context of trial-to-trial variations within individuals.

It seems possible to adopt the present methods to other research questions. For example, a straightforward extension might consider the question of whether trait judgments, too, are more consistent with global self-esteem when such judgments are made quickly. This possibility seems entirely intuitive to us, and yet we know of no data along these lines. Another extension is to consider whether fast judgments of the

self are indicative of a broader pattern of self-enhancing tendencies, as has been recently suggested (Holtgraves, 2004). In general, any context in which fast judgments could reflect heuristic judgment processes, it seems possible that the sort of trial-to-trial assessment procedures developed here could be useful in refining our understanding of the retrieval operations involved in self-report. We therefore offer our methods and findings in this broader theoretical context.

Notes

1. Positive emotion terms were: admiration, affection, bold, brave, cheerful, confident, delighted, eager, elated, energetic, enthusiastic, excited, glad, gratified, happy, inspired, interested, joyful, lively, loving, passionate, peaceful, pleasant, pleased, positive, proud, respect, strong, thrilled, and worthy. Negative emotion terms were: afraid, agony, angry, annoyed, anxious, ashamed, bitter, blue, dejected, depressed, disappointed, distressed, down, fearful, frightened, gloomy, guilty, hostile, irritable, jittery, lonely, miserable, moody, nervous, regret, sad, scared, stressed, upset, and worried.
2. Positive emotion terms were: affection, cheerful, confident, delighted, elated, energetic, enthusiastic, excited, gratified, happy, inspired, interested, joyful, lively, passionate, peaceful, pleasant, proud, thrilled, and worthy. Negative emotion terms were: afraid, angry, annoyed, anxious, ashamed, blue, depressed, disappointed, distressed, down, fearful, frightened, guilty, irritable, lonely, miserable, moody, nervous, upset, and worried.
3. In addition, for reasons that are irrelevant to the current report, participants were asked to rate their own emotional experiences in addition to the emotional experiences of an average person of their own age group. Trials involving the self and an average person were randomly assigned to trial sequence. To make it clear which target was involved on that particular trial, each trial began with the presentation of the target (*self* or *person*) in addition to the emotion in question (e.g., *inspired*). Only trials involving the self were retained for analysis.

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