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BRIEF REPORT

Looking for Clouds in a Silver Lining: Self-Esteem, Mental Simulations, and Temporal Confidence Changes

Lawrence J. Sanna and Susanne Meier

Washington State University

Two studies demonstrated that the relations between mental simulations and confidence are further moderated by self-esteem. In Study 1, low-self-esteem (LSE) students' confidence on exam day was lessened in comparison to 3 weeks prior, and this was shown to correlate with upward simulations and negative affect. In contrast, high-self-esteem (HSE) students' confidence did not decrease as the exam approached. In Study 2, upward simulations were manipulated directly before laboratory tasks. When performance was immediate, LSE participants instructed to assimilate upward simulations behaved like HSE participants, whereas HSE participants instructed to contrast upward simulations behaved like LSE participants, suggesting that a mechanism involving differing construals of upward simulations may be responsible for temporal confidence changes among the two groups.

Mentally simulating alternative outcomes is a ubiquitous aspect of people's experience with broad theoretical and practical significance. Contemplating an imminent exam in an important college course, preparing for a business meeting with a valued client, or anticipating a tennis match against a vaunted rival are but a few examples of common situations that are likely to evoke simulations of alternative possible outcomes. We presently examine self-esteem as a moderator of metal simulations and temporal confidence changes, and we test whether changes in confidence can be

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Address correspondence and reprint requests to Lawrence J. Sanna, Department of Psychology, P.O. Box 644820, Washington State University, Pullman, Washington, 99164-4820. E-mail: sanna@wsu.edu.

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accounted for by differing construals of mental simulations based on contrast and assimilation. People experience a decrease in subjective confidence as they approach the ''moment of truth.'' Nisan's (1972, 1973) participants were told they would be taking an aptitude test either immediately or in 4 weeks. Participants who thought they would be taking the test immediately were less confident that they could correctly answer a random item from the test than were those who thought they would be taking the test 4 weeks later. Gilovich, Kerr, and Medvec (1993) found that confidence on numerous tasks dropped markedly as the time to perform drew near; for example, students were less confident that they would perform well on a mid-term exam on exam day than they were on the first day of class, and similar results were obtained when predicting performances on a variety of laboratory tasks (e.g., memory tasks). Shepperd, Ouellette, and Fernandez (1996) analogously found that students were more confident in their success when providing estimates 1 month before an exam than when an exam was more proximal; in another study, only college seniors (as opposed to sophomores and juniors) became muted in their estimated likely first-job salaries because for seniors the prospect of trying to obtain a job was more immediate.

Mental Simulations, Affect, and Confidence

One recent account of temporal confidence changes is based on the reciprocal relations between mental simulations and affect (Sanna, 1999). This model proposes that affect can serve as both cause and consequence of simulations (Sanna, 1998; Sanna, Meier, & Turley-Ames, 1998; Sanna, Turley-Ames, & Meier, 1999). There are several reasons why these relations may explain confidence changes. First, prefactual thoughts of ''what may be'' indicate that upward simulations (e.g., ''If only I had more study time, I could do better on tomorrow's exam'') are preparative but elicit bad moods, whereas downward prefactuals (e.g., ''At least I bought the study guide, or my grade on tomorrow's exam might be worse'') elicit good moods but are not preparative (Sanna, 1998; see Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994; Sanna, 1996; for related arguments). As performance gets closer, it is likely that people would have more preparative thoughts. More precisely, a person may think more about everything that still requires doing, as well as about things that may never get completed. These thoughts about better realities may result in decreased confidence. Second, moods can serve as antecedents to simulation direction; negative affect elicits upward simulations, whereas positive affect elicits downward simulations. The negative affect may result from direct mood manipulations (Sanna, 1998; Sanna et al., 1999), from anxiety over ''gearing up'' to perform (Savitsky, Medvec, Charlton, & Gilovich, 1998), or from the upward simulations themselves (Sanna, 1996). This can result in decreased confidence as performances ap-

proach. Third, people may use upward simulations to ''buffer'' from potential failure (Shepperd et al., 1996; Taylor & Shepperd, 1998) as performances draw near, and upward simulations allow one to do this by thinking ''I knew it all along'' (Sanna, 1996). In short, increases in upward simulations, increases in negative affect and anxiety, or both (given the reciprocal relations these two variables) may be responsible for temporal changes in subjective confidence.

Self-Esteem, Self-Protective Mental Simulations, and Confidence

The relations between mental simulations and confidence, however, may be clarified further by considering participants' self-esteem. Examining self-esteem differences may also help to inform the nature of the motives underlying mental simulations. There is some related, though at best indirect, evidence for the present hypotheses. Although prospective simulations were not tested or associated with confidence changes, other findings indicate that high self-esteem (HSE) and low self-esteem (LSE) persons differ in their use of mental simulations (Sanna et al., 1998, 1999); this research has shown that HSE persons use downward simulations more often to repair moods after performing than do LSE persons. Mood repair can be classified as one self-enhancement motive; however, another self-enhancement motive is self-protection (Sedikides & Strube, 1997). On the one hand, thinking about how things might be even worse, as with downward simulations after negative events or when in bad moods, may allow people to feel good by comparison, and self-enhancement can be satisfied via mood repair in this fashion. On the other hand, self-enhancement can be satisfied alternatively via protecting the self from potential threats, a self-protection function (Sedikides & Strube, 1997). Self-protection may be accomplished effectively by thinking about upward mental simulations before performing. That is, upward simulations can allow one to think ''I knew all along what would happen,'' lessening the blow in case the worst actually does transpire. For example, much research indicates that negative outcomes are perceived as less unpleasant when they are expected than when they are unexpected (Feather, 1967, 1969).

Why might self-esteem be particularly relevant? There are several reasons. First, HSE and LSE person's differ in their coping styles (Blaine & Crocker, 1993; Brown, 1991; Shepperd & Arkin, 1990). Although HSE persons accept credit for success but deny blame for failures, LSE persons are more even handed in accepting responsibility for both good and bad outcomes (Brown & Mankowski, 1993). In short, HSE persons use an acquisitive style aimed more at gaining approval, whereas LSE persons use a protective style aimed more at avoiding disapproval and defending identity (Arkin, 1981; Arkin & Shepperd, 1989). The greater concern with self-protection among LSE persons suggests that they may be more likely than HSE persons to

lower confidence as performance nears. Increasing upward mental simulations may be used in the service of this self-protection motive, as described previously. Second, LSE persons may also have lesser self-certainty than HSE persons (Campbell, 1990; Pelham, 1991), resulting in greater reactivity to external feedback. This may also lead LSE persons to adopt a more pessimistic outlook, at least in part by generating greater numbers of upward mental simulations as the time to perform draws closer, buffering themselves in case failure actually transpires. For example, Blaine and Crocker (1993) have argued that effective coping by LSE persons involves recognizing potential future negative outcomes and preparing preemptively for failure. Each of these proposals suggests that LSE persons may be more likely than HSE persons to lower confidence estimates and that they may increase upward simulations as one means to accomplish this, as performance approaches.

Two studies were conducted to test these possibilities. In Study 1, we examined whether the relationships between mental simulations and temporal confidence changes would be moderated further by participants' level of self-esteem. In Study 2, we examined more closely whether HSE and LSE persons differ in how they construe mental simulations and whether this could suggest a mechanism for changes in confidence between the two groups.

STUDY 1

Research has shown that upward mental simulations and negative affect increase, and subjective confidence decreases, as performance draws closer (Sanna, 1999). However, this research did not examine self-esteem as a potential moderating variable. In contrast, Shepperd et al. (1996) provided some evidence that self-esteem can moderate temporal confidence changes. However, this research did not examine the possible differing mental simulations among the two groups. Study 1 was thus designed as an elaboration and extension of Sanna's and Shepperd et al.'s research, testing the potential role of mental simulations in producing temporal confidence changes among HSE and LSE persons. Such a strategy can serve to further an understanding of both mental simulations and the motives underlying self-esteem, which was our first order of business. Students estimated their exam scores once on the first day of class and once on the day of the exam (Gilovich et al., 1993; Shepperd et al., 1996). If people lower confidence estimates in an attempt to regulate affect, then due to greater concern with self-protection and lesser self-certainty, LSE persons may be more inclined to do so than their HSE counterparts. Lower confidence ratings and increased upward mental simulations and worse moods should be observed on exam day in comparison the first day of class for LSE persons. High-self-esteem persons may not exhibit such a pattern.

Method

Participants

Participants were 23 female and 17 male students enrolled in an introductory psychology course who received extra credit. Approximately equal proportions of females and males were distributed among HSE and LSE groups.

Self-Esteem

Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The RSES is a widely used and well-validated measure of global self-worth. It consists of 10 items (e.g., ''I take a positive view of myself''; ''All in all, I am inclined to think I am a failure''), which are answered on 4-point scales (0 = *strongly disagree;* 3 = *strongly agree*). After reverse scoring 5 items, a self-esteem score is computed by summing the 10 items (Brown & Mankowski, 1993). Consistent with research most closely related to the present study (Sanna et al., 1999; Shepperd et al., 1993), 22 HSE (M = 25.88) and 18 LSE (M = 16.50) participants were classified from the upper and lower thirds of RSES scores.

Procedure

Ratings were completed on the first day of class (3 weeks before the exam) and on exam day (but before the exam was taken). First day of class measures were made during the regular class session; for exam-day ratings, HSE and LSE participants were phoned and scheduled to meet in a nearby classroom before the exam to complete the measures.[1]

Confidence. Students had been told that their exam would be worth 100 points and that ''traditional'' cut-offs would be used (e.g., 90% and above for an A, etc.). Students provided confidence ratings (see Shepperd et al., 1996) by indicating on an 11-point scale ranging from 0 to 100% their predicted percentile performance. In addition, students estimated their confidence on two additional questions by estimating their performances (anchored by *very poorly* and *very well*) and by predicting how confident they were that they would be successful (anchored by *not confident* and *very confident*), each on 11-point scales.

Affect. Students indicated the extent to which a series of positive and negative adjectives reflected how they felt about their forthcoming performance (cf. Sanna, 1997, 1998; Sanna et al., 1999). Positive adjectives were *happy, satisfied, pleased, delighted,* and *good;* negative adjectives were *gloomy, depressed, anxious, nervous,* and *bad.* Each adjective was rated on an 11-point scale anchored by 1 (*not at all*) and 11 (*very much*).

Mental simulations. Mental simulations were solicited in a manner used successfully in prior research (Sanna, 1996, 1998, 1999), in which an open-ended format allowed students to write about any antecedents or consequences that they could think of and to record as many mental simulations as they desired. After a description of ''if only'' and ''at least'' thoughts, students listed alternatives that were better (e.g., ''If only I didn't put off buying the book, I

[1] This was necessary due to class-scheduling conflicts and a concern by the instructor that students have enough time to complete the exam. Class sessions were 50-min during the semester in which Study 1 was conducted. On the first day of class, the instructor essentially described the course outline and objectives, which left plenty of time for students to complete the ratings. On exam day, however, there was an understandable concern that all students be allowed the full class period to complete the exam. There also was another course using the room prior to the meeting time of introductory psychology. Fortunately, there was an available classroom very close by. The HSE and LSE students were randomly selected and phoned to report to this nearby classroom just prior to the exam to complete the exam-day measures.

TABLE 1
Mean Confidence, Affect, and Simulation Direction by Self-Esteem and Time for Study 1

Self-esteem	Time	
	3 weeks prior	Exam day
High		
Confidence	7.48	8.01
Affect	4.60	4.11
UMS	2.29	2.36
DMS	1.21	1.11
Low		
Confidence	7.53	6.03
Affect	4.52	8.23
UMS	2.30	4.01
DMS	1.42	0.98

Note. UMS, upward mental simulations; DMS, downward mental simulations.

think I could do better on the exam'') or worse (e.g., ''At least I'm studying hard this semester, or I know I'd do pretty crappy on the test'') than they expected would actually happen which might affect their upcoming performance. Students then went back over their statements and coded simulation direction by marking a plus sign beside statements that described things that were better (upward) and a minus sign beside statements that were worse (downward) than what they expected would actually happen (Sanna, 1996, 1998; Sanna & Turley, 1996).

Confidence, affect, and mental simulation measures were presented in a randomly predetermined order for each student and were interspersed among filler items.

Results and Discussion

Confidence

The three confidence measures at each time period were averaged (Cronbach's $\alpha = .87$ and .85, respectively) and used for analyses (all were 11-point scales). A 2 (self-esteem) $\times$ 2 (time) analysis of variance (ANOVA), with time as a within-subjects variable, revealed a self-esteem main effect, $F(1, 38) = 4.90$, $p < .05$, and a Self-Esteem $\times$ Time interaction, $F(1, 38) = 5.43$, $p < .03$ (see Table 1).[2] As predicted, planned contrasts (Rosenthal & Rosnow, 1985) indicated that LSE students were less confident on exam day than they were 3 weeks prior, $t(38) = 3.22$, $p < .01$; HSE students' confidence did not differ between the two time periods, $t(38) = 1.28$, $p = .21$. In addition, HSE and LSE students' confidence differed on exam day,

[2] Supplementary analyses included participants' sex as an additional variable for each of the measures used in Study 1. However, sex did not qualify any of our findings. The same was true for Study 2. Thus, sex of participants is not discussed further in this article.

$t(38) = 3.54$, $p < .01$, but not 3 weeks prior to the exam, $t(38) = 0.23$, $p = .82$.

Affect

The positive mood items were reverse scored and averaged with the negative-mood items for each time period (Cronbach's $\alpha = .84$ and .89, respectively). A 2 × 2 ANOVA, identical to that used for confidence, revealed a self-esteem main effect, $F(1, 38) = 4.50$, $p < .05$, and a Self-Esteem × Time interaction, $F(1, 38) = 4.87$, $p < .05$ (see Table 1).[3] As predicted, planned contrasts indicated that LSE students felt worse on exam day than they did 3 weeks prior, $t(38) = 3.32$, $p < .01$; HSE students' affect did not differ between the two time periods, $t(38) = 0.54$, $p = .62$. In addition, HSE and LSE students' affect differed on exam day, $t(38) = 3.87$, $p < .01$, but not at 3 weeks prior to the exam, $t(38) = 0.80$, $p = .83$.

Mental Simulations

A 2 × 2 × 2 (simulation: upward, downward) ANOVA, with time and simulation direction as within-subjects variables, revealed a main effect of time, $F(1, 38) = 33.74$, $p < .001$, Time × Simulation, $F(1, 38) = 5.60$, $p < .01$, and three-way, $F(1, 38) = 4.22$, $p < .05$, interactions (see Table 1). As predicted, for LSE students, planned contrasts indicated that the number of upward simulations increased on exam day in comparison to 3 weeks prior, $t(38) = 4.97$, $p < .01$; upward simulations did not differ across the two time periods for HSE students, $t(38) = 0.72$, $p = .58$. The HSE and LSE students' upward simulations differed on exam day, $t(38) = 5.22$, $p < .01$, but not at 3 weeks prior, $t(38) = 0.43$, $p = .88$. In no case did the number of downward simulations differ across time or self-esteem, $t(38)$s < 1.10, ps $> .39$.

Correlational Analyses

Is confidence related to mental simulations and affect? Correlations are presented in Table 2. On exam day, as predicted, confidence was negatively related to upward simulations and affect for LSE students; worse moods and more upward simulations were associated with decreased confidence. Also on exam day, affect was negatively related to confidence for HSE students. In contrast to LSE students, HSE students' upward simulations were *positively* related to confidence on exam day; more upward simulations were related

[3] Analyses of an average of just the *anxious* and *nervous* variables (cf. Savitsky et al., 1998) produced an identical pattern. Given that results were equivalent, only the 10-item affect measure is reported in this is article due to its greater correspondence to that used in research on which the present hypotheses are based (Sanna et al., 1998, 1999) and due to its likely greater reliability than a two-item measure. A similar analysis strategy was used in Study 2.

TABLE 2
Correlations between Variables and Confidence by Self-Esteem and Time for Study 1

	Time			
	3 weeks prior		Exam day	
Self-esteem	*r*	*p*	*r*	*p*
High				
Affect-Confidence	−.151	.500	−.429	.046
UMS-Confidence	−.311	.158	.468	.028
DMS-Confidence	.194	.385	−.064	.775
Low				
Affect-Confidence	−.369	.131	−.518	.028
UMS-Confidence	−.403	.097	−.620	.006
DMS-Confidence	.302	.223	.135	.592

Note. UMS, upward mental simulations; DMS, downward mental simulations.

to greater confidence. Most correlations 3 weeks prior to the exam were only marginal or merely approached significance. Downward mental simulations were not associated with confidence at either time point for either self-esteem group.

Study 1 elaborates and extends prior research (Sanna, 1999; Shepperd et al., 1996) by indicating that self-esteem moderates metal simulations and temporal confidence changes. As predicted, LSE students decreased confidence, felt worse, and generated more upward simulations on exam day. The HSE students did not. Upward simulations and negative affect were also associated with decreased confidence for HSE students. However, there was a positive relation between upward simulations and confidence for HSE students on exam day, suggesting that upward simulations may be utilized differently by the two self-esteem groups. Further evidence for this possibility comes from the fact that on exam day upward simulations was negatively associated with affect for LSE students, $r(16) = -.473$, $p < .05$, but upward simulations was positively associated with affect for HSE students, $r(18) = .452$, $p < .05$. This may suggest that particular strategies, involving differing construal and use of upward mental simulations, are responsible for distinct influences on confidence over time.

STUDY 2

A second study was conducted to test whether HSE and LSE persons differ in construal of mental simulations and whether this suggests a mechanism for diverging confidence of the two groups. Such a possibility is consistent with the data of Study 1. Additional, albeit somewhat indirect, evidence for

this proposal comes from two related areas, although neither addresses temporal confidence changes. In one, counterfactual researchers have shown that upward simulations do not necessarily lead to negative affect (Sanna, 1997). A focus on vividly imagined upward counterfactuals can lead to affective assimilation, and good moods (McMullen, 1997). In another, good moods can result from upward social comparisons among HSE persons. The HSE persons may construe upward targets as similar to themselves, resulting in assimilation effects; LSE persons may construe upward targets as dissimilar to themselves, resulting in contrast effects (Collins, 1996). We expanded on these notions and tested whether similar processes may explain confidence among HSE and LSE persons. High-self-esteem persons may assimilate upward simulations when performance is proximal, with no ensuing confidence changes; LSE persons may contrast upward simulations when performance is proximal, with ensuing lowered confidence. We manipulated whether participants assimilated or contrasted upward simulations in Study 2. Our focus was on only upward simulations because downward simulations were unrelated to confidence in Study 1 or in prior research (Sanna, 1999).

Method

Participants and Self-Esteem

Participants were 43 female and 37 male introductory psychology students who were recruited from the upper and lower thirds of the distribution on the RSES, which had been administered at the beginning of the semester as part of a mass screening. Forty HSE (M = 26.10) and 40 LSE (M = 16.82) participants, with approximately equal proportions of men and women, were randomly assigned to experimental conditions.

Procedure

Participants arrived at the laboratory and were tested individually. Study 2 was conceptually similar to Study 1, except that we experimentally manipulated participants' mental simulations. We also employed different tasks, to increase the generality of our research, and a between-subjects design. The study was run at the beginning of the semester and the experimenter who tested participants was unaware of their self-esteem level.

Tasks. Participants estimated their performances on a pair of laboratory tasks (Gilovich et al., 1993; Savitsky et al., 1998). A first task was described as a ''memory task,'' in which participants would be shown a series of 30 nonsense syllables for 5 s each and, after a 2-min retention interval, they were told they would be asked to recall as many as they could. For the second, ''anagram task,'' participants were told they would be given 30 anagrams and that they would have 6 min to unscramble as many as they could.[4]

[4] Separate analyses of the memory and anagram tasks revealed an identical pattern of results. Thus, to avoid redundancies and for simplicity of exposition, confidence, and affect ratings for the two tasks were averaged and used in analyses reported in this article.

Temporal conditions. Four conditions were used. In the *delayed* condition, participants were told that preliminary thoughts about the tasks were being collected at the session, but that they would actually perform the tasks later during that semester; in the *immediate-control* condition, participants were told that they would perform the tasks during that experimental session (Gilovich et al., 1993). Two other immediate conditions were added. In the immediate, *upward-assimilation* condition, participants were provided a series of upward simulations and were asked to focus on vividly imagining them; in the immediate, *upward-contrast* condition, participants were provided the same statements but were asked to think about their current feelings in comparison to these statements (cf. McMullen, 1997).

A series of 10 statements described thoughts about alternatives that were upward in direction; a set was constructed for each task (e.g., ''If I were prepared, I might score higher on the anagram task''; ''I will do better than a number of people on the memory task''). These were designed to lead participants through the types of thoughts that may occur typically as performance nears. Similar statements have been used to manipulate preperformance thoughts in previous research (Sanna, 1996). The statements were patterned after those provided by participants in earlier research (Sanna, 1997, 1999; Sanna & Turley, 1996) and by participants in Study 1. Each statement was presented on a separate page, and participants were asked to think about each one for 30 s (Sanna, 1999) before moving to the next one.

Participants were explicitly instructed to assimilate or contrast the statements. Modifying methods used previously (see McMullen, 1997), upward-assimilation participants were instructed to ''. . . focus on vividly imagining these statements as if they actually happened. . .''; upward-contrast participants were instructed to ''. . . focus on your current feelings in comparison to these statements, as if they did not happen . . .'' Thus, the focus of assimilation participants was on the statements happening, whereas the focus of contrast participants was on their current feelings in comparison to the statements (McMullen, 1997).

Confidence and affect. Three confidence questions were identical to Study 1, except that the percentile estimate was made with reference to all students who performed the tasks. The affect measures were identical to Study 1.

Results and Discussion

Data were analyzed using 2 (self-esteem) × 4 (condition: delayed, immediate-control, upward-assimilation, upward-contrast) ANOVAs. Where appropriate, focused contrasts (Rosenthal & Rosnow, 1985) were used to compare means.

Confidence

The three confidence questions were averaged (Cronbach's $\alpha = .86$) and used for analyses. There were main effects for self-esteem, $F(1, 72) = 5.55$, $p < .05$, and condition, $F(3, 72) = 14.91$, $p < .01$, qualified by a Self-Esteem × Condition interaction, $F(3, 72) = 4.27$, $p < .01$ (see Table 3). Within self-esteem, HSE participants in the upward-contrast cell expressed lower confidence than in the other three HSE cells, $t(72) = 2.99$, $p < .01$, but the other three cells did not differ from each other. For LSE participants, lower confidence was expressed in the immediate-control and upward-contrast cells than in the two remaining LSE cells, $t(72) = 2.68$, $p < .05$, but there were no other differences. Between self-esteem comparisons indicated

TABLE 3
Means and Correlations by Self-Esteem and Temporal Condition for Study 2

Self-esteem	Delayed	Immediate		
		Control	UMS Assimilation	UMS Contrast
High				
Confidence (C)	7.57	7.68	7.75	6.32
Affect (A)	4.62	4.50	4.00	8.03
r(C-A)	−.513*	−.677**	−.743**	−.683**
Low				
Confidence (C)	7.70	6.21	7.60	6.17
Affect (A)	4.84	8.51	4.49	8.62
r(C-A)	−.539*	−.711**	−.724**	−.659**

Note. UMS, upward mental simulations.
* $p < .15$.
** $p < .05$.

that the HSE and LSE upward-contrast and LSE immediate-control cells differed from all others, $t(72) = 2.31$, $p < .05$, but that there were no other differences.

Affect

An ANOVA on averaged affect (Cronbach's $\alpha = .85$) revealed a pattern similar to that of confidence: Self-esteem, $F(1, 72) = 7.04$, $p < .01$; condition, $F(3, 72) = 13.65$, $p < .01$; Self-Esteem × Condition, $F(3, 72) = 3.22$, $p < .05$ (see Table 3). Within self-esteem, HSE participants felt worse in the upward-contrast cell than in the other three HSE cells, $t(72) = 3.41$, $p < .01$, but the other three cells did not differ from each other. The LSE participants felt worse in the immediate-control and upward-contrast cells than in the two remaining LSE cells, $t(72) = 3.64$, $p < .01$, but there were no other differences. Between-self-esteem comparisons indicated that the HSE and LSE upward-contrast and LSE immediate-control cells differed from all others, $t(72) = 2.55$, $p < .05$, but that there were no other differences.

Correlational analyses

Correlations between confidence and affect within each cell are presented in Table 3. Confidence and affect are significantly related in all cells except for the delayed cells, but even here the correlations approached significance. As confidence increases, negative affect decreases, or vice versa.

Study 2 thus provides additional evidence that the relations between up-

ward simulations and confidence are moderated by self-esteem, in this case when those simulations are manipulated directly. Moreover, when performance was immediate, LSE participants who assimilated upward simulations behaved like HSE control participants, while HSE participants who contrasted upward simulations behaved like LSE control participants, suggesting that a mechanism involving differing construals of upward simulations may be responsible for confidence changes among the two groups. A different performance setting was also used in Study 2, which increases further the generality of the research.

GENERAL DISCUSSION

The two studies reported in this article elaborate and extend prior research and have implications for mental simulations, self-esteem, and construal processes. Data were obtained with naturally occurring (Study 1) and directly manipulated mental simulations (Study 2), in a real-life testing situation (Study 1) and controlled laboratory setting (Study 2), and with within-subjects (Study 1) and between-subjects (Study 2) designs.

Explanations for Temporal Confidence Changes

Several explanations for temporal confidence changes have been suggested. One candidate that people are overly optimistic (cf. Buehler, Griffin, & Ross, 1994) in the amount of preparation they will accomplish during the intervening time. For example, at a distance, a student anticipating an imminent exam may plan to do all of the readings, complete all required assignments, scrupulously inspect the study guide, and so on. At exam time, however, many of these plans remain unmet. People may increase preparative thoughts as a performance nears, and any unrealized plans may increase upward simulations even further—thoughts about ‘‘best laid plans’’ remaining unfulfilled. A second candidate is that people may try to buffer themselves from potential negative outcomes (Shepperd et al., 1996; Taylor & Shepperd, 1998); upward simulations do this by allowing one to think ‘‘ I knew it all along’’ (Sanna, 1996). That is, if failure does occur, a person has already preemptively braced for the worst. Adding to this, greater accountability (Tetlock, 1992) may be experienced when a task is proximal (e.g., facing up to actual abilities is now close at hand), and this may magnify attempts to brace for failure or make accessible negative thoughts in general (Gilovich et al., 1993) or upward mental simulations in particular (Sanna, 1999). Our view is that these perspectives are not incompatible. In fact, an account based on the reciprocal relations between mental simulations and affect may begin to coalesce many of these previous hypotheses in an integrative way.

Self-Esteem, Self-Motives, and Construal Processes

The relation between personality characteristics and temporal changes in confidence had to this point received little attention. However, assessing individual differences as moderators of temporal confidence changes is important not only because it may help an understanding of the tested characteristics, but also because it may help to identify processes in mental simulations more generally. Research had found that upward simulations and negative affect increase, and subjective confidence decreases, as performance draws closer (Sanna, 1999), but it did not examine self-esteem as a potential moderator. Other research had found that self-esteem may regulate confidence changes (Shepperd et al., 1996), but it did not examine possible divergent mental simulations. However, by combining the two paradigms both areas are informed. This strategy produced evidence that HSE and LSE persons may use mental simulations differently, suggesting that a mechanism involving differing construals of upward simulations may be responsible for confidence changes. Self-esteem may be particularly relevant as HSE and LSE persons differ in their coping styles (Blaine & Crocker, 1993; Brown, 1991; Campbell, 1990), and our research expands on these notions. The HSE person's acquisitive style is aimed more at gaining approval, whereas the LSE person's protective style is aimed more at avoiding disapproval and defending identity (Arkin, 1981; Arkin & Shepperd, 1989). Differing mental simulations may be used in support of each motive.

It is here that the present research may have especially intriguing implications. When combined with past research indicating that HSE persons use mental simulations more in the service of self-enhancing mood repair after performing (Sanna et al., 1998, 1999), the present research indicates that LSE persons use mental simulations more in the service of self-protection before performing. Although several motives likely have relevance to mental simulations, research has thus far centered on self-improvement and self-enhancement (Markman et al., 1993; Taylor & Schneider, 1989). It had been generally regarded that upward simulations served only self-improvement. Thinking about how things might be better can help in planning to actually obtain superior outcomes. Self-enhancement was assumed to be served primarily by downward simulations. However, self-enhancement may be more complex. General motives for self-enhancement emphasize affect-regulation and people's desire to maintain, restore, or *protect* a favorable sense of self (Sedikides & Strube, 1997). On the one hand, self-enhancement in the form of mood repair can certainly be served by generating downward simulations (Sanna et al., 1998, 1999). On the other hand, self-enhancement in the form of self-protection can also be served by *upward* simulations, as indicated in the present studies. Thus, either downward or upward simulations can be self-enhancing, and the timing of mental simula-

tions combined with various individual differences may hold the key in furthering an understanding of why. Future research examining the effects of differing motives on prospective and retrospective mental simulations may be particularly valuable.[5]

Finally, HSE and LSE persons may differ in construal of mental simulations and this may be one mechanism driving confidence changes. Although the number of simulations did not change over time, there was a positive relation between upward simulations and confidence on exam day for HSE persons; there was a negative relation between upward simulations and confidence on exam day for LSE persons (Study 1). When the task was immediate, LSE persons who assimilated upward simulations behaved like HSE persons, and HSE persons who contrasted upward simulations behaved like LSE persons (Study 2). Assimilating upward simulations seems to mimic what HSE persons do naturally as performance nears, but contrasting upward simulations mimics LSE persons. Both groups focused on upward simulations, but assimilating versus contrasting them (McMullen, 1997) produced differing effects on confidence, which varied by self-esteem. These results are consistent with proposals that HSE persons construe upward targets as similar, resulting in assimilation, whereas LSE persons construe upward targets as dissimilar, resulting in contrast (Collins, 1996; see also Schwarz & Bless, 1992). They are also consistent with findings that upward simulations may not always have deleterious effects (Sanna, 1997). However, our research goes beyond previous theorizing by testing whether such processes may explain confidence changes, expanding these notions to a context outside that in which they were proposed. We end by acknowledging explicitly that temporal confidence changes is likely multiply determined, and we do not wish to argue that mental simulations, affect, and self-esteem are the only influences. However, a strong attempt was made to integrate existing findings and to fit the present findings into a broader context. We also acknowledge that it is not only the number or frequency of mental simulations which may matter, but it also may be the intensity of such thoughts (Sanna & Turley-Ames, in press). It is up to future research, of course, to test further these possibilities. We hope that the present research not only may extend what is known about temporal confidence changes, but that relating changes in confidence to self-esteem may elucidate further the motives underlying this individual difference.

[5] A related future issue is testing possible relations among various personality characteristics. For example, defensive pessimists and optimists (Norem & Cantor, 1986) also use mental simulations differently (Sanna, 1996, 1998). Although well beyond the scope of this article, we suspect that both similarities and differences will be found. In fact, it is particularly intriguing to speculate that focusing on mental simulations may itself help to inform the nature of distinguishing processes underlying a multitude of individual differences.

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